CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes (1) the existing condition of the environment that could be affected by implementing the Proposed Action and (2) the known and predicted effects on the existing environment that could result from the construction, operation, and maintenance of the proposed 500kV transmission line and associated facilities.

3.1.1 Affected Environment

In accordance with NEPA regulations codified at 40 CFR 1502.15, this section presents a summary of the existing condition of the human and natural environment in the areas that could be affected by the Proposed Action. This information serves as a baseline from which the impacts anticipated to result from implementing the proposed Project were assessed. The affected environment is characterized for the following resources, land uses, social and economic conditions, and public health and safety.

- Climate and Air Quality
- Earth Resources
  - Geologic Hazards
  - Soil Resources
  - Mineral Resources
- Paleontological Resources
- Water Resources
- Biological Resources
  - Vegetation
  - Special Status Plants
  - Wildlife
  - Special Status Wildlife
  - Fish and Aquatic Resources
- Land Use
- Parks, Preservation, and Recreation
- Transportation and Access
- Special Designations and Other Management Areas
- Wilderness Areas, Wilderness Study Areas, and Non-wilderness Study Area Lands with Wilderness Characteristics
- Inventoried Roadless Areas and Unroaded/Undeveloped Areas
- Visual Resources
- National Trails System
- Cultural Resources
- Fire Ecology and Management
- Social and Economic Conditions
  - Environmental Justice
- Public Health and Safety
  - Noise
  - Electric and Magnetic Fields

These topics were selected based on federal regulatory requirements and policies, concerns of the lead and cooperating agencies, and/or issues derived from comments expressed by agencies and the public during scoping. Issues raised by the public and agencies during scoping are presented in Table 1-1. Key issue areas (i.e., areas where issues raised during scoping were identified on the ground) were identified based on the resource inventory data and though collaboration with the Agency Interdisciplinary Team during preparation of the EIS and are presented in Map 3-1.

3.1.2 Environmental Consequences

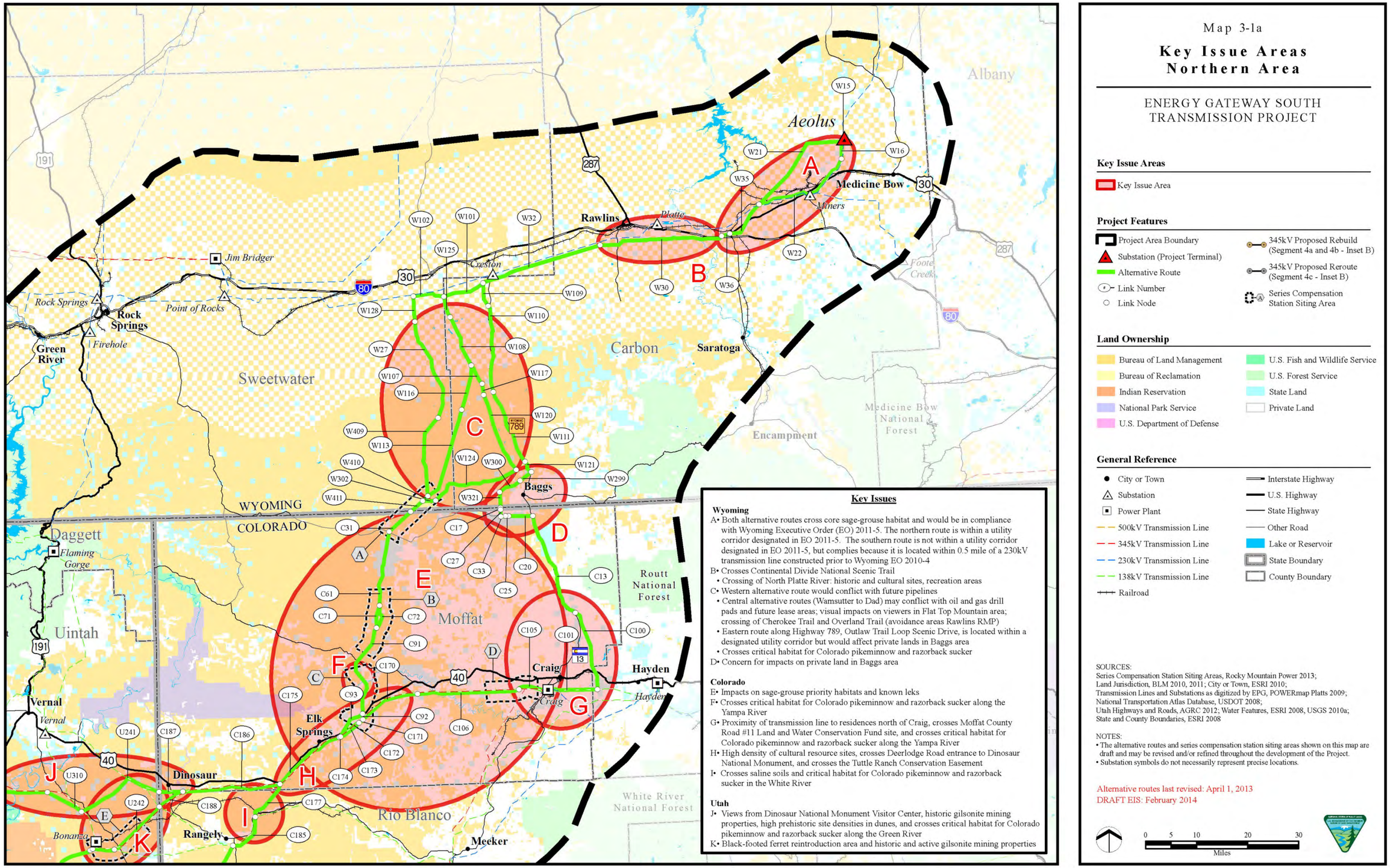
The analysis of potential environmental effects predicts how a resource would be affected and the degree of change (impact) that could result from implementation of an action. Potential environmental effects on each resource were determined through a systematic analysis that included assessing the impacts of each alternative route on the environment and how the impacts could be mitigated most effectively. An overview of the methodology for this analysis is presented in Section 2.5.1, and described for each resource in Section 3.2.

3.2 Resources Analyzed

This section describes the affected environment and known and predicted effects of implementing the Project on resources relevant to the issues and concerns identified during agency and public scoping. The affected environment and effects analysis area were assessed for each alternative route. Generally, each resource discussion is organized as follows:

- **Introduction and Regulatory Framework**. A description of the resource and the laws, regulations, and policies related or relevant to management or analysis of the resource
- **Issues Identified for Analysis**. A description of the issues identified for each resource that were analyzed for the Project.
- **Regional Setting.** A brief description of the region likely to be affected by implementation of the Project
- **Study Methodology**. Resource-specific methods used to assess the affected environment and initial and residual environmental effects for each alternative route
- **Results by Alternative Route**
  - Affected Environment
  - Environmental Consequences

A summary of baseline resource inventory and results of the effects analysis is presented in each resource section. Tables S-16a to S-16d present a comparison of results of the effects analysis for the alternative routes, Table S-2 presents a summary of engineering issues, and Table S-3 presents a summary of the estimated ground disturbance and access roads.


Map 3-1a
Key Issue Areas
Northern Area
ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT
Key Issue Areas
Key Issue Area
Project Features
Project Area Boundary
Substation (Project Terminal)
Alternative Route
Link Number
Link Node
345kV Proposed Rebuild (Segment 4a and 4b - Inset B)
345kV Proposed Reroute (Segment 4c - Inset B)
Series Compensation Station Siting Area
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
National Park Service
U.S. Department of Defense
U.S. Fish and Wildlife Service
U.S. Forest Service
State Land
Private Land
General Reference
City or Town
Substation
Power Plant
500kV Transmission Line
345kV Transmission Line
230kV Transmission Line
138kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Other Road
Lake or Reservoir
State Boundary
County Boundary
SOURCES:
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008
NOTES:
• The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.
Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014
0 5 10 20 30
Miles
Key Issues
Wyoming
A• Both alternative routes cross core sage-grouse habitat and would be in compliance with Wyoming Executive Order (EO) 2011-5. The northern route is within a utility corridor designated in EO 2011-5. The southern route is not within a utility corridor designated in EO 2011-5, but complies because it is located within 0.5 mile of a 230kV transmission line constructed prior to Wyoming EO 2010-4
B• Crosses Continental Divide National Scenic Trail
• Crossing of North Platte River: historic and cultural sites, recreation areas
C• Western alternative route would conflict with future pipelines
• Central alternative routes (Wamsutter to Dad) may conflict with oil and gas drill pads and future lease areas; visual impacts on viewers in Flat Top Mountain area; crossing of Cherokee Trail and Overland Trail (avoidance areas Rawlins RMP)
• Eastern route along Highway 789, Outlaw Trail Loop Scenic Drive, is located within a designated utility corridor but would affect private lands in Baggs area
• Crosses critical habitat for Colorado pikeminnow and razorback sucker
D• Concern for impacts on private land in Baggs area
Colorado
E• Impacts on sage-grouse priority habitats and known leks
F• Crosses critical habitat for Colorado pikeminnow and razorback sucker along the Yampa River
G• Proximity of transmission line to residences north of Craig, crosses Moffat County Road #11 Land and Water Conservation Fund site, and crosses critical habitat for Colorado pikeminnow and razorback sucker along the Yampa River
H• High density of cultural resource sites, crosses Deerlodge Road entrance to Dinosaur National Monument, and crosses the Tuttle Ranch Conservation Easement
I• Crosses saline soils and critical habitat for Colorado pikeminnow and razorback sucker in the White River
Utah
J• Views from Dinosaur National Monument Visitor Center, historic gilsonite mining properties, high prehistoric site densities in dunes, and crosses critical habitat for Colorado pikeminnow and razorback sucker along the Green River
K• Black-footed ferret reintroduction area and historic and active gilsonite mining properties
Albany
Aeolus
Medicine Bow
Miners
Rawlins
Platte
Creston
Jim Bridger
Rock Springs
Rock Springs
Point of Rocks
Green River
Firehole
Sweetwater
Carbon
Saratoga
Foote Creek
Medicine Bow National Forest
Encampment
Baggs
WYOMING
COLORADO
Daggett
Flaming Gorge
Uintah
Routt National Forest
Moffat
Craig
Hayden
Vernal
Elk Springs
Dinosaur
Rio Blanco
White River National Forest
Rangely
Meeker
Bonanza
A
B
C
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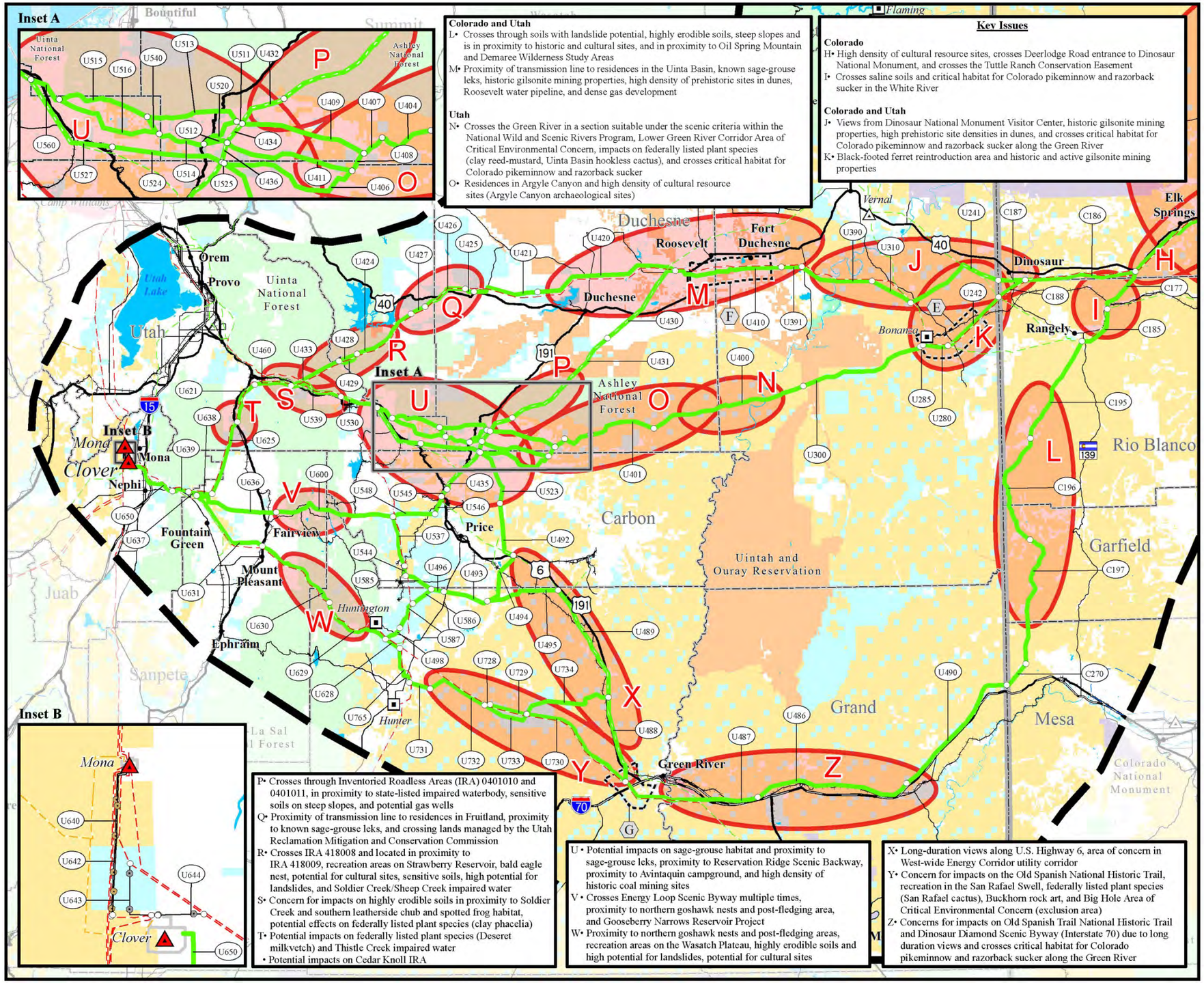
F
G
H
I
J
K



Map 3-1b

Key Issue Areas Southern Area

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Key Issue Areas

- Key Issue Area

Project Features

- Project Area Boundary
- Substation (Project Terminal)
- Alternative Route
- Link Number
- Link Node
- 345kV Proposed Rebuild (Segment 4a and 4b - Inset B)
- 345kV Proposed Reroute (Segment 4c - Inset B)
- Series Compensation Station Siting Area

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference

- City or Town
- Substation
- Power Plant
- 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- 138kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Other Road
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008

NOTES:
• The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014

0 5 10 20 30
Miles

3.2.1 Climate and Air Quality

3.2.1.1 Introduction and Regulatory Framework

3.2.1.1.1 Introduction

Air quality is a concern in much of the Rocky Mountain West and this section describes the air quality conditions existing in the portions of Wyoming, Colorado, and Utah traversed by the proposed Project, including the types of pollutants emitted and regulations that would apply to construction and operation of the proposed transmission line and series compensation stations. In Section 3.2.1.5, the expected air pollutant emissions from transmission line and series compensation station construction, and from certain sources during series compensation station operation, are quantified to the extent possible. Potential impacts (ground-level pollutant concentrations) are discussed and quantified for the most substantial emission sources and activities, and are compared with state and federal ambient concentration standards.

This section also addresses climate parameters that describe the current weather patterns common to the region. These provide a baseline against which potential long-term climate change trends may be measured. Greenhouse gas (GHG) emissions from the project activities that may contribute to climate change are also quantified and discussed in Section 3.2.1.5.

3.2.1.1.2 Regulatory Framework

Federal Air Quality Regulations and Standards

Responsibility for administering and enforcing rules and regulations pertaining to air quality in the Project study area is shared between federal, state, tribal, and county jurisdictions. Regulations and standards to implement the requirements of the federal Clean Air Act are set by the EPA. While the EPA retains authority for certain air quality rules, including those pertaining to emission standards for mobile sources, many requirements are delegated to states and, in some cases, to tribal governments, which are treated in the same manner as states.

The EPA has set National Ambient Air Quality Standards (NAAQS) (Table 3-1) for air pollutants considered harmful to public health and the environment. Ambient standards regulate the amount of contaminants in the air due to all sources. Standards have been set for six pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone, lead, and particulate matter. There are two types of standards: primary standards set to protect public health and secondary standards set to protect public welfare, including damage to buildings, animals, and vegetation.

Both Wyoming and Colorado have set their own ambient standards for certain pollutants and averaging periods that apply only in those states. The Wyoming Ambient Air Quality Standards and Colorado Ambient Air Quality Standards are also shown in Table 3-1. Utah has not set state-level ambient standards.

Areas that do not meet the NAAQS are designated as nonattainment. Previously designated nonattainment areas that have since reached attainment are referred to as attainment areas with a maintenance plan (attainment/maintenance), or simply as maintenance areas. More stringent air quality regulations apply in these areas. Portions of the alternative routes that would traverse any nonattainment or maintenance area require a general conformity analysis (refer to Section 3.2.1.4.2). Areas that have insufficient air quality monitoring data to determine whether they are attaining the NAAQS are referred to as unclassifiable areas. Most of the areas traversed by the alternative routes are considered unclassifiable and are treated in federal and state regulations as attainment areas.

TABLE 3-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	National Ambient Air Quality Standards		Wyoming Ambient Air Quality Standards		Colorado Ambient Air Quality Standards
		Primary Standards	Secondary Standards	Primary Standards	Secondary Standards	
Carbon monoxide	8 hour	9 ppm (10 mg/m^3)(1)	–	9 ppm (10 mg/m^3)(1)		–
	1 hour	35 ppm (40 mg/m^3)(1)	–	35 ppm (40 mg/m^3)(1)		–
Nitrogen dioxide	Annual arithmetic mean	0.053 ppm (100 μg/m^3)(2)	Same as Primary	53 ppb (100 μg/m^3)(2)	–	—
	1 hour	100 ppb (188.7 μg/m^3)(3)	–	100 ppb (188.7 μg/m^3)(3)	–	—
Sulfur dioxide	3 hour	–	0.5 ppm (1,300 μg/m^3)(1)	–	0.5 ppm (1,300 μg/m^3)(4)	700 μg/m^3 (0.267 ppm)
	1 hour	75 ppb (196.4 μg/m^3)(5)	–	75 ppb (196.4 μg/m^3)(5)	–	–
Ozone	8 hour(6)	0.075 ppm	Same as Primary	0.075 ppm	Same as Primary	–
Lead	Rolling 3-month average(7)	0.15 μg/m^3	Same as Primary	0.15 μg/m^3	Same as Primary	–
PM_{10}	Annual arithmetic mean	–	–	50 μg/m^3		–
	24 hour	150 μg/m^3(8)	Same as Primary	150 μg/m^3(9)		–
$PM_{2.5}$	Annual arithmetic mean	12.0 μg/m^3(10)	15.0 μg/m^3(10)	15.0 μg/m^3(11)	Same as Primary	–
	24 hour	35 μg/m^3(12)	Same as Primary	35 μg/m^3(13)	Same as Primary	–
Hydrogen sulfide	0.5 hour	–	–	70 μg/m^3(14)		–
	0.5 hour	–	–	40 μg/m^3(15)		–
Suspended sulfates	Annual average	–	–	0.25 mg sulfur trioxide/100 cm^2/day(16)		–
	30-day	–	–	0.50 mg sulfur trioxide/100 cm^2/day(16)		–

TABLE 3-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	National Ambient Air Quality Standards		Wyoming Ambient Air Quality Standards		Colorado Ambient Air Quality Standards
		Primary Standards	Secondary Standards	Primary Standards	Secondary Standards	
Fluorides	30-day	–	–	0.4 μg/m$^{3(7)}$		–
	7-day	–	–	0.5 μg/m$^{3(7)}$		–
	24-hour	–	–	1.8 μg/m$^{3(7)}$		–
	12-hour	–	–	3.0 μg/m$^{3(7)}$		–

SOURCES: Colorado Department of Public Health and Environment 2013; Environmental Protection Agency 2013a; Wyoming Department of Environmental Quality 2013
NOTES:
[1]Not to be exceeded more than once per year.
[2]Standard is met when the annual arithmetic mean concentration in a calendar year is less than or equal to 0.053 ppm, rounded to three decimal places.
[3]To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb.
[4]Not to be exceeded more than once per calendar year, as determined from successive nonoverlapping 3-hour blocks starting at midnight each calendar day and rounded to one decimal place.
[5]To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.
[6]To attain this standard, the 3-year average of the fourth highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.
[7]Not to be exceeded.
[8]Not to be exceeded more than once per year, on average over 3 years.
[9]Not more than one expected exceedance per year.
[10]Annual arithmetic mean, averaged over 3 years.
[11]Annual arithmetic mean.
[12]98th percentile, averaged over 3 years.
[13]98th percentile 24-hour average concentration.
[14]Not to be exceeded more than two times per year.
[15]Not to be exceeded more than two times in any five consecutive days.
[16]Measured as a sulfation rate by the lead peroxide method.
cm^2 = Square centimeters
mg = Milligrams
mg/m^3 = Milligrams per cubic meter
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
ppm = Parts per million
ppb = Parts per billion
$\mu g/m^3$ = micrograms per cubic meter

Ambient air quality standards have not been established for hazardous air pollutants (HAP); instead, HAPs are regulated on an emission basis by the National Emission Standards for Hazardous Air Pollutants (NESHAP) and various state regulations. The NESHAP regulates emissions from specified emission units and source types.

The GHG emissions are regulated under federal requirements that include mandatory reporting and GHG emission permits for major sources. It is not expected that the types of sources that will be part of the Project would be subject to these rules.

Sensitive areas such as certain national parks and wilderness areas have been designated under the federal Clean Air Act as Class I areas for the Prevention of Significant Deterioration (PSD) program. Class I areas are areas that have special national or regional natural, scenic, recreational, or historic value for which federal regulations provide special protection with respect to air quality degradation.

Regional haze reduces long-range visibility over a wide region. Haze is caused by fine particles (and their precursors) that are so small they settle out only very slowly. In 1999, the EPA announced the Regional Haze Rule, which calls for state and federal agencies to work together to improve visibility in designated Class I areas. States are required to demonstrate reasonable progress towards the national visibility goal established in 1977 by the Clean Air Act, which is "the prevention of any future, and the remedying of any existing impairment of visibility in mandatory Class I federal areas which impairment results from man-made air pollution." The national goal is to restore natural visibility conditions in Class I areas by the year 2064.

The Western Regional Air Partnership is a voluntary partnership of states, tribes, federal land managers, local air agencies, and the EPA that was originally chartered to develop the technical and policy tools needed by western states and tribes to comply with the EPA's regional haze regulations. The organization was re-chartered in 2009. The new charter shifts the emphasis from policy work to technical work. It also shifts the focus from regional haze to a broader one-atmosphere, multi-pollutant approach to western air quality issues.

State Air Quality Regulations

Wyoming and Colorado state-level ambient air quality standards are shown in Table 3-1.

Wyoming, Colorado, and Utah air quality regulations implement many of the federal air quality requirements through EPA-approved State Implementation Plans (SIP). State air quality regulations also regulate sources and emission types that may not be covered by the federal regulations. Specific regulatory requirements that may apply to transmission line and substation construction and operation are discussed in Section 3.2.1.3.

The Wyoming Environmental Quality Act, Wyoming Statutes (Wyo. Stat.) 35-11-101 et seq., and the Wyoming Air Quality Standards and Regulations (WAQSR) govern air quality requirements in the state of Wyoming. In Colorado, Colorado Revised Statutes (C.R.S.), Title 25, Article 7 governs air quality issues for stationary sources, while C.R.S. Title 42, Article 4, Parts 3 and 4 govern vehicle emission inspection requirements. Implementing regulations (Colorado Air Quality Control Commission regulations) are codified at 5 Code of Colorado Regulations (CCR) 1001. The Utah Air Conservation Act, Title 19, Section 2, of the Utah State Code; the Clean Air Act of 1963; and implementing regulations for both statutes regulate air pollutant emissions within Utah. Regulations are codified at Utah Administrative Code (UAC), Title R307, Environmental Quality, Air quality.

3.2.1.2 Issues Identified for Analysis

3.2.1.2.1 Emissions from Construction

Emissions of the major regulated pollutants from construction of the transmission line and series compensation stations have been calculated. Emissions from construction sources such as traffic, construction equipment, fugitive dust from earthmoving, etc., are generally not subject to federal or state limitations; but in some cases do require mitigation (such as watering of disturbed areas) or are indirectly regulated through limitations imposed on the subject equipment itself (e.g., motor vehicle tailpipe standards or diesel engine performance standards). Due to the lack of any direct limitations with which to compare them, impacts on air quality are not determined based on project emissions in and of themselves.

3.2.1.2.2 Emissions During Operation

In general, emissions have not been quantified for the operation of the transmission line and series compensation stations, with the exception of GHG emissions from circuit breakers. During the operations phase, emissions would be limited primarily to vehicular use for routine maintenance and emergency repair activities. The sources would be similar to those from construction, but pollutants would be emitted in much smaller amounts on an annual basis; therefore, the majority of emissions and impacts would be associated with construction.

3.2.1.2.3 Ambient Air Pollutant Concentrations from Construction

In addition to tallying project emissions, a screening-level impact analysis has been performed using a dispersion model to predict ambient concentrations of pollutants for the project activities that have the most potential to exceed standards. Ambient levels of several project pollutants are limited by national and/or state ambient air quality standards (Table 3-1), which regulate concentrations of pollutants in the atmosphere from all sources of emissions. A significant impact on air quality would occur if ambient concentrations resulting from mitigated project emissions, when added to representative background concentrations of the subject pollutants from all other sources, exceed any national or state ambient air quality standard.

3.2.1.3 Regional Setting

3.2.1.3.1 Climate

Climate refers to the long-term average and range of weather conditions that prevail at any given place. Climatological "normal" conditions are defined as a 30-year average of weather, most often described in terms of temperature and precipitation. This section provides a state-by-state overview of the climate in the alternative route study corridors.

Wyoming's Climate

Wyoming's topography, including mountains and high plains, greatly influences the state's climate. Its mean elevation is about 6,700 feet above sea level, but the elevation ranges from 3,125 feet near the northeast corner of the state to 13,785 feet at Gannett Peak in the west-central portion of the state. The mountain ranges, which lie in a general north-south direction, are perpendicular to the prevailing westerly wind flow and provide effective barriers that force air moving in from the Pacific Ocean to rise and drop much of its moisture along the western slopes. Wyoming is considered semiarid east of the mountains. The topography and variations in elevation make it difficult to divide the state into homogeneous, climatological areas (Western Regional Climate Center [WRCC] 2013a).

Studies of wind flow patterns indicate that Wyoming is covered most of the time by air from the Pacific. A smaller percentage of time the state is covered by cold air masses that move down from Canada (WRCC 2013a).

The Continental Divide splits the state from near the northwest corner to the center of the southern border. The alternative route study corridors include areas to the east and west of the Continental Divide, as well as portions that would traverse the Great Divide Basin. There is no drainage from this Basin and precipitation, which averages only 7 to 10 inches annually, follows creek beds to ponds or small lakes where it either evaporates or percolates into the ground (WRCC 2013a).

Because of its elevation, Wyoming has a relatively cool climate. The warmest parts of the state are those with the lowest elevations. With increasing elevation, average temperatures drop rapidly. Summer nights are cool, even though daytime temperatures may be quite high at times. In the winter, it is characteristic to have rapid and frequent changes between mild and cold spells. The majority of cold waves move southward on the east side of the Divide. During warm spells in the winter, nighttime temperatures frequently remain above freezing. Chinooks, warm downslope winds, are common along the eastern slopes. The state has long winters and short growing seasons (WRCC 2013a).

Numerous valleys provide ideal pockets for the collection of cold air drainage at night. Protecting mountain ranges prevent the wind from stirring the air, and the colder, heavier air settles into the valleys, often sending temperatures well below zero. Such cold, stagnant conditions may lead to elevated air pollutant levels if sufficient emission sources are available in the air shed (WRCC 2013a).

For most of Wyoming, sunshine ranges from 60 percent of the possible amount during the winter to about 75 percent during the summer. Because the altitude provides less atmosphere for the sun's rays to penetrate and because of limited amounts of fog and haze, the intensity of sunshine is unusually high (WRCC 2013a).

Like other states in the west, precipitation varies a great deal from one location to another. The period of maximum precipitation occurs in the spring and early summer over most of Wyoming. Precipitation is greater over the mountain ranges and usually at the higher elevations. During the summer, showers are quite frequent but often amount to only a few hundredths of an inch. Occasionally, there will be some very heavy rain associated with localized thunderstorms (WRCC 2013a).

The average relative humidity is quite low. Low relative humidity, high percentage of sunshine, and rather high average winds all contribute to a high rate of evaporation (WRCC 2013a).

Hailstorms are the most destructive type of local storm and damage to crops and property from hail amounts to many thousands of dollars every year. Tornadoes occur, but they are much less frequent, smaller, have a shorter duration, and are less destructive than those that occur in the Midwest. Wyoming is quite windy and during the winter there are frequent periods when the wind reaches 30 to 40 miles per hour (mph) with gusts to 50 or 60 (WRCC 2013a).

Snow falls frequently from November through May and at lower elevations is light to moderate. Falls of 10 to 15 inches or more for a single storm occur but are infrequent outside of the mountains. Wind will frequently accompany or follow a snowstorm and pile the snow into drifts several feet deep. High winds and low temperatures with snow cause blizzard or near-blizzard conditions (WRCC 2013a).

Total annual snowfall varies considerably. At the lower elevations in the east, the range is from 60 to 70 inches. The mountains receive a great deal more and in the higher ranges annual amounts are more than 200 inches. Many of the streams fed by melting snow furnish ample quantities of water for irrigation,

electric power generation, and domestic use. Rapid run-off from heavy rain during thunderstorms may cause flash flooding (WRCC 2013a).

Nearly 4 percent of Wyoming is cultivated cropland, including both irrigated and nonirrigated. Another 13 percent is covered with forests, while parks and recreational areas take up about 4 percent. The majority of Wyoming is used for grazing and has a general appearance of dryness much of the time. The mountain areas provide timber and a storage place for the winter snows, which in the spring and summer feed lakes and reservoirs used in the irrigation districts. Principal crops in the irrigation districts are sugar beets, beans, potatoes, and hay. On the nonirrigated land, the principal crops are hay and grains, including wheat, barley, and oats (WRCC 2013a).

Table 3-2 shows the 30-year normal climate temperature and precipitation records for stations located along the alternative route study corridors in Wyoming (generally arranged from north to south and east to west). Map 3-2 shows the location of these climate stations.

TABLE 3-2
CLIMATE STATISTICS FOR WYOMING

Climate	Month												
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Medicine Bow, Wyoming (Latitude: 41.8978, Longitude: -106.2017, Elevation: 6,605 feet, 2,013.2 meters)													
Average Maximum Temperature	30.0	33.0	43.1	53.9	63.7	75.4	83.1	80.9	70.6	57.4	40.5	30.3	55.3
Average Minimum Temperature	9.6	10.9	17.7	24.7	33.7	42.8	47.4	45.6	35.7	26.8	17.2	10.2	26.9
Average Total Precipitation	0.30	0.57	0.79	1.26	1.73	1.45	1.02	0.83	1.08	0.88	0.64	0.46	11.01
Average Total Snowfall	5.5	7.0	8.0	5.7	2.3	0.0	0.0	0.0	1.1	4.0	6.4	6.8	46.8
Seminoe Dam, Wyoming (Latitude: 42.1569, Longitude: -106.9153, Elevation: 6,837.9 feet, 2,084.2 meters)													
Average Maximum Temperature	31.5	34.4	43.6	51.9	64.4	75.7	84.6	82.4	71.5	57.2	41.4	31.1	55.90
Average Minimum Temperature	14.6	13.9	23.0	29.6	37.6	47.0	54.7	52.2	43.3	33.8	23.2	15.0	32.4
Average Total Precipitation	0.49	0.75	1.2	1.73	2.1	1.55	0.97	0.72	1.27	1.17	1.2	0.83	13.98
Wamsutter, Wyoming (Latitude: 41.6667, Longitude: -107.9667, Elevation: 6,740.2 feet, 2,054.4 meters)													
Average Maximum Temperature	28.0	32.9	44.0	54.4	65.0	76.2	84.7	82.3	72.2	58.6	41.0	29.5	55.9
Average Minimum Temperature	6.9	9.2	19.6	26.1	34.2	43.0	49.8	47.9	38.8	28.8	17.0	8.4	27.6

TABLE 3-2 CLIMATE STATISTICS FOR WYOMING													
	Month												
Climate	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Average Total Precipitation	0.47	0.37	0.46	0.76	1.12	0.87	0.93	0.73	0.98	0.74	0.44	0.31	8.18
Average Total Snowfall	5.6	5.8	4.8	3.3	1.8	0.1	0.0	0.0	0.5	2.0	5.4	4.5	33.8
Baggs, Wyoming (Latitude: 41.0389, Longitude: -107.6575, Elevation: 6,240.2 feet, 1,902.0 meters)													
Average Maximum Temperature	31.8	35.4	46.9	57.8	67.6	78.4	85.8	82.9	73.3	59.9	43.5	32.2	58.1
Average Minimum Temperature	6.1	10.1	21.3	28.7	35.7	42.4	48.5	47.6	39.0	29.0	18.3	7.9	28.0
Average Total Precipitation	0.45	0.43	0.55	0.92	1.53	0.87	1.05	0.89	1.19	1.20	0.81	0.61	10.50
Average Total Snowfall	8.5	6.4	5.4	2.0	0.6	0.0	0.0	0.0	0.0	1.4	7.0	9.9	41.2

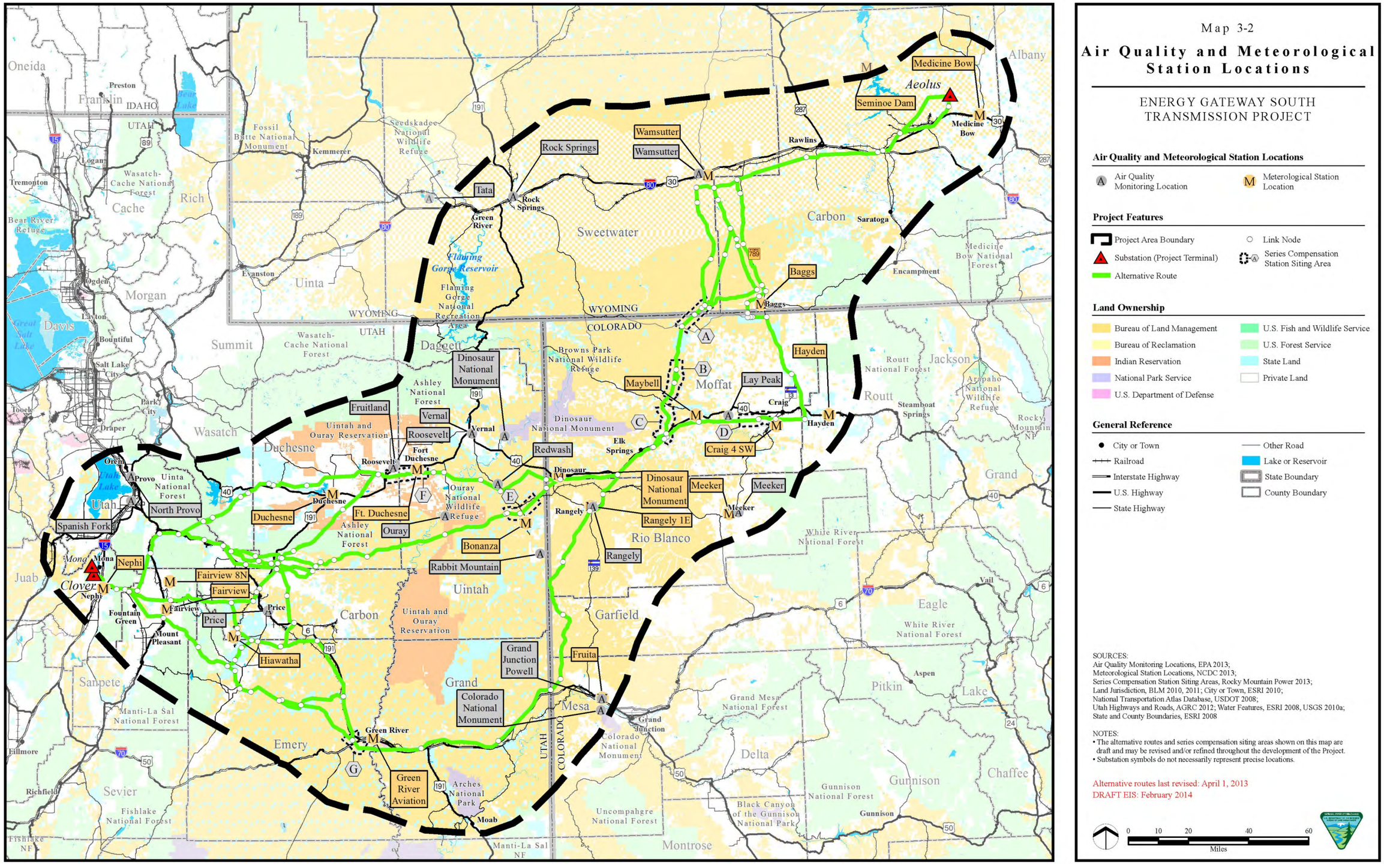
SOURCE: National Climatic Data Center 2013 (period of record: 1981 to 2010)
NOTE: Temperatures shown in degrees Fahrenheit. Precipitation and snowfall shown in inches.

Colorado's Climate

The principal features of the Colorado geography are its inland continental location in the middle latitudes and the mountains and ranges extending north and south through the approximate center of the state. Colorado lies astride the highest mountains of the Continental Divide. With an average altitude of about 6,800 feet above sea level, Colorado is the highest state. The alternative route study corridors are located to the west of the Continental Divide (WRCC2013b).

The high plains of Colorado slope gently upward for a distance of some 200 miles from the state's eastern border to the base of the foothills of the Rocky Mountains. The lowest point in the state at 3,350 feet is on the eastern border. Backing the foothills are the mountain ranges with the highest peaks greater than 14,000 feet. West of these "front ranges" are additional ranges, generally extending north and south. These ranges enclose numerous high mountain parks and valleys. Farther westward, the mountains give way to rugged plateau country in the form of high mesas (some more than 10,000 feet in elevation), which extends to the western border of the state. All rivers in Colorado rise within its borders and flow outward, with the exception of the Green River, which flows diagonally across the extreme northwestern corner of the state (WRCC 2013b).

Most of Colorado has a cool climate. During summer there are hot days in the plains, but these are often relieved by afternoon thundershowers. Mountain regions are nearly always cool. Humidity is generally quite low. The thin atmosphere allows greater penetration of solar radiation and results in pleasant daytime conditions even during winter (WRCC 2013b).


Map 3-2
Air Quality and Meteorological Station Locations
ENERGY GATEWAY SOUTH TRANSMISSION PROJECT
Air Quality and Meteorological Station Locations
Air Quality Monitoring Location
Meterological Station Location
Project Features
Project Area Boundary
Link Node
Substation (Project Terminal)
Series Compensation Station Siting Area
Alternative Route
Land Ownership
Bureau of Land Management
U.S. Fish and Wildlife Service
Bureau of Reclamation
U.S. Forest Service
Indian Reservation
State Land
National Park Service
Private Land
U.S. Department of Defense
General Reference
City or Town
Other Road
Railroad
Lake or Reservoir
Interstate Highway
State Boundary
U.S. Highway
County Boundary
State Highway
SOURCES:
Air Quality Monitoring Locations, EPA 2013;
Meteorological Station Locations, NCDC 2013;
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008
NOTES:
• The alternative routes and series compensation siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.
Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014
0 10 20 40 60
Miles
Medicine Bow
Aeolus
Seminoe Dam
Rawlins
Wamsutter
Rock Springs
Tata
Green River
Flaming Gorge Reservoir
Flaming Gorge National Recreation Area
Sweetwater
Carbon
Saratoga
Baggs
Encampment
Medicine Bow National Forest
Albany
Hayden
Lay Peak
Maybell
Moffat
Craig
Craig 4 SW
Routt
Routt National Forest
Jackson
Steamboat Springs
Arapaho National Wildlife Refuge
Rocky Mountain NP
Grand
Dinosaur National Monument
Meeker
Rangely
Rangely 1E
Rio Blanco
White River National Forest
Vail
Eagle
Garfield
Fruita
Grand Junction Powell
Colorado National Monument
Mesa
Grand Junction
Grand Mesa National Forest
Pitkin
Aspen
Lake
Delta
Gunnison
Gunnison National Forest
Chaffee
Black Canyon of the Gunnison National Park
Uncompahgre National Forest
Montrose
Green River
Green River Aviation
Arches National Park
Moab
Emery
Sevier
Fishlake National Forest
Richfield
Fillmore
Sanpete
Manti-La Sal National Forest
Juab
Nephi
Mona
Clover
Fountain Green
Mount Pleasant
Fairview 8N
Fairview
Price
Hiawatha
Spanish Fork
North Provo
Provo
Orem
Utah Lake
Uinta National Forest
Utah
Duchesne
Ft. Duchesne
Ouray
Ouray National Wildlife Refuge
Uintah and Ouray Reservation
Fort Duchesne
Roosevelt
Vernal
Fruitland
Dinosaur National Monument
Redwash
Elk Springs
Bonanza
Rabbit Mountain
Uintah
Daggett
Summit
Morgan
Davis
Salt Lake City
Bountiful
Ogden
Layton
Great Salt Lake
Tooele
Draper
Park City
Wasatch
Wasatch-Cache National Forest
Cache
Rich
Logan
Tremonton
Bear River Refuge
Bear Lake
Franklin
Preston
IDAHO
UTAH
Oneida
Fossil Butte National Monument
Kemmerer
Seedskadee National Wildlife Refuge
Evanston
Uinta
WYOMING
COLORADO
Browns Park National Wildlife Refuge
Ashley National Forest
Wasatch-Cache National Forest
Medicine Bow National Forest
Encampment
Saratoga
Rawlins
Green River
Rock Springs
Kemmerer
Evanston
Lay Peak
Craig
Hayden
Baggs
Meeker
Rangely
Vernal
Roosevelt
Duchesne
Price
Nephi
Provo
Orem
Moab
Gunnison
Grand Junction
Vail
Aspen
Steamboat Springs
Rawlins
Medicine Bow
Seminoe Dam
Aeolus
Wamsutter
Rock Springs
Tata
Green River
Flaming Gorge Reservoir
Baggs
Hayden
Craig
Craig 4 SW
Maybell
Lay Peak
Dinosaur National Monument
Meeker
Rangely
Rangely 1E
Vernal
Roosevelt
Fort Duchesne
Duchesne
Ft. Duchesne
Ouray
Fruitland
Redwash
Elk Springs
Bonanza
Rabbit Mountain
Fairview 8N
Fairview
Price
Hiawatha
Nephi
Mona
Clover
Spanish Fork
North Provo
Grand Junction Powell
Fruita
Green River
Green River Aviation
Moab
Medicine Bow
Aeolus
Seminoe Dam
Rawlins
Wamsutter
Rock Springs
Tata
Green River
Flaming Gorge Reservoir
Baggs
Hayden
Craig
Craig 4 SW
Maybell
Lay Peak
Dinosaur National Monument
Meeker
Rangely
Rangely 1E
Vernal
Roosevelt
Fort Duchesne
Duchesne
Ft. Duchesne
Ouray
Fruitland
Redwash
Elk Springs
Bonanza
Rabbit Mountain
Fairview 8N
Fairview
Price
Hiawatha
Nephi
Mona
Clover
Spanish Fork
North Provo
Grand Junction Powell
Fruita
Green River
Green River Aviation
Moab

The climate of local areas is profoundly affected by differences in elevation and, to a lesser degree, by the orientation of mountain ranges and valleys with respect to general air movements. Wide variations in both temperature and precipitation occur within short distances. While temperature decreases, and precipitation generally increases with elevation, these patterns are modified by the orientation of mountain slopes with respect to the prevailing winds and by the effect of topographical features in creating local air circulation patterns (WRCC 2013b).

As a result of Colorado's distance from major sources of moisture (the Pacific Ocean and the Gulf of Mexico), precipitation is generally light in the lower elevations. Prevailing winds reach Colorado from westerly directions. Eastward-moving storms originating in the Pacific Ocean lose much of their moisture as rain or snow on the mountaintops and westward-facing slopes. Eastern slope areas receive relatively small amounts of precipitation from these storms (WRCC 2013b).

The climate of the plains is comparatively uniform, with characteristic features of low relative humidity, abundant sunshine, light rainfall, moderate to high wind movement, and a large daily range in temperature. A large portion of the annual precipitation falls during the growing season. During periods of drought, high winds give rise to dust storms (WRCC 2013b). The rugged topography of western Colorado causes large variations in climate within short distances and few climatic generalizations apply to the area. Snow-covered mountain peaks and valleys often have very cold nighttime temperatures in winter, when skies are clear and the air is still. As in Wyoming, this stagnation can give rise to elevated air pollutant concentrations. Summer in the mountains is a cool season; above 7,000 feet, the nights are quite cool throughout the summer, while bright sunshine makes the days comfortably warm (WRCC 2013b). The lower western valleys are protected by surrounding high terrain and have a greater uniformity of weather than the eastern plains. They experience high summer temperatures, comparable to those of the eastern plains, while average winter temperatures are somewhat lower than at similar elevations in the plains (WRCC 2013b).

Precipitation west of the Continental Divide is more evenly distributed throughout the year than in the eastern plains. For most of western Colorado, the greatest monthly precipitation occurs in the winter months, while June is the driest month. In contrast, June is one of the wetter months in most of the eastern portions of the state (WRCC 2013b). Thunderstorms are quite prevalent in the eastern plains and along the eastern slopes of the mountains during the spring and summer. These often become quite severe and the frequency of hail damage to crops in northeastern Colorado is quite high. Tornadoes almost never occur in the mountains or in the west and are relatively infrequent over the eastern plains. Other severe storms include the winter blizzards of the eastern high plains, while heavy snows in the high mountains create the danger of avalanches (WRCC 2013b). In years when snow cover is heavy, or when there is a sudden warming in the spring at high elevations, there may be extensive flooding. Heavy thunderstorms in the eastern foothills and plains occasionally cause damaging flash floods. Similar flash floods occur on the western slopes, but with somewhat lower frequency (WRCC 2013b).

As in other parts of the semiarid west, water is of prime importance in Colorado. In the eastern plains and in the flat valley areas, where agricultural activities are practicable, local precipitation is deficient. However, the heavy winter snow in the mountains provides a year-around source of water for streams and rivers. Many large reservoirs conserve the heavy spring runoff and often furnish power, in addition to serving irrigation purposes (WRCC 2013b). As a result of its varied climate, Colorado has a highly diversified agriculture. In wet years excellent crop yields are realized, but the erratic variation in precipitation from year to year can seriously affect production. Periodic droughts, extending from one or two to several years, create severe agricultural and economic problems (WRCC 2013b). The portion of Colorado from the mountains west is so varied in terrain and climate that no overall description of the agriculture of the region may be made. At the higher western elevations, livestock husbandry is the most

important agricultural activity. The sheltered valleys of western Colorado are very fertile and the climate is generally mild. Excellent pastures are found in many of the higher river and creek valleys and hay is one of the large and profitable crops (WRCC 2013b).

Winter sports are popular in the state. The abundant snowfall means good skiing in many areas from November to as late as May (WRCC 2013b). Table 3-3 shows 30-year normal climate temperature and precipitation records for stations located along the alternative route study corridors in Colorado (generally arranged from north to south and east to west). Map 3-2 shows the location of these climate stations.

TABLE 3-3
CLIMATE STATISTICS FOR COLORADO

Climate	Month												Annual
	January	February	March	April	May	June	July	August	September	October	November	December	
Hayden, Colorado (Latitude: 40.4928, Longitude: -107.2547, Elevation: 6,466.9 feet, 1,971.1 meters)													
Average Maximum Temperature	30.3	34.5	46.3	58.3	68.4	78.7	85.2	83.2	74.4	61.4	44.4	31.3	58.1
Average Minimum Temperature	8.3	11.8	21.6	29.3	37.0	43.6	50.0	49.1	40.6	30.6	20.4	9.9	29.4
Average Total Precipitation	1.60	1.33	1.36	1.85	1.70	1.22	1.37	1.37	1.79	1.72	1.61	1.61	18.53
Average Total Snowfall	24.8	18.4	14.0	9.7	1.3	0.0	0.0	0.0	0.3	5.4	17.7	23.5	115.1
Craig 4 SW, Colorado (Latitude: 40.4506, Longitude: -107.5894, Elevation: 6.496 feet, 1,980 meters)													
Average Maximum Temperature	31.2	35.1	46.2	56.6	65.9	77.2	85.1	83.2	73.7	60.8	44.3	32.0	57.7
Average Minimum Temperature	7.3	10.7	20.5	27.9	36.4	43.7	50.2	49.1	39.8	29.5	19.4	8.9	28.7
Average Total Precipitation	1.06	1.19	1.36	1.68	1.40	1.28	1.20	1.24	1.90	1.81	1.46	1.14	16.72
Average Total Snowfall	15.5	13.4	12.2	5.8	0.8	0.1	0.0	0.0	0.3	2.9	10.6	14.6	76.2
Maybell, Colorado (Latitude: 40.5158, Longitude: -108.0947, Elevation: 5,943.9 feet, 1,811.7 meters)													
Average Maximum Temperature	33.3	37.3	48.7	59.1	68.8	79.6	87.0	84.8	74.9	61.3	45.6	33.6	59.6
Average Minimum Temperature	1.7	6.8	18.4	25.6	33.4	40.3	47.4	45.8	35.5	25.4	14.8	3.4	25.0
Average Total Precipitation	0.83	0.86	1.05	1.35	1.12	1.14	0.85	0.98	1.40	1.39	1.10	0.97	13.04
Average Total Snowfall	11.0	10.7	9.1	3.0	0.8	0.0	0.0	0.0	0.1	2.0	9.3	12.4	58.4

TABLE 3-3
CLIMATE STATISTICS FOR COLORADO

Climate	Month												Annual
	January	February	March	April	May	June	July	August	September	October	November	December	
Dinosaur National Monument, Colorado (Latitude: 40.2442, Longitude: -108.9719, Elevation: 5,972.11 feet, 1,820.3 meters)													
Average Maximum Temperature	33.2	39.2	51.7	61.5	72.6	84.1	91.2	88.3	78.1	63.5	46.5	33.7	62.1
Average Minimum Temperature	11.2	15.6	25.8	32.4	40.9	49.8	56.9	55.2	46.3	35.3	23.5	13.0	33.9
Average Total Precipitation	0.54	0.57	0.80	1.10	1.27	0.79	0.89	0.95	1.40	1.52	0.87	0.70	11.40
Average Total Snowfall	8.2	5.9	3.9	1.9	0.3	0.0	0.0	0.0	0.0	0.7	4.9	8.8	34.6
Rangely 1 E, Colorado (Latitude: 40.0894, Longitude: -108.7717, Elevation: 5,285.1 feet, 1,610.9 meters)													
Average Maximum Temperature	30.8	38.1	51.6	61.7	72.0	83.6	91.0	88.4	78.5	64.6	46.9	32.3	61.7
Average Minimum Temperature	3.5	10.6	23.7	31.7	40.7	49.4	56.0	54.2	44.2	31.9	19.9	6.7	31.1
Average Total Precipitation	0.58	0.61	0.91	1.12	1.10	0.89	0.85	1.04	1.41	1.48	0.87	0.60	11.46
Average Total Snowfall	7.7	5.4	3.3	2.1	0.1	0.0	0.0	0.0	0.0	0.2	3.4	7.4	29.6
Meeker, Colorado (latitude: 40,036, Longitude: -107.906, Elevation: 6,230 feet, 1,898.9 meters)													
Average Maximum Temperature	32.8	37.4	48.1	57.3	66.6	77.3	84.9	82.1	73.3	61.0	45.5	33.6	58.3
Average Minimum Temperature	3.8	8.9	17.8	25.1	31.9	38.6	44.5	43.8	35.8	25.5	15.8	6.5	24.8
Average Total Precipitation	1.10	1.07	1.49	1.79	1.60	1.24	1.29	1.51	1.72	1.91	1.50	1.23	17.45
Average Total Snowfall	13.3	11.3	7.4	5.6	0.5	0.0	0.0	0.0	0.1	3.5	11.2	13.9	66.8
Fruita, Colorado (Latitude: 39.1653, Longitude: -108.7331, Elevation: 4,504.9 feet, 1,373.1 meters)													
Average Maximum Temperature	38.2	45.8	57.5	66.1	76.3	86.9	92.7	89.6	80.9	67.7	52.4	39.8	66.2
Average Minimum Temperature	13.4	20.9	28.6	35.1	44.0	51.9	59.0	57.4	47.0	35.1	24.9	16.6	36.2
Average Total Precipitation	0.63	0.65	0.93	0.85	0.75	0.58	0.69	0.89	1.03	1.23	0.74	0.69	9.66
Average Total Snowfall	2.7	1.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.9	2.6	7.8

SOURCE: National Climatic Data Center 2013 (period of record: 1981 to 2010)
NOTE: Temperatures shown in degrees Fahrenheit. Precipitation and snowfall shown in inches.

Utah's Climate

The topography of Utah is extremely varied, with most of the state being mountainous. A series of mountains (including the Wasatch Range), which run generally north and south through the middle of Utah, and the Uinta Mountains, which extend east and west through the northeast portion, are the principal ranges. Less extensive ranges are scattered over the remainder of the state. The lowest area is the Virgin River Valley in the southwestern part with elevations between 2,500 and 3,500 feet, while the highest point is Kings Peak in the Uinta Mountains, which rises to 13,498 feet (WRCC 2013c).

Eastern Utah is drained by the Colorado River and its principal tributary within the state, the Green River, although neither rises within its borders. Western Utah is almost entirely within the Great Basin, with no outlet to the sea (WRCC 2013c).

Utah's climate is determined by its distance from the equator, its elevation above sea level, the location of the state with respect to the average storm paths over the Intermountain Region, and its distance from the principal moisture sources of the area, the Pacific Ocean and the Gulf of Mexico. Also, the mountain ranges over the western United States, particularly the Sierra Nevada, Cascade Ranges, and the Rocky Mountains, have a marked influence on the climate of the state. Pacific storms, before reaching Utah, must first cross the Sierras or Cascades. As the moist air is forced to rise over these high mountains, a large portion of the original moisture falls as precipitation. Thus, the prevailing westerly winds reaching Utah are comparatively dry, resulting in light precipitation over most of the state (WRCC 2013c).

Great Salt Lake, in northwestern Utah, lies in the Great Basin, the largest closed basin in North America. Since this large body of water now has no drainage outlet, the salt content is high, averaging about 25 percent. Thus, the lake, which never freezes over, provides a moderating effect throughout the year on temperatures in the immediate vicinity (WRCC 2013c).

There are variations in temperature with elevation and latitude. The mountains and the elevated valleys have cooler climates, with the lower areas of the state having higher temperatures. Average yearly temperature also decreases from south to north. Weather stations in the southern counties generally have average annual temperatures 6 to 8 degrees Fahrenheit higher than those at similar altitudes over the northern counties (WRCC 2013c).

Prolonged periods of extremely cold weather are rare. This is primarily due to the mountains east and north of the state, which act as a barrier to intensely cold continental Arctic air masses (WRCC 2013c).

Sunny skies prevail most of the year in Utah. The state experiences relatively strong insolation during the day and rapid nocturnal cooling, resulting in wide daily ranges in temperature. Even after the hottest days, nights are usually cool (WRCC 2013c).

On clear nights the colder air accumulates, by drainage, on the valley bottoms, while the foothills and bench areas remain relatively warm. For this reason, the higher lands at the edges of the valleys are devoted to more delicate fruits, berries, and vegetables, while hardier grains and vegetables are planted in the bottom lands (WRCC 2013c).

Precipitation varies greatly, from an average of less than 5 inches annually over the Great Salt Lake Desert (west of Great Salt Lake), to more than 40 inches in some parts of the Wasatch Mountains. The average annual precipitation in the leading agricultural areas is between 10 to 15 inches, requiring irrigation for the economic production of most crops (WRCC 2013c).

Snowfall is moderately heavy in the mountains, especially over the northern part of the state. This is conducive to a large amount of winter sports activity, including skiing (WRCC 2013c).

Runoff from melting mountain snow usually reaches a peak in April, May, or early June, and sometimes causes flooding along the lower streams. Flash floods from summer thunderstorms also occur. The most serious floods in Utah have occurred in the Great Basin (WRCC 2013c).

During the late fall and winter months, anticyclones tend to settle over the Great Basin for as long as several weeks at a time. Under these conditions, smoke and haze accumulate in the lower levels of the stagnant air over the valleys of northwestern Utah, frequently becoming an obstruction to visibility. This is also true of fog, which may persist for several weeks at a time (WRCC 2013c).

Wind speeds are usually light to moderate, below 20 mph. Tornados are fairly rare and cause only slight damage. However, strong winds occur occasionally, particularly in the vicinity of the canyon mouths along the western slopes of the Wasatch Mountains. Dust storms occur occasionally over western Utah, primarily during the spring months (WRCC 2013c).

Utah is not a large agricultural state, even though appreciable crops, livestock, and dairy products are produced within its boundaries. Only 4 percent of the land is under cultivation, but approximately 35 percent of the land area is used for livestock grazing. The largest crop is wheat, most of it being winter or dryland wheat. Other principal crops are barley, oats, hay, potatoes, corn, and sugar beets. Range feeds and dryland crops in nonirrigable areas, particularly in the southern portion of the state, often suffer from lack of moisture. Hailstorms may damage fruit and vegetables in limited areas during spring and summer, although the hail is usually small (WRCC 2013c).

Table 3-4 shows 30-year normal climate temperature and precipitation records for stations located along the alternative route study corridors in Utah (generally arranged from north to south and east to west). Map 3-2 shows the location of these climate stations.

TABLE 3-4
CLIMATE STATISTICS FOR UTAH

Climate	Month												
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Bonanza, Utah (Latitude: 40.0167, Longitude: -109.1833, Elevation: 5,45.13 feet, 1,661.2 meters)													
Average Maximum Temperature	30.7	37.8	51.7	63.7	73.0	86.2	92.3	89.4	79.6	65.5	47.2	32.5	62.6
Average Minimum Temperature	8.6	15.3	25.8	33.3	41.5	51.7	57.6	55.4	46.1	34.9	24.0	11.6	33.9
Fort Duchesne, Utah (Latitude: 40.2842, Longitude: -109.8611, Elevation: 5,051.8 feet, 1,539.8 meters)													
Average Maximum Temperature	29.2	37.3	52.3	63.7	73.4	84.2	91.9	89.1	78.8	64.7	47.1	31.8	62.1
Average Minimum Temperature	5.8	13.0	25.0	31.6	40.8	48.1	54.8	53.1	43.6	33.0	21.9	9.6	31.8
Average Total Precipitation	0.32	0.30	0.36	0.44	0.67	0.43	0.37	0.68	0.69	1.01	0.28	0.41	5.96

TABLE 3-4
CLIMATE STATISTICS FOR UTAH

Climate	Month												
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Duchesne, Utah (Latitude: 40.1678, Longitude: -110.3950, Elevation: 5,520 feet, 1,682.5 meters)													
Average Maximum Temperature	31.5	38.1	52.2	62.2	71.4	81.0	86.7	84.1	75.2	62.0	45.8	32.8	60.4
Average Minimum Temperature	8.4	14.3	25.3	32.6	40.6	48.1	54.7	53.0	44.4	33.6	22.0	11.0	32.4
Average Total Precipitation	0.57	0.59	0.66	0.88	0.99	0.77	0.97	1.27	1.21	1.01	0.55	0.64	10.11
Average Total Snowfall	7.3	7.2	3.2	1.6	0.2	0.0	0.0	0.0	0.0	0.8	2.7	7.8	30.8
Fairview 8N, Utah (Latitude: 39.7483, Longitude: -111.4164, Elevation: 6,750 feet, 2,057.4 meters)													
Average Maximum Temperature	35.9	37.2	45.5	54.7	64.0	75.1	81.9	80.8	72.7	58.9	43.8	34.3	57.2
Average Minimum Temperature	11.5	15.1	22.7	29.4	36.4	44.5	51.7	50.3	43.0	31.4	22.1	13.2	31.0
Average Total Precipitation	1.64	1.41	1.49	1.46	1.73	1.13	0.94	1.21	1.48	1.76	1.40	1.77	17.42
Average Total Snowfall	21.3	19.0	15.0	8.0	3.3	0.3	0.0	0.0	0.3	4.6	13.4	25.5	110.7
Nephi, Utah (Latitude: 39.7122, Longitude: -111.8319, Elevation: 5,127.95 feet, 1,563.0 meters)													
Average Maximum Temperature	36.4	41.4	52.2	60.7	70.3	81.0	88.8	86.6	77.3	63.8	48.2	36.3	62.0
Average Minimum Temperature	20.1	23.9	30.9	36.7	44.3	52.7	60.5	59.1	49.6	38.7	28.6	20.4	38.9
Average Total Precipitation	1.31	1.29	1.63	1.67	1.62	0.96	0.75	0.91	1.19	1.57	1.28	1.33	15.51
Average Total Snowfall	12.3	9.9	7.1	3.2	0.5	0.0	0.0	0.0	0.0	1.2	7.3	13.6	55.1
Hiawatha, Utah (Latitude: 39.4833, Longitude: -111.0167, Elevation: 7,279.86 feet, 2,218.9 meters)													
Average Maximum Temperature	32.8	38.2	45.9	55.3	65.0	75.4	81.8	78.3	71.1	57.5	42.4	33.4	56.5
Average Minimum Temperature	14.8	17.0	24.0	30.9	37.9	47.4	54.6	52.4	44.8	33.9	21.5	13.9	32.8

TABLE 3-4 CLIMATE STATISTICS FOR UTAH													
	Month												
Climate	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Green River Aviation, Utah (Latitude: 38.9906, Longitude: -110.1544, Elevation: 4,069.9 feet, 1,240.5 meters)													
Average Maximum Temperature	41.1	50.5	62.9	72.0	82.2	93.0	98.5	94.9	86.0	71.3	55.6	43.5	71.1
Average Minimum Temperature	13.7	21.3	30.3	38.2	46.8	55.1	61.3	60.0	49.0	36.9	24.6	16.5	37.9
Average Total Precipitation	0.49	0.59	0.71	0.59	0.56	0.38	0.80	0.78	0.84	0.98	0.45	0.43	7.60
Average Total Snowfall	3.4	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.5	7.6

SOURCE: National Climatic Data Center 2013 (period of record: 1981 to 2010)
NOTE: Temperatures shown in degrees Fahrenheit. Precipitation and snowfall shown in inches.

3.2.1.3.2 Climate Change

Climate variability and change exert profound influences on agriculture, natural ecosystems, wildfires, tourism, and water resources. Climate is determined by fixed or slowly varying factors that modulate weather. The primary factors include the intensity of sunlight, the Earth's orbital geometry, and latitude. In addition to the sun's radiation, the Earth's surface receives infrared radiation from the atmosphere above. The intensity of infrared radiation is determined by cloud cover, humidity, and the atmospheric concentrations of infrared-absorbing trace gases (GHGs), such as carbon dioxide (CO_2) (Gutzler 2005).

Other climatic conditions vary depending on longitude. Such longitudinally varying conditions include the distribution of oceans and continents, continental topography, and land surface cover. "Average weather" can vary systematically from year to year. Such variability in climate is associated with changes in ocean temperatures that modulate storm tracks and moisture transport for entire seasons or years. Slow variations in ocean temperature and currents, especially in the Pacific Ocean, are a major cause of wintertime climate variability across North America (Gutzler 2005).

The El Niño cycle, a tongue of anomalously warm Pacific Ocean surface water extending along the equator westward from the South American coast is the best known and best understood example. El Niño pulls the North Pacific atmospheric jet stream, and the storm track associated with it, southward and eastward, with increased precipitation over the southwestern United States. The mirror-image cold phase, La Niña, has the opposite effect, pushing the jet stream northward and leaving the southwestern states drier than normal. Extreme warm and cold phases tend to occur several years per decade, reaching maximum amplitude in the Northern Hemisphere's winter season (Gutzler 2005).

Recent research suggests that longer, multi-decadal fluctuations in the northern Pacific Ocean also affect precipitation across southwestern North America. Northern Pacific Ocean temperatures seem to vary more slowly than tropical El Niño-related anomalies. This Pacific Decadal Oscillation tends to modulate the effects of El Niño. A negative Pacific Decadal Oscillation seems to bring greater drought to the southwestern United States, while a positive phase brings wet decades (Gutzler 2005).

Forming a backdrop to climate variability are constant climatic shifts that occur over longer time scales. During the last ice age, abundant geological evidence indicates that huge ice sheets covered much of North America. That event was merely the latest in a long series of ice age cycles that have characterized climate over the last 2 million years. Ice age cycles are thought to be caused by decreases in the tilt of Earth's rotational axis (Gutzler 2005). Climate change is a normal part of the aging and evolution of the Earth and of changes in the factors that control climate that occur over multi-year to multi-decadal cycles (Gutzler 2005).

The climate of the intermountain west is changing, with multiple independent measurements indicating an overall warming of about 2 degrees Fahrenheit across the region in the past 30 years. While climate in this region has always been highly variable at annual, decadal, century, and longer time scales, the rate of recent change is unusually rapid. It is also consistent with the well-understood physical effects of the increasing accumulations of GHGs in the atmosphere. While there has been no study specifically investigating whether the recent warming trends in Colorado, Utah, and Wyoming can be attributed to GHGs, such attribution has been made at continental (western North America) and global scales. Thus, it is reasonable to conclude that a substantial fraction of the recent warming in the region is due to anthropogenic climate change (Western Water Assessment 2013).

According to the U.S. National Oceanic and Atmospheric Administration's National Climatic Data Center, the "greenhouse effect" is a natural process that helps to regulate the temperature of the planet. It results from heat absorption by GHGs in the atmosphere and the re-radiation downward of some of that heat. Water vapor is the most abundant GHG, followed by CO_2 and other trace gases. Without a natural greenhouse effect, the average temperature of the Earth would be approximately 0 degrees Fahrenheit (-18 degrees Celsius), instead of its present 57 degrees Fahrenheit (14 degrees Celsius). Thus, the concern is not with the greenhouse effect itself, but whether human activities are enhancing the effect through GHG emissions from fossil fuel combustion and deforestation (Easterling and Karl 2011).

Human activity has clearly been increasing the concentration of GHGs in the atmosphere in recent years (primarily CO_2 from the combustion of coal, oil, and gas). Pre-industrial levels of CO_2 were approximately 280 parts per million by volume and current levels are approximately 400 per million by volume, increasing at a rate of 1.9 ppm per year since 2000. The global concentration of CO_2 in the atmosphere today far exceeds the natural range over the last 650,000 years of 180 to 300 per million by volume. According to the United Nation's Intergovernmental Panel on Climate Change, by the end of the 21st century, CO_2 concentrations could be 75 to 350 percent above the pre-industrial concentration (Easterling and Karl 2011).

It is less clear whether the persistent drought conditions in the intermountain west since 2000 are related to anthropogenic climate change. The variations since 2000 in precipitation, the main driver of drought conditions, are consistent with the natural variability seen in long-term observed climate and paleoclimate records. However, the observed warming may have increased the severity of drought and exacerbated drought impacts, such as low streamflows (Western Water Assessment 2013).

Global Climate Models (GCMs) are highly sophisticated computer representations of the global climate system—the atmosphere, the oceans, ice sheets and sea ice, and the land surface—based on both physical laws and parameters derived from observation. GCMs are the principal tools used by climate scientists to diagnose the causes of climate variability and to make projections of future climate, given the potential trajectories for GHG concentrations. (Western Water Assessment 2013)

The consensus of projections from about 20 different GCMs is that the intermountain west will warm by 2.5 degrees Fahrenheit [+1.5 to +3.5 degrees Fahrenheit] by 2025, relative to the 1950–99 baseline, and 4 degrees Fahrenheit [+2.5 to +5.5 degrees Fahrenheit] by 2050. The projections show summers warming more (+5 degrees Fahrenheit [+3 to +7 degrees Fahrenheit]) than winters (+3 degrees Fahrenheit [+2 to

+5 degrees Fahrenheit]), and typical summer temperatures in 2050 will be as warm as or warmer than the hottest 10 percent of summers that occurred between 1950 and 1999. Temperature regimes will effectively shift upslope and northwards as the climate warms. Note that the range of climate model projections does not capture the entire range of uncertainty (Western Water Assessment 2013).

The individual GCM projections do not agree whether average annual precipitation will increase or decrease in the region by 2050. The multi-model average shows little change in annual mean precipitation by 2050, though with a slight tendency towards drying in the southern part of the region and wetter conditions in the northern part of the region. The multi-model average also suggests a seasonal shift in precipitation, as the combined effects of a northward-shifting storm track, potentially wetter storms, and a drying of the sub-tropical regions globally may result in more mid-winter precipitation, and in some areas, a decrease in late spring and summer precipitation (Western Water Assessment 2013).

Record-setting wildfires are likely due to rising temperatures, related reductions in spring snowpack and soil moisture, and the effects of bark beetle infestations. Increased frequency and altered timing of flooding will increase risks to people, ecosystems, and infrastructure. Ozone pollution, which in some areas of the intermountain west increase as summer temperatures rise and clouds decrease, may also increase as a result of climate change (U.S. Global Change Research Program 2012).

More intense, longer-lasting heat waves will result in increasing demands for air-conditioning, depleting electrical generation and distribution capacities, resulting in increased risks of brownouts and blackouts. In addition, electricity supply will be affected by changes in the timing of river flows and where hydroelectric systems have limited storage capacity and reservoirs, since increased year-to-year variability of precipitation is expected (U.S. Global Change Research Program 2012).

3.2.1.3.3 Air Quality

Air quality monitoring networks operate in urban and rural areas throughout Wyoming, Colorado, and Utah, to inform the public about local air quality conditions and to help regulatory agencies identify sources of air pollution. Various agencies (state, federal, and local), companies, individuals, and organizations collect ambient air quality monitoring data at carefully chosen, representative physical locations. Monitors are sited to determine ambient concentrations of both criteria pollutants and HAPs. Networks also monitor the nature and cause of visibility impairment in Class I areas (areas where only a small amount of air quality deterioration is allowed) in all three states.

Air Quality in Wyoming

Table 3-5 shows recent air quality data from monitoring stations near the alternative route study corridors. Map 3-2 shows the air quality monitoring locations in Wyoming, Colorado, and Utah that have been used for this study. Map 3-3 shows the locations of the Class I areas that are closest to the alternative route study corridors. None of the alternative route study corridors will traverse any nonattainment or maintenance areas in Wyoming. The closest nonattainment area is the Upper Green River Basin Area, comprising parts of Lincoln, Sublette, and Sweetwater counties, which is designated a marginal nonattainment area for the 2008 8-hour ozone NAAQS. The nonattainment area is located to the west of the alternative route study corridors. These three counties are designated attainment/unclassifiable for all other NAAAQS. Carbon County, which includes the eastern portions of the alternative route study corridors in Wyoming, is designated attainment/unclassifiable for all NAAQS.

Wyoming has seven mandatory federal Class I PSD areas, which require additional protection under federal regulations, including two National Parks (Yellowstone and Grand Teton), and five wilderness areas (North Absaroka, Washakie, Teton, Bridger, and Fitzpatrick). All are located well to the northwest of the alternative route study corridors. In addition, Wyoming has one state Class I area, the Savage Run Wilderness Area. Savage Run Wilderness Area is located approximately 41 miles to the southeast of the

alternative route study corridors, on the west side of the Medicine Bow Range in Carbon and Albany counties.

TABLE 3-5
AIR QUALITY DATA FOR WYOMING

Site/Location	Year	Pollutant	Averaging Period	Concentration
Wamsutter (Sweetwater County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.060 ppm (4th maximum)
Wamsutter (Sweetwater County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	38 ppb (98th percentile)
			Annual	4.6 ppb
Wamsutter (Sweetwater County)	2010 to 2012 (3-year average)	PM_{10}	24-hour	58.4 µg/m^3 (2nd maximum)
			Annual	13.7 µg/m^3
Rock Springs (Sweetwater County)	2010 to 2012 (3-year average)	PM_{10}	24-hour	58.3 µg/m^3 (2nd maximum)
			Annual	—
Rock Springs (Sweetwater County)	2010 to 2012 (3-year average)	$PM_{2.5}$	24-hour	14.3 µg/m^3 (98th percentile)
			Annual	5.9 µg/m^3
Wamsutter (Sweetwater County)	2009	Sulfur dioxide	1-hour	7 ppb (99th percentile)
			3-hour	3.9 ppb (2nd maximum)
Tata (Sweetwater County)	2011 to 2012 (2-year average)	Carbon monoxide	1-hour	1.2 ppm
			8-hour	0.95 ppm

SOURCES: Air Resource Specialists 2010, 2011, 2012a and b, 2013; Environmental Protection Agency 2013b
NOTES:
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
ppm = Parts per million
ppb = Parts per billion
µg/m^3 = micrograms per cubic meter

Air Quality in Colorado

The alternative route study corridors traverse portions of Moffat, Rio Blanco, Garfield, Mesa, and Routt counties. All of Moffat, Rio Blanco, Garfield, and Mesa counties are designated attainment/unclassifiable for all NAAQS. A portion of Routt County in the immediate vicinity of Steamboat Springs is a designated maintenance area for particulate matter less than 10 micrometers diameter (PM_{10}). However, the maintenance area is well to the east of any of the alternative route study corridors. The remainder of Routt County is designated attainment/unclassifiable for all other NAAQS.

Colorado has several federal Class I PSD areas including four National Parks (Rocky Mountain, Black Canyon of the Gunnison, Great Sand Dunes, and Mesa Verde) and eight wilderness areas (Mount Zirkel, Rawah, Flat Tops, Eagles Nest, Maroon Bells-Snowmass, West Elk, La Garita, and Weminuche). In addition, Colorado affords Class I protection to certain Class II areas with respect to PSD increments for SO_2. These Class II areas are the Florissant Fossil Beds National Monument, Colorado National Monument, Dinosaur National Monument, portions of Black Canyon of the Gunnison National Park and Great Sand Dunes National Park and Preserve that are not Class I areas, the Uncompahgre Mountain Primitive Area, Wilson Mountain Primitive Area, and BLM land in the Gunnison Gorge Recreation Area.

The Class I and protected Class II areas closest to the alternative route study corridors include the Mount Zirkel Wilderness Area (34 miles), Dinosaur National Monument (0 miles; certain transmission line alternative routes cross the Deerlodge Road that leads into the national monument), Flat Tops Wilderness Area (26 miles), and the Colorado National Monument (16 miles).

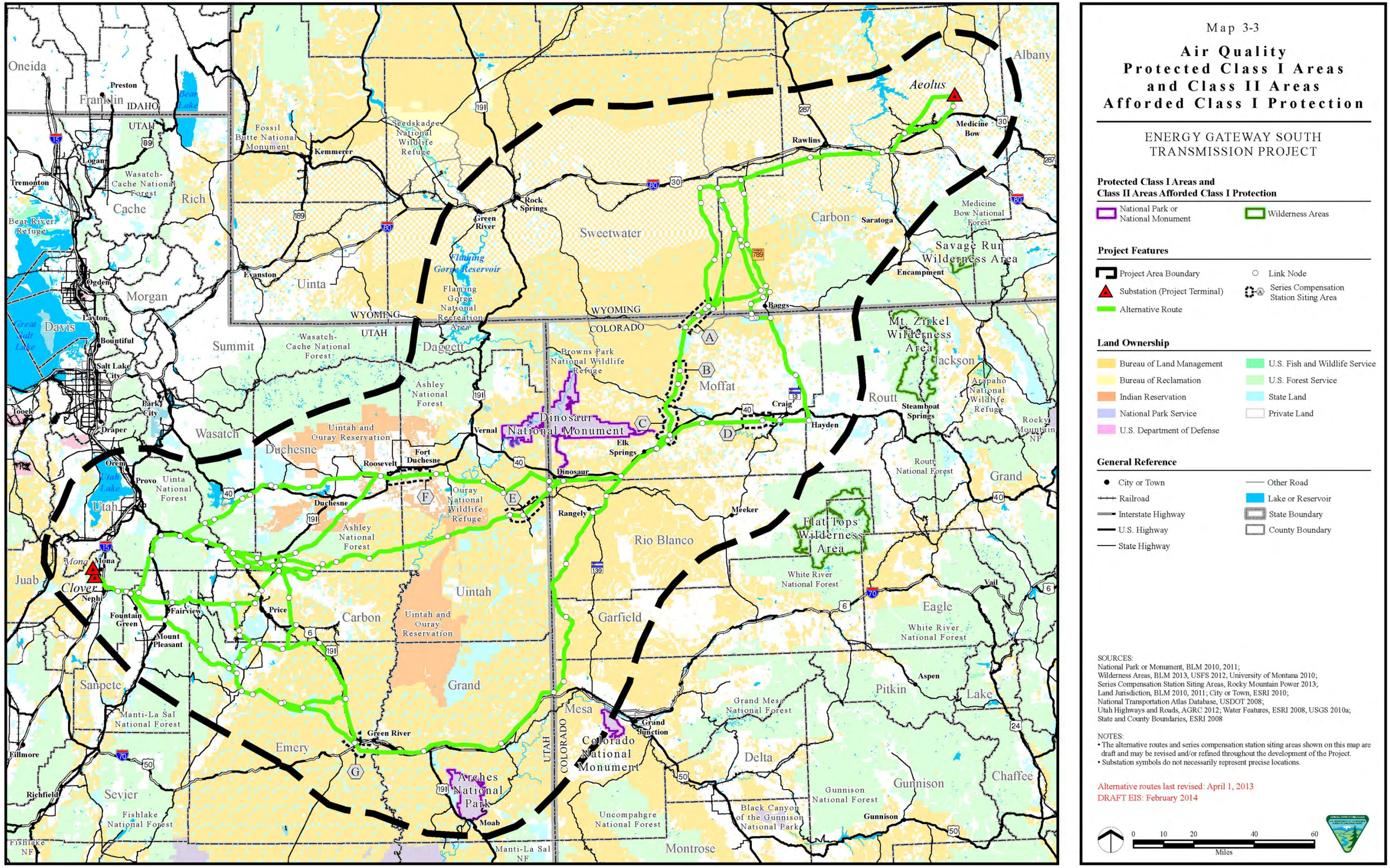

Map 3-3
Air Quality
Protected Class I Areas
and Class II Areas
Afforded Class I Protection
ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT
Protected Class I Areas and
Class II Areas Afforded Class I Protection
National Park or National Monument
Wilderness Areas
Project Features
Project Area Boundary
Link Node
Substation (Project Terminal)
Series Compensation Station Siting Area
Alternative Route
Land Ownership
Bureau of Land Management
U.S. Fish and Wildlife Service
Bureau of Reclamation
U.S. Forest Service
Indian Reservation
State Land
National Park Service
Private Land
U.S. Department of Defense
General Reference
City or Town
Other Road
Railroad
Lake or Reservoir
Interstate Highway
State Boundary
U.S. Highway
County Boundary
State Highway
SOURCES:
National Park or Monument, BLM 2010, 2011;
Wilderness Areas, BLM 2013, USFS 2012, University of Montana 2010;
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
Land Jurisdiction, BLM 2010, 2011; City or Town, ESRI 2010;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008
NOTES:
• The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.
Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014
0 10 20 40 60
Miles
Aeolus
Clover
Mona
Oneida
Franklin
Preston
IDAHO
UTAH
Bear Lake
Logan
Tremonton
Wasatch-Cache National Forest
Cache
Rich
Bear River Refuge
Ogden
Morgan
Davis
Great Salt Lake
Layton
Bountiful
Salt Lake City
Tooele
Park City
Draper
Summit
Wasatch
Orem
Provo
Uinta National Forest
Utah
Utah Lake
Juab
Nephi
Fountain Green
Fairview
Mount Pleasant
Sanpete
Manti-La Sal National Forest
Fillmore
Richfield
Sevier
Fishlake National Forest
Fishlake NF
Fossil Butte National Monument
Kemmerer
Seedskadee National Wildlife Refuge
Rock Springs
Green River
Evanston
Uinta
Flaming Gorge Reservoir
Flaming Gorge National Recreation Area
WYOMING
Daggett
Wasatch-Cache National Forest
Ashley National Forest
Uintah and Ouray Reservation
Duchesne
Roosevelt
Fort Duchesne
Vernal
Ouray National Wildlife Refuge
Price
Carbon
Uintah
Grand
Emery
Green River
Arches National Park
Moab
Manti-La Sal NF
Sweetwater
Browns Park National Wildlife Refuge
Dinosaur National Monument
Elk Springs
Dinosaur
Rangely
Rawlins
Baggs
Moffat
Craig
Hayden
Rio Blanco
Garfield
Mesa
Grand Junction
Colorado National Monument
COLORADO
UTAH
Uncompahgre National Forest
Montrose
Meeker
White River National Forest
Grand Mesa National Forest
Delta
Gunnison National Forest
Black Canyon of the Gunnison National Park
Gunnison
Albany
Medicine Bow
Medicine Bow National Forest
Saratoga
Encampment
Savage Run Wilderness Area
Mt. Zirkel Wilderness Area
Jackson
Arapaho National Wildlife Refuge
Routt
Steamboat Springs
Rocky Mountain NP
Routt National Forest
Grand
Flat Tops Wilderness Area
Vail
Eagle
White River National Forest
Aspen
Pitkin
Lake
Chaffee
Gunnison

Table 3-6 shows recent air quality data from monitoring stations near the alternative routes study corridors. Map 3-3 shows the air quality monitoring locations in Wyoming, Colorado, and Utah that have been used for this study. Map 3-3 shows the locations of the Class I areas (and Class II areas afforded special protection) that are closest to the alternative route study corridors.

TABLE 3-6
AIR QUALITY DATA FOR COLORADO

Site/Location	Year	Pollutant	Averaging Period	Concentration
Lay Peak (Moffat County)	2011 to 2012 (2-year average)	Ozone	8-hour	0.063 ppb (4th maximum)
Meeker (Rio Blanco County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.064 ppb (4th maximum)
Rangely (Rio Blanco County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.067 ppb (4th maximum)
Palisade (Mesa County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.068 ppb (4th maximum)
Colorado National Monument (Mesa County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.068 ppb (4th maximum)
Meeker (Rio Blanco County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	5 ppb (98th percentile)
Rangely (Rio Blanco County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	21 ppb (98th percentile)
Grand Junction Powell (Mesa County)	2010 to 2012 (3-year average)	PM_{10}	24-hour	43.5 µg/m3 (2nd maximum)
Rangely (Rio Blanco County)	2010 to 2012 (3-year average)	$PM_{2.5}$	24-hour	12 µg/m3 (98th percentile)
			Annual	3.1 µg/m3
Grand Junction Powell (Mesa County)	2010-2012 (3-year average)	$PM_{2.5}$	24-hour	27.7 µg/m3 (98th percentile)
			Annual	7.8 µg/m3
Welby (Denver County)	2010 to 2012 (3-year average)	Sulfur dioxide	1-hour	31.7 ppb (99th percentile)
	2009-2011 (3-year average)		3-hour	23 ppb (2nd maximum)
Walden (Jackson County)	2011to 2012 (2-year average)	Sulfur dioxide	1-hour	3 ppb (99th percentile)
Grand Junction Pitkin (Mesa County)	2010 to 2012 (3-year average)	Carbon monoxide	1-hour	1.7 ppm (2nd maximum)
			8-hour	1.1 ppm (2nd maximum)
Denver Municipal Animal Shelter (Denver County)	2009-2011 (3-year average)	Lead	Quarterly	0.0092 µg/m3 (maximum)

SOURCES: Colorado Department of Public Health and Environment 2010, 2011, 2012; Environmental Protection Agency 2013a
NOTES:
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
ppm = Parts per million
ppb = Parts per billion
$\mu g/m^3$ = micrograms per cubic meter

Air Quality in Utah

The alternative route study corridors traverse portions of Grand, Carbon, Emery, Sanpete, Juab, Wasatch, Uintah, Duchesne, and Utah counties. All of Grand, Carbon, Emery, Sanpete, Juab, and Wasatch counties are designated attainment/unclassifiable for all NAAQS. Uintah and Duchesne counties are attainment/unclassifiable for all NAAQS except the 2008 8-hour ozone NAAQS. These two counties are seeing a great deal of growth in oil and gas production and have been the locus of several intense field studies to examine patterns and causes of elevated ozone and particulate matter less than 2.5 micrometers diameter ($PM_{2.5}$) concentration in recent years. As result, EPA has designated these counties as unclassifiable with respect to the 8-hour ozone standards at this time until additional monitoring data can be collected.

Portions of Utah County are designated as maintenance areas for CO and as a nonattainment area for the $PM_{2.5}$ NAAQS. No portion of the alternative route study corridors will traverse either the CO maintenance or $PM_{2.5}$ nonattainment area. However, the entire county is designated nonattainment for the PM_{10} NAAQS and the nonattainment area will be traversed by portions of Alternatives COUT-A, COUT-B, and COUT-C and their associated route variations. A conformity analysis is required for this nonattainment area.

There are five federal Class I PSD areas in Utah, all National Parks: Arches National Park, Canyonlands National Park, Capitol Reef National Park, Bryce Canyon National Park, and Zion National Park. The closest Class I PSD area to the alternative route study corridors is Arches National Parks, located approximately 8 miles to the south.

Table 3-7 shows recent air quality data from monitoring stations near the alternative routes study corridors. Map 3-2 shows the air quality monitoring locations in Wyoming, Colorado, and Utah that have been used for this study. Map 3-3 shows the locations of the Class I areas that are closest to the alternative route study corridors.

TABLE 3-7
AIR QUALITY DATA FOR UTAH

Site/Location	Year	Pollutant	Averaging Period	Concentration
Dinosaur National Monument (Uintah County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.078 ppm (4th maximum)
Vernal (Uintah County)	2012	Ozone	8-hour	0.064 ppm (4th maximum)
Rabbit Mountain (Uintah County)	2012	Ozone	8-hour	0.072 ppm (4th maximum)
Redwash (Uintah County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.088 ppm (4th maximum)
Ouray (Uintah County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.101 ppm (4th maximum)
Roosevelt (Duchesne County)	2012	Ozone	8-hour	0.067 ppm (4th maximum)
Fruitland (Duchesne County)	2011 to 2012 (2-year average)	Ozone	8-hour	0.068 ppm (4th maximum)
Price (Carbon County)	2011 to 2012 (2-year average)	Ozone	8-hour	0.070 ppm (4th maximum)
Spanish Fork (Utah County)	2010-2012 (3-year average)	Ozone	8-hour	0.070 ppm (4th maximum)
North Provo (Utah County)	2010 to 2012 (3-year average)	Ozone	8-hour	0.071 ppm (4th maximum)
Vernal (Uintah County)	2012	Nitrogen dioxide	1-hour	102 ppb (98th percentile)

TABLE 3-7
AIR QUALITY DATA FOR UTAH

Site/Location	Year	Pollutant	Averaging Period	Concentration
Rabbit Mountain (Uintah County)	2012	Nitrogen dioxide	1-hour	12 ppb (98th percentile)
Redwash (Uintah County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	30.3 ppb (98th percentile)
	2010		Annual	3.8 ppb
Ouray (Uintah County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	29 ppb (98th percentile)
	2011 to 2012 (2-year average)		Annual	3.6 ppb
Roosevelt (Duchesne County)	2012	Nitrogen dioxide	1-hour	36 ppb (98th percentile)
Fruitland (Duchesne County)	2011 to 2012 (2-year average)	Nitrogen dioxide	1-hour	17 ppb (98th percentile)
Price (Carbon County)	2011 to 2012 (2-year average)	Nitrogen dioxide	1-hour	35 ppb (98th percentile)
North Provo (Utah County)	2010 to 2012 (3-year average)	Nitrogen dioxide	1-hour	58 ppb (98th percentile)
	2009 to 2011 (3-year average)		Annual	16.7 ppb
Rabbit Mountain (Uintah County)	2012	PM_{10}	24-hour	145 µg/m3 (2nd maximum)
Roosevelt (Duchesne County)	2012	PM_{10}	24-hour	48 µg/m3 (2nd maximum)
North Provo (Utah County)	2010 to 2012 (3-year average)	PM_{10}	24-hour	49.5 µg/m3 (2nd maximum)
Vernal (Uintah County)	2012	$PM_{2.5}$	24-hour	24 µg/m3 (98th percentile)
			Annual	7 µg/m3
Rabbit Mountain (Uintah County)	2012	$PM_{2.5}$	24-hour	17 µg/m3 (98th percentile)
			Annual	4.9 µg/m3
Roosevelt (Duchesne County)	2012	$PM_{2.5}$	24-hour	26 µg/m3 (98th percentile)
			Annual	6.4 µg/m3
Spanish Fork (Utah County)	2010 to 2012 (3-year average)	$PM_{2.5}$	24-hour	28.3 µg/m3 (98th percentile)
			Annual	7.6 µg/m3
North Provo (Utah County)	2010 to 2012 (3-year average)	$PM_{2.5}$	24-hour	28 µg/m3 (98th percentile)
			Annual	8.1 µg/m3
Bountiful (Davis County)	2010 to 2012 (3-year average)	Sulfur dioxide	1-hour	10.7 ppb (99th percentile)
Rabbit Mountain (Uintah County)	2012	Carbon monoxide	1-hour	3.8 ppm (2nd maximum)
			8-hour	1.5 ppm (2nd maximum)
North Provo (Utah County)	2010 to 2012 (3-year average)	Carbon monoxide	1-hour	2.8 ppm (2nd maximum)
			8-hour	1.9 ppm (2nd maximum)
Magna (Salt Lake County)	2010 to 2012 (3-year average)	Lead	24-hour Quarterly average not available	0.097 µg/m3 (2nd maximum)

SOURCES: Enviroinmental Protection Agency 2013a; Utah Division of Air Quality 2013
NOTES:
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
ppm = Parts per million
ppb = Parts per billion
µg/m3 = micrograms per cubic meter

3.2.1.4 Study Methodology

This section describes the methods used to calculate emissions and to estimate ambient impacts for the transmission line, series compensation stations, and concrete batch plants. The analysis of general conformity is also described. Emissions, impacts, regulatory requirements, and the results of the conformity analysis are presented in Section 3.2.1.5.

Emissions of air pollutants would occur during construction of the transmission line and series compensation stations and, to a lesser extent, during the operations phase of the transmission line and series compensation stations. This section provides the estimated amounts of criteria pollutant emissions that would occur during construction of the Project for each of the alternative routes under consideration. Where feasible, potential GHG emissions have also been quantified and reported in this section. Emissions from construction activities would be confined to daytime hours and would occur only during active construction periods. Additionally, emissions would be transient as construction progresses, so emissions would not occur in one area for a long duration, thereby limiting their impact. Ambient pollutant concentrations resulting from specific construction activities have been quantified and compared with applicable ambient standards.

In general, emissions have not been quantified for the operation of the transmission line(s) and series compensation stations, with the exception of GHG emissions from circuit breakers. During the operations phase, emissions would be limited primarily to vehicular use for routine maintenance and emergency repair activities. The sources would be similar to those from construction, but pollutants would be emitted in much smaller amounts on an annual basis; therefore, the majority of emissions and impacts would be associated with construction.

Only the No Action alternative would result in no project-related emissions or impacts. Where emissions and ambient concentrations are below EPA- or state-defined *de minimis* levels, the impacts would be considered low. More substantial emissions and impacts that do not result in potential ambient standard exceedances would be considered moderate. Potential exceedances of ambient standards would represent high impact levels.

The following categories of emission sources have been considered:

- Fugitive dust from earth moving activities associated with construction or expansion of the transmission line, series compensation stations, and concrete batch plants
- Paved and unpaved road dust associated with construction or expansion of the transmission line, series compensation stations, and concrete batch plants, as well as operation of the concrete batch plants
- Traffic (tailpipe) emissions from on-road vehicles associated with construction or expansion of the transmission line, series compensation stations, and concrete batch plants, as well as operation of the concrete batch plants
- Exhaust emissions from nonroad engines (i.e., construction equipment) associated with construction or expansion of the transmission line, series compensation stations, and concrete batch plants
- Helicopter emissions associated with construction of the transmission line
- Emissions from concrete batching operations
- Emissions of GHGs from circuit breakers at the series compensation stations

Reasonable and feasible selective mitigation measures have been incorporated into the emission estimates. Best available control measures are often defined and, in some jurisdictions, required for use in controlling fugitive dust from construction operations, as well as dust from paved and unpaved roads. The EPA has defined requirements for diesel nonroad engine emissions by model year (Tier standards). The use of Tier 3 engines, where possible, is assumed as the default for quantification of diesel equipment emissions. The on-road emission factors used in this analysis include the effects of vehicle fleet turnover in reducing tailpipe emissions over time.

3.2.1.4.1 Emission Calculation Methods

During construction, sources of PM_{10} and $PM_{2.5}$ would include grading and earthmoving associated with the development of access roads and work pad and series compensation station areas, digging and drilling to prepare for the structure foundations, constructing and operating the concrete batch plants, and vehicular traffic. Particulate matter emissions from traffic include both tailpipe emissions from fuel burning, and fugitive dust from traffic on paved and unpaved roads.

Onroad vehicles and nonroad engines (i.e., construction equipment) would release nitrogen oxides (NO_x); CO; SO_2; PM_{10}, $PM_{2.5}$, volatile organic compounds (VOC); and GHGs, including CO_2, methane (CH_4), and NO_2. Fuel combustion in helicopters would release the same pollutants.

The primary emission sources associated with the operations phase of the transmission line would include windblown dust from ground disturbance, road dust, and vehicle emissions during periodic maintenance or emergency repair activities. Additionally, the circuit breakers at each of the series compensation stations would be filled with sulfur hexafluoride (SF_6), a GHG. There would be a small amount of ongoing leakage of SF_6 over time, resulting in emissions of this pollutant.

As noted above, because operational emissions and impacts would be much lower than the construction phase emissions and impacts, operational emissions have not been quantified; with the exception of SF_6 from the circuit breakers.

Fugitive Dust from Transmission Line and Series Compensation Station Construction

Fugitive dust was estimated from construction of the transmission lines and series compensation stations. Fugitive dust emissions for construction of 5 to 6 mobile concrete batch plants, located at intervals along the transmission line right-of-way, are included in the transmission line construction emissions as part of the multi-purpose construction yards.

Uncontrolled fugitive dust emission factors of 0.42 ton PM_{10} per acre per month and 0.042 ton $PM_{2.5}$ per acre per month were used for access road construction, while uncontrolled fugitive dust emission factors of 0.11 ton PM_{10} per acre per month and 0.011 ton $PM_{2.5}$ per acre per month were used for other construction activities, including construction of the series compensation stations (Countess Environmental 2006; EPA 2001; Midwest Research Institute 2005). For the transmission line, the earthmoving and grading activities were assumed to be half for access roads and half for other activities, and average emission factors of 0.27 ton PM_{10} per acre per month and 0.027 ton $PM_{2.5}$ per acre per month were used (Countess Environmental 2006).

A control efficiency of 61 percent was assumed for watering, as needed, and application of dust suppressant, if warranted, was applied to uncontrolled emissions, based on work sponsored by the Western Regional Air Partnership (Countess Environmental 2006).

Dust from paved and unpaved roads was estimated using vehicle counts and distances travelled that were supplied by project engineers for each transmission line section and series compensation station. For the

transmission line construction, roads were assumed to be 60 percent unpaved and 40 percent paved. For series compensation station construction, roads were assumed to be 15 percent unpaved and 85 percent paved. Total vehicle miles travelled were calculated from vehicle counts and travel distances.

Emissions were calculated using spreadsheet models developed by Western Regional Air Partnership (2009) and adjusted to reflect updated EPA emission factor equations (EPA 2005a). In addition to speed control, selective mitigation measures would include dust suppressant application on unpaved roads, if warranted (i.e., when dust generation is observed despite imposition of other selective mitigation measures); frequent watering of unpaved roads (twice daily assumed); and prompt removal of dirt tracked onto paved roads.

Both earthmoving/grading fugitive dust and dust from paved and unpaved roads for transmission line and series compensation station construction were apportioned over the project duration based on relative month-by-month schedules for each activity supplied by project engineers. Emissions from construction-related fugitive dust were assumed to occur based on the expected timing of road or pad construction and foundation installation. Emissions from paved and unpaved roads were assumed to occur based on the fraction of total activities occurring in each month, since all activities have associated vehicle traffic, not just road/pad and foundation activities. The monthly emissions thus obtained were summed to provide total emissions during each year of project activity.

For transmission line construction, detailed schedules, numbers of vehicles, and miles traveled were supplied for the shortest transmission line alternative route. Final calculated fugitive dust emissions were scaled up for the other alternative routes based on the relative lengths of the alternative routes.

Construction Equipment Emissions

Nonroad engine exhaust emissions for the Project were estimated on a monthly basis, using the equipment information and schedules provided for each transmission line section and for the series compensation stations. Nonroad engine emission factors were selected based on the type and size of engine. Emission factors for criteria pollutant emissions from diesel engines were taken from federal emission standards applicable to nonroad engines (EPA 2010a), with the exception of SO_2 emission factors.

The SO_2 emission factor for diesel engines was estimated based on an equation given in EPA document NR-009A (*Exhaust Emission Factors for Nonroad Engine Modeling – Compression-Ignition*) (EPA 1998a) and the federal diesel fuel sulfur content limitation of 15 ppm. Emission factors for gasoline engines were taken from EPA document 420R-05-019 (*Exhaust Emission Factors for Nonroad Engine Modeling – Spark-Ignition*) (EPA 2005a). The SO_2 emission factor for gasoline engines was estimated based on an equation presented in EPA document NR 0010b (*Exhaust Emission Factors for Nonroad Engine Modeling – Spark Ignition*) (EPA 1999).

Assumptions made in emission factor selection and emission calculations include:

- PM emission factors were used to conservatively estimate emissions for PM_{10} and $PM_{2.5}$.
- Where available, nonmethane hydrocarbon emission factors were used to estimate VOC emissions. Where only hydrocarbon emission factors were available, these emissions were conservatively used to estimate VOC emissions.
- For diesel engines, Tier 3 was assumed.

Helicopter emissions were estimated based on hours of operation and fuel usage. An AgustaWestland AW139 (or equivalent) heavy lift helicopter was assumed for calculating steel erection emissions. An

AS 350B (or equivalent) helicopter was assumed for calculating wire installation emissions. Emission information for helicopters was obtained from the Swiss Federal Office of Civil Aviation's document *Guidance on the Determination of Helicopter Emissions, Edition 1, March 2009* (Federal Office of Civil Aviation 2009).

CO_2 emission factors for gas engines were estimated based on an equation given in the EPA document *Exhaust Emission Factors for Nonroad Engine Modeling – Spark-Ignition* (EPA 2005a). For diesel engines, the CO_2 emission factors were calculated based on an equation in EPA document NR-009d (*Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition*) (EPA 2010a). CH_4 and NO2 emission factors for gas and diesel engines, and CO_2, CH_4, and NO_2 emission factors for helicopters were obtained from *Climate Leaders Greenhouse Gas Inventory Protocol Core Module Guidance – Direct Emissions from Mobile Combustion Sources* (EPA 2008). Global warming potentials for calculating CO_2 equivalent (CO_2e) emissions from 40 CFR 98, Table A-1 were used.

Emissions for the transmission line and series compensation stations were apportioned over the project schedule. Month-by-month schedules for each activity were used to apportion the equipment emissions associated with that activity over time.

As with fugitive dust emissions, detailed equipment schedules, numbers of pieces of equipment, and hours per day operation were supplied for the shortest transmission line alternative route. Final calculated nonroad engine emissions were scaled up for the other alternative routes based on the relative lengths of the alternative routes.

Traffic Emissions

A number of support vehicles would be used during project construction, including a fleet of pickup trucks, flatbed trucks, and other vehicles such as concrete and water trucks. As each of these vehicles would emit regulated pollutants, the emissions of these pollutants were calculated using emission factors estimated by the EPA's Motor Vehicle Emission Simulator (MOVES2010b) model (EPA 2012a).

Traffic emissions from transmission line construction and series compensation station construction were calculated using vehicle types, vehicle numbers, and miles travelled as estimated for paved and unpaved road emissions, combined with emission factors from MOVES. These emission factors were applied to the various vehicle classes based on size and fuel used.

As with fugitive dust, emissions for the transmission line and the series compensation stations were apportioned over the project schedule. The relative fractions of total project activities occurring in each month were used to apportion emissions, rather than just road/pad and foundation activities, since vehicle traffic is associated with all activities involved in transmission line and series compensation station construction.

For transmission line construction, detailed schedules, numbers of vehicles, and miles traveled were supplied for the shortest transmission line alternative route. Final calculated traffic emissions were scaled up for the other alternative routes based on the relative lengths of the alternative routes.

Concrete Batch Plant Operation Emissions

Concrete batch plants would be operated to supply concrete for the project approximately every 60 miles along the right-of-way. It is expected that 3 to 4 of the batch plants will be existing concrete suppliers in communities within about 30 miles of the pour sites, while an additional 5 to 6 mobile batch plants will be needed at strategic locations along the route. Emissions generated in the construction of the mobile batch plants are included in the transmission line construction totals.

Operation emissions were based on emission factors in Section 11.12-1 of EPA's Compilation of Air Pollutant Emission Factors (AP-42) (EPA 2005b) for concrete batching operation. Emissions were based on the amount of concrete needed for the transmission line and series compensation station construction. The concrete was assumed to be truck-mixed. Emissions resulting from traffic involved in bringing raw materials to each batch plant were based on the estimated raw material loads needed to meet the concrete requirements.

Paved road emissions were estimated for batch plant operation based on the expected number of loads of raw materials delivered to the plants (paved and unpaved road emissions for delivery of concrete to the transmission line and series compensation station work sites was included in the construction emissions calculated for those activities). The number of raw material loads needed is a function of the expected cubic yards of concrete required for transmission line and series compensation station construction. Emissions resulting from traffic involved in bringing raw materials to each batch plant were based on the estimated raw material loads needed to meet the concrete requirements and emission factors from MOVES2010b (EPA 2012a). Trucks transporting raw materials to each concrete batch plant were assumed to have an average weight of 20 tons and to travel 100 miles round trip. Batch plant traffic emissions were not apportioned to months.

Series Compensation Station Emissions

The series compensation stations will include circuit breakers containing SF_6, a highly effective dielectric used for interrupting arcs. A potent GHG, SF_6 emissions from the series compensation stations would occur as a result of circuit breaker equipment leaks. A leak rate lower than 0.1 percent is obtainable for circuit breakers, even after many years of service (McDonald 2007). SF_6 emissions for each series compensation station have been calculated based on the total SF_6 content of the breakers and application of a 0.1 percent leak rate. CO_2e (equivalent) emissions have been calculated using the SF_6 global warming potential from 40 CFR 98, Table A-1.

3.2.1.4.2 Impact Assessment and Mitigation Planning

Construction activities associated with the project would release regulated pollutants into the atmosphere for subsequent transport. Some of these pollutants may be transported from the immediate area into the surrounding air. A dispersion modeling analysis was conducted to assess probable project impacts on ambient air quality.

EPA's screening-level dispersion model, AERSCREEN, was used for the analysis. AERSCREEN is a screening version of the EPA's recommended model for near field dispersion analyses, AERMOD. AERSCREEN was used to simulate emissions and transport from transmission line and series compensation station construction for those pollutants for which state or federal ambient standards have been defined. Construction of mobile concrete batch plants was not modeled because the activities are similar to those employed in series compensation station construction (grading, structure erection, etc.), but with much smaller emissions. Similarly, operation emissions from the batch plants were not modeled because they would be negligible.

For the transmission line segments, maximum PM_{10}, $PM_{2.5}$, and NO_x emissions would occur during access road construction. Maximum CO emissions from construction equipment would occur during tree-clearing activities, while maximum SO_2 emissions would occur during steel assembly. Emissions from helicopter operations, traffic, and paved and unpaved road traffic were not modeled because they would occur over a large area, resulting in negligible impacts at any given location.

Because AERSCREEN can only simulate emissions from a single source for a 1-hour time period, both fugitive dust and construction equipment emissions were modeled as being emitted from an area

representing a work site, rather than from individual pieces of equipment, with the size of the site based on expected activities. The release height was set to 10 meters, in accordance with procedures recommended by the Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division for fugitive sources with substantial turbulence (e.g., equipment activity) (CDPHE 2005). Although CDPHE guidance was developed for a previous screening model, SCREEN3, the recommendation can be reasonably applied to the newer AERSCREEN model as well.

Maximum 1 hour impacts were conservatively assumed to apply to other short-term averaging periods (i.e., 3-hour, 8-hour, and 24-hour). Annual impacts were not estimated because the equipment and other emitting activities would not stay in one location, but would move along the right-of-way as the transmission lines are constructed.

AERSCREEN requires information about the surface characteristics that may influence dispersion, including representative albedo, Bowen ratio, and surface roughness length. Maximum and minimum expected temperatures are also entered. Annual average albedo, Bowen ratio, and surface roughness for grasslands were calculated from seasonal values given in the AERMET User's Guide, Tables 4-1, 4-2a, and 4-3 (EPA 2004). Average maximum and minimum temperature data from the monitoring stations along the alternative routes were used in the modeling. Emissions from the Applicant's preferred alternative were modeled. Because the daily or hourly emissions from a single work site were modeled, impacts would apply equally to any location along the transmission line corridor and to any alternative route.

VOCs were not modeled because they are regulated as precursors to other pollutants (ozone, PM_{10}), and are generally modeled only as part of regional applications. GHG emissions were also not modeled because there are no ambient standards for GHGs, and they contribute to climate change on a global, rather than local or regional, scale.

For series compensation station construction, maximum PM_{10}, $PM_{2.5}$, SO_2, and NO_x emissions would occur during site development. Maximum emissions of CO would occur during foundation work. As with the transmission line, these activities were simulated as area sources representing a work site.

AERSCREEN calculates conservative impacts that are likely to overestimate actual impacts for several reasons. As noted above, 1-hour impacts are applied to all averaging periods. In reality, wind direction varies with time so that over longer averaging periods, the emissions plume becomes more diffuse, with lower impacts at any given location. Additionally, AERSCREEN calculates maximum impacts based on worst-case meteorological conditions. The conditions simulated include those characteristic of both daytime and nighttime, even though construction operations will only occur during the day. Nighttime conditions often lead to the highest impacts, because the atmosphere is often more stable at night; thus the emissions plume does not disperse as readily as during the day. Finally, many of the ambient standards that the impact analysis results are compared to have complicated forms that involve averaging submaximum concentrations over several years. For example, the 1-hour NO_2 standard is based on a 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour concentrations. AERSCREEN only calculates maximum, rather than submaximum, concentrations and worst-case impacts would occur in a given location in only one year as construction moves along the transmission line corridor.

Regulatory Requirements

Federal, state, and local air quality requirements regulate emissions of a large number of pollutants from various sources. Many of the regulations are aimed at stationary sources, which would include the concrete batch plants and series compensation stations, but not construction emissions. Emissions of regulated pollutants from construction operations are primarily focused on control of fugitive dust, as

outlined below. Tailpipe emissions from on- road traffic and from the nonroad engines used in construction equipment (such as cranes, bulldozers, etc.) are regulated at the federal level, through specified performance requirements for various types of engines. The burden of meeting the performance requirements is placed on manufacturers of such equipment.

GHGs are also regulated pollutants at the federal level. Federal requirements impose reporting obligations on owners of certain types of sources. Additionally, the EPA requires GHG emission inventories and control technology analyses for new or modified large sources of pollutants. None of the activities involved in the proposed project is expected to be subject to federal GHG requirements.

The regulatory requirements that would apply to activities associated with construction and operation of the transmission line, series compensation stations, and concrete batch plants are outlined below.

Transmission Line, Series Compensation Station, and Concrete Batch Plant Construction

- WAQSR Chapter 6, Permitting Requirements, requires a permit or waiver for the concrete batch plants. All permitted sources in Wyoming are required to employ Best Available Control Technology. Notifications, recordkeeping, reports, and performance tests may be required.
- Open burning of vegetative material is regulated under WAQSR Chapter 10, Smoke Management. If any waste from tree clearing will be burned in Wyoming, the requirements of this chapter must be complied with, including notification, monitoring, reporting, emission control, and registration, if applicable.
- WAQSR Chapter 13, Mobile Sources, prohibits tampering with or removing any emission control device on a motor vehicle.
- Colorado Regulation 1 (5 CCR 1001-3), Section II.C and Regulation 9 (5 CCR 1001-11) covers open burning requirements. If any waste from tree clearing will be burned in Colorado, an open burning permit must be obtained and a burn plan may be required.
- Colorado Regulation 1 (5 CCR 1001-3), Section II.D contains requirements for fugitive dust control. Requirements may apply to paved and unpaved roads, clearing or leveling of land in excess of 5 acres, haul roads and trucks, and blasting activities. A fugitive dust control plan will be required and will specify mitigation measures to be employed. Limitations that apply to various activities include no nuisance dust, no off-property transport, and no more than 20 percent opacity.
- Colorado Regulation 3 (5 CCR 1001-5), Parts A and B govern emissions reporting and preconstruction permitting for minor sources. An Air Pollutant Emission Notice and preconstruction permit is required for land development activities exceeding 25 contiguous acres or exceeding six months duration. The permit will specify fugitive dust control measures to be employed. An Air Pollutant Emission Notice and preconstruction permit may also be required for the concrete batch plants.
- UAC R307-201-3 regulates visible emissions for sources outside of PM_{10} nonattainment or maintenance areas and would apply to all portions of Utah traversed by the alternative routes except Utah County. Opacity is limited to no more than 20 or 40 percent, depending on the source and situation. The requirements apply to both stationary sources and gasoline and diesel mobile sources.
- UAC R307-201-4 prohibits tampering with or removing any emission control device on a motor vehicle and requires proper maintenance and use of such devices.

- UAC R307-204 governs open burning outside of incorporated communities. If any waste from tree clearing will be burned in Utah, the requirements of this regulation must be complied with and a burn plan may be required.
- UAC R307-205 establishes minimum work practices and emission standards for sources of fugitive dust outside of PM_{10} nonattainment or maintenance areas and would apply to all portions of Utah traversed by the alternative routes except Utah County. The regulation limits opacity, and requires control of dust from storage and handling of materials, clearing or leveling of land greater than 0.25 acre, and movement of trucks or construction equipment over cleared land greater than 0.25 acre or over access haul roads. Traffic count data may be required for roads and public or private paved roads must be cleaned promptly when materials are deposited.
- UAC R307-305 establishes reasonably available control technology requirements for PM_{10} nonattainment or maintenance areas and would apply in Utah County.
- UAC R307-309 established minimum work practices and emission standards for sources of fugitive dust in PM_{10} and $PM_{2.5}$ nonattainment or maintenance areas and would apply in Utah County. Opacity is limited to 10 to 20 percent, depending on the source and location. A fugitive dust control plan is required for storage, hauling, and handling operations, clearing or leveling 0.25 acre or more of land, earthmoving, excavation, and moving trucks or construction equipment over cleared land in excess of 0.25 acre or over access haul roads. Dust from paved and unpaved roads is also regulated.
- UAC R307-401 establishes permitting requirements for new and modified sources. A notice of intent and approval order will likely will be required for construction and relocation of the concrete batch plants.
- UAC R307-403 and R307-421 may require that any concrete batch plants located in Utah county obtain offsets.

Concrete Batch Plant Operation

The mobile concrete batch plants would be considered stationary or portable stationary sources in most air quality jurisdictions. It is assumed that the batch plants would not include any fuel burning equipment or stationary internal combustion engines, such as generators. If fuel-burning or internal combustion engines are needed, additional requirements may apply. The following requirements are potentially applicable:

- WAQSR Chapter 6, Permitting Requirements, will require a state operating permit if a preconstruction permit is issued for the concrete batch plants. All permitted sources in Wyoming are required to employ Best Available Control Technology. Notifications, recordkeeping, reports, and performance tests may be required.
- Colorado Regulation 1 (5 CCR 1001-3), Section II.A limits opacity from stationary sources to 20 to 30 percent.
- Colorado Regulation 1 (5 CCR 1001-3), Section III.C and Regulation 6 (5 CCR 1001-8), Part B, Section III.C limit particulate matter from manufacturing processes and may apply to the concrete batch plants.
- Colorado Regulation 1 (5 CCR 1001-3), Section II.D contains requirements for fugitive dust control. Requirements may apply to access roads and haul truck traffic associated with batch plant operation. A fugitive dust control plan will be required and will specify mitigation measures to be employed. Limitations that apply to various activities include no nuisance dust, no off-property transport, and no more than 20 percent opacity.

- Colorado Regulation 3 (5 CCR 1001-5), Part A requires a relocation notice for portable sources.
- UAC R307-201-3 regulates visible emissions for sources outside of PM_{10} nonattainment or maintenance areas and would apply to all portions of Utah traversed by the alternative routes except Utah County. Opacity is limited to no more than 20 or 40 percent, depending on the source and situation.
- UAC R307-205 establishes minimum work practices and emission standards for sources of fugitive dust outside of PM_{10} nonattainment or maintenance areas and would apply to all portions of Utah traversed by the alternative routes except Utah County. The regulation limits opacity, and requires control of dust from storage and handling of materials and movement of trucks over access haul roads. Traffic count data may be required for roads and public or private paved roads must be cleaned promptly when materials are deposited.
- UAC R307-305 establishes reasonably available control technology requirements for PM_{10} nonattainment or maintenance areas and would apply in Utah County.
- UAC R307-309 establishes minimum work practices and emission standards for sources of fugitive dust in PM_{10} and $PM_{2.5}$ nonattainment or maintenance areas and would apply in Utah County. Opacity is limited to 10 to 20 percent, depending on the source and location. A fugitive dust control plan is required for storage, hauling, and handling operations and moving trucks over access haul roads. Dust from paved and unpaved roads is also regulated.

Series Compensation Station Operation

The series compensation stations would be considered stationary sources in most air quality jurisdictions; however, provided the substations have no fuel burning equipment or stationary internal combustion engines, there would be few, if any, regulated emissions.

Mitigation Planning

Selective mitigation would be used to limit particulate matter emissions during both the construction and operational phases of the project. As noted in the previous section, dust control plans would be required in specific jurisdictions. Such permits or plans would detail specific mitigation measures to be applied and would be adhered to). Even where plans or permits are not required, the project would still be subject to fugitive dust control measures mandated by the applicable regulations. Following construction, disturbed areas would be reclaimed with native vegetation or seed mix prescribed by the land-management agency, which would limit ongoing fugitive dust emissions.

The following dust control measures have been specifically applied to the Project emission estimates:

- Watering at least twice daily in all disturbed areas undergoing active construction or disturbance.
- Watering all unpaved roads at least twice daily in areas of active use.
- Application of dust suppressants, if warranted, to unpaved roads and other disturbed areas (i.e., when generation of dust is observed despite application of other control measures, such as speed control and watering).
- Limitation of speeds on unpaved roads to 20 mph.
- Sweeping up tracked-out dirt where unpaved roads or disturbed areas meet paved roads every 14 days, using PM_{10} efficient street sweepers, in areas of active construction or use.

Additional selective mitigation measures may be applied in accordance with dust control plans or permits issued or approved by the various air quality control jurisdictions.

With respect to other sources and pollutants, nonroad engine emissions would be limited by using diesel equipment with Tier 3 engines. Traffic emissions explicitly incorporate the effects of ongoing federal emissions reduction requirements. Where stationary source permits or notifications are required, the project would comply with all limitations or requirements imposed by the permitting authority. Leak detection monitoring that will alert when a circuit breaker loses 10 percent of its SF_6 is proposed to mitigate GHG emissions from the series compensation stations.

General Conformity

In 1993, the EPA promulgated a rule requiring federal actions to conform to SIPs, codified at 40 CFR 93. Conformity means that a federal action will not interfere with strategies to attain the NAAQS. The Utah SIP, Section XXII, and UAC R307-115 address General Conformity by incorporating the federal rule by reference.

Federal actions responsible for air pollutant emissions within a nonattainment or maintenance area must undergo a conformity applicability analysis to determine whether a conformity determination is necessary. The only nonattainment or maintenance areas that would be traverse by any of the alternative routes are those in Utah County, Utah, which is a PM_{10} nonattainment area. Portions of Alternatives COUT-A and route variation, COUT-B, and COUT-C will cross the nonattainment area. Neither of the series compensation stations would be located in this nonattainment area; however, it is possible that one or more of the concrete batch plants would be located in this nonattainment area. A conformity analysis is required for this area.

To perform a conformity analysis, the total of project-related direct and indirect emissions (such as emissions from associated traffic) is tested against *de minimis* emission levels. The total of direct and indirect emissions should include regulated precursor substances. The definition of precursors to PM_{10} contained in 40 CFR 93 refers to "those pollutants described in the PM_{10} nonattainment area applicable SIP as significant contributors to the PM_{10} levels." The applicable SIP (Utah Division of Air Quality 2002) and Maintenance Plan (Utah Division of Air Quality 2005) for Utah County contain analyses and emission limits for NO_x and SO_2 in addition to directly emitted PM_{10}; therefore, these pollutants were incorporated in the conformity analysis. Conformity determinations are required for any federal action where the total of direct and indirect emissions exceeds the annual *de minimis* thresholds.

To calculate emissions for the conformity analysis, pollutant emissions for construction of the transmission line alternative routes that would traverse the nonattainment area were converted to a ton per mile of transmission line basis, and then multiplied by the number of miles that cross the nonattainment area. The distance within the nonattainment area ranges from 29.5 miles to 49.5 miles. The maximum 12 month emissions at any point during the project schedule were used in these calculations to provide a conservative estimate of total emissions.

Emissions from the construction of batch plants were not included. Concrete batch plants will be located approximately every 60 miles along the transmission line and existing batch plants will be used when available. Therefore, since the maximum distance through the nonattainment area was less than 60 miles, it was assumed that no mobile concrete batch plans would be necessary in Utah County.

3.2.1.5 Results

This section discusses the results of the emissions estimation and impact analyses performed for the proposed Project.

3.2.1.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists. The No Action alternative would mean that air pollutant emissions from construction equipment, Project-related traffic, earthmoving activities, construction and operation of several concrete batch plants, and leakage of GHGs from series compensation station circuit breakers would not occur.

3.2.1.5.2 Impacts Common to All Action Alternatives

This section addresses criteria pollutant and GHG emissions associated with construction of two series compensation stations, criteria and GHG emissions from operation of the concrete batch plants, GHG emissions from circuit breakers at the series compensation stations, emissions from the geotechnical investigation, and the results of the general conformity analysis.

Series Compensation Station Emissions and Impacts

Criteria pollutant and GHG emissions associated with construction of the two series compensation stations are summarized in Table 3-8 and detailed in Appendix D. GHGs expressed as CO_2e from series compensation station construction include CO_2, CH_4, and NO_2.

TABLE 3-8
EMISSIONS FOR SERIES COMPENSATION STATION CONSTRUCTION

Pollutant	Series Compensation Station 1 (tons)	Series Compensation Station 2 (tons)	Both Series Compensation Stations (tons)
Carbon monoxide	22.2	22.2	44.5
Nitrogen oxides	16.9	16.9	33.7
PM_{10}	16.3	16.3	32.5
$PM_{2.5}$	2.7	2.7	5.4
Sulfur dioxide	0.03	0.03	0.06
Volatile organic compounds	1.8	1.8	3.7
Carbon dioxide equivalent	3,129.0	3,129.0	6,258.0

NOTES:
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

Construction of the series compensation stations would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because maximum emissions from construction of the series compensation stations is expected to occur over only a 40-day period for each station.

As discussed in Section 3.2.2.4.1, the series compensation stations will include circuit breakers containing SF_6, a highly effective dielectric used for interrupting arcs. SF_6 emissions from the series compensation

stations would occur as a result of circuit breaker equipment leaks. These emissions are summarized in Table 3-9.

TABLE 3-9
SULFUR HEXAFLUORIDE (SF_6) EMISSIONS FOR SERIES COMPENSATION STATION OPERATION

Location	Number of Circuit Breakers	SF_6 Emissions (tons per year)	Carbon Dioxide Equivalent Emissions (tons per year)
Series Compensation Station 1	2	1.04E-03	24.78
Series Compensation Station 1	2	1.04E-03	24.78
Both Series Compensation Stations	4	2.07E-03	49.57

Concrete Batch Plant Operation Emissions

Table 3-10 shows the estimated emissions from operation of the concrete batch plants needed for the transmission line foundations (construction emissions associated with the mobile batch plants are included in transmission line emissions detailed in Section 3.2.1.5.4). Emissions include particulate matter emissions from the batching operation itself, dust from paved roads used to bring raw materials to the batch plant, tailpipe emissions from raw material deliveries, and emissions from diesel generators used to provide power to the mobile batch plants. GHGs expressed as CO_2e include CO_2, CH_4, and NO_2.

There would be slight variations in the amount of concrete needed between alternative routes. Therefore, emissions between the various alternative routes would vary as shown by the ranges of emissions listed in Table 3-10. Estimated emissions associated with the concrete needed for foundations for the two series compensations stations are also shown in Table 3-10.

TABLE 3-10
EMISSIONS FROM CONCRETE BATCH PLANT OPERATION

Pollutant	Batching Operations (tons)	Paved Roads (tons)	Onroad Traffic (tons)	Diesel Generators (tons)	Total (tons)	Tons/Mile of Transmission Line
Transmission Line[1]						
Carbon monoxide	–	–	0.64 to 0.85	68.23 to 91.22	68.86 to 92.07	0.170
Nitrogen Oxides	–	–	1.58 to 2.11	118.08 to 157.88	119.66 to 159.99	0.295
PM_{10}	0.79 to 1.06	1.03 to 1.37	0.11 to 0.14	3.94 to 5.26	5.86 to 7.84	0.014
$PM_{2.5}$	0.79 to 1.06	0.25 to 0.34	0.08 to 0.11	3.94 to 5.26	5.06 to 6.76	0.012
Sulfur dioxide	–	–	0.004 to 0.005	0.13 to 0.17	0.13 to 0.18	0.0003
Volatile organic compounds	–	–	0.17 to 0.22	7.87 to 10.53	8.04 to 10.75	0.020
Carbon dioxide equivalent	–	–	572 to 765	14,037 to 18,768	14,609 to 19,533	36.071
Series Compensation Stations[2]						
Carbon monoxide	–	–	0.10	–	0.10	–
Nitrogen Oxides	–	–	0.25	–	0.25	–
PM_{10}	0.13	0.16	0.02	–	0.31	–
$PM_{2.5}$	0.13	0.04	0.01	–	0.18	–

TABLE 3-10 EMISSIONS FROM CONCRETE BATCH PLANT OPERATION						
Pollutant	**Batching Operations (tons)**	**Paved Roads (tons)**	**Onroad Traffic (tons)**	**Diesel Generators (tons)**	**Total (tons)**	**Tons/Mile of Transmission Line**
Sulfur dioxide	–	–	0.0007	–	0.0007	–
Volatile organic compounds	–	–	0.03	–	0.03	–
Carbon dioxide equivalent	–	–	91.12	–	91.12	–

NOTES:
[1]Range shown represents variation between alternative routes based on different transmission line lengths.
[2]Emissions shown are for both series compensation stations.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

Geotechnical Investigation

A geotechnical investigation is planned to collect information regarding subsurface stability, which will be used in the final design of each transmission tower structure and foundation. The geotechnical investigation will consist of drilling and sampling soils to a typical depth of 50 to 60 feet below the existing ground surface. The boreholes would have a diameter of approximately 8 inches and would typically be backfilled with auger cuttings and on-site soils. Access roads and overland access routes as designed for the final right-of-way will be used. In some cases, helicopter-transported drill rigs may be used for geotechnical exploration in areas where existing roads do not provide adequate access or where overland travel is prohibited.

The geotechnical investigation will be completed before construction commences on either the transmission line or either of the series compensation stations; therefore, emissions from the geotechnical investigation will not overlap in time or space with emissions from other Project construction activities.

Geotechnical investigations will be conducted at the series compensation locations and along the transmission line right of way. The series compensation station geotechnical exploration program will consist of drilling approximately 12 borings at each series compensation station location. The series compensation station borings will be drilled using a truck-mounted drill rig.

The drilling exploration for the transmission line will consist of approximately 270 boring locations based on a maximum spacing of no more than 3 miles. Approximately 1.5 holes per day will be drilled, which will require a minimum of approximately 200 days for drilling based on a 5-day work week. Geotechnical drilling will be accomplished using a variety of drilling methods that are dependent on access and the type of soil and rock anticipated within the completion depth of the boring. At least two drill rigs will be employed. Drill sites with no available access will use aerial mobilization and demobilization of drilling equipment to the drill site locations.

Emissions from the geotechnical investigation will include fugitive dust from ground disturbance activities, tailpipe emissions from traffic, helicopter emissions, and emissions from nonroad engines associated with drill rigs and other equipment. Emissions from the geotechnical investigation have not been quantified but would be qualitatively similar to those expected from transmission line and series compensation station construction but at a reduced level.

General Conformity

The total of direct and indirect emissions calculated for construction of the transmission line alternative routes that cross the Utah County, Utah PM_{10} nonattainment area was compared with conformity determination thresholds (*de minimis* levels) to determine whether additional analysis was required. The estimated emissions in each area are shown in Table 3-11. Because less than 50 miles of transmission line would cross the nonattainment area for any of the alternative routes, it was assumed that all PM_{10} emissions in the nonattainment area would occur within a 12-month period. Estimated emission totals for each of the three alternative routes that cross the Utah County nonattainment area are above the *de minimis* levels (100 tons per year of the pollutant for which the area is nonattainment or maintenance) due primarily to unpaved road emissions. If any of these alternative routes is chosen, a conformity determination will be required.

TABLE 3-11
GENERAL CONFORMITY ANALYSIS

Alternative route	Maximum Miles in Nonattainment Area	Total of Direct and Indirect PM_{10} Emissions (tons)	Conformity *de minimis* Levels (tons per year)
Conventional Steel Erection Option			
COUT-A	29.7	1,207	100
COUT-B	47.2	1,918	100
COUT-C	49.2	2,003	100
Steel Erection Using Helicopters Option			
COUT-A	29.7	1,185	100
COUT-B	47.2	1,882	100
COUT-C	49.2	1,965	100

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

3.2.1.5.3 345-kilovolt Ancillary Transmission Components

Separate impacts have not been analyzed for the 345kV ancillary transmission components. Instead, climate and air quality impacts for these components are included in Sections 3.2.1.5.2 and 3.2.1.5.4.

3.2.1.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment

The climate and existing air quality in the vicinity of Alternative WYCO-B and route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative WYCO-B and route variations will not traverse any nonattainment or maintenance areas. The closest area afforded Class I air quality protection in Wyoming is the Savage Run Wilderness Area, located approximately 41 miles from the transmission line right-of-way. In Colorado, Dinosaur National Monument is the nearest protected Class II area to Alternative WYCO-B and route variations which would not cross the access road (Deerlodge Road) for the national monument.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative WYCO-B or one of the route variations are summarized in Table 3-12 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-12
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-B AND ROUTE VARIATIONS

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	29.9	62.7	7.7	100.3	0.49
Nitrogen oxides	30.2	64.2	8.0	102.4	0.50
PM_{10}	2,574.1	4,731.5	965.8	8,271.4	40.45
$PM_{2.5}$	260.7	479.5	97.6	837.8	4.10
Sulfur dioxide	0.2	0.7	0.1	1.0	0.01
Volatile organic compounds	2.9	7.2	1.0	11.1	0.05
Carbon dioxide equivalent	7,042.5	15,127.7	2,001.7	24,172.0	118.20
Steel Erection Using Helicopters Option[1]					
Carbon monoxide	29.9	51.6	6.2	87.7	0.43
Nitrogen oxides	31.0	53.2	6.5	90.7	0.44
PM_{10}	2,652.1	4,565.1	896.1	8,113.3	39.67
$PM_{2.5}$	268.5	462.2	90.5	821.2	4.02
Sulfur dioxide	0.4	0.7	0.1	1.2	0.01
Volatile organic compounds	3.7	6.4	0.9	11.0	0.05
Carbon dioxide equivalent	7,541.6	12,925.6	1,692.6	22,159.8	108.36

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative WYCO-B or one of the route variations are also shown in Appendix D. As with the series compensation stations, construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment

The climate and existing air quality in the vicinity of Alternative WYCO-C and route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative WYCO-C and route variations will not traverse any nonattainment or maintenance areas. The closest area afforded Class I air quality protection in Wyoming is the Savage Run Wilderness Area, located approximately 41 miles from the transmission line right-of-way. In Colorado, Dinosaur National Monument is the nearest protected Class II area to the WYCO-B alternative routes and the alternative routes would not cross the access road (Deerlodge Road) for the national monument.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative WYCO-C or one of the route variations are summarized in Table 3-13 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-13
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C AND ROUTE VARIATIONS

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	30.8	64.5	7.9	103.2	0.49
Nitrogen oxides	31.1	66.0	8.2	105.4	0.50
PM_{10}	2,647.6	4,867.0	993.7	8,508.2	40.44
$PM_{2.5}$	268.1	493.3	100.4	861.9	4.10
Sulfur dioxide	0.2	0.8	0.1	1.1	0.01
Volatile organic compounds	3.0	7.4	1.0	11.4	0.05
Carbon dioxide equivalent	7,245.7	15,564.2	2,059.5	24,869.3	118.20
Steel Erection Using Helicopters Option					
Carbon monoxide	30.7	53.1	6.4	90.2	0.43
Nitrogen oxides	31.9	54.7	6.7	93.3	0.44
PM_{10}	2,727.8	4,695.9	921.9	8,345.6	39.67
$PM_{2.5}$	276.2	475.5	93.1	844.8	4.02
Sulfur dioxide	0.4	0.7	0.1	1.3	0.01
Volatile organic compounds	3.8	6.6	0.9	11.3	0.05
Carbon dioxide equivalent	7,759.2	13,298.5	1,741.5	22,799.1	108.36

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative WYCO-C or one of the route variations are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project

construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment

The climate and existing air quality in the vicinity of Alternative WYCO-D or route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative WYCO-D and route variations will not traverse any nonattainment or maintenance areas. The closest area afforded Class I air quality protection in Wyoming is the Savage Run Wilderness Area, located approximately 41 miles from the transmission line right-of-way. In Colorado, the Mount Zirkel Wilderness Area (34 miles), the Flat Tops Wilderness Area (26 miles), and Dinosaur National Monument (1 mile) are the nearest Class I or protected Class II areas to the WYCO-D alternative routes.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative WYCO-D or the route variations are summarized in Table 3-14 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-14
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D AND ROUTE VARIATIONS

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	36.6	76.6	9.4	122.6	0.49
Nitrogen oxides	37.0	78.5	9.7	125.2	0.50
PM_{10}	3,144.8	5,781.7	1,180.7	10,107.2	40.43
$PM_{2.5}$	318.5	586.0	119.3	1,023.8	4.10
Sulfur dioxide	0.2	0.9	0.1	1.3	0.01
Volatile organic compounds	3.6	8.7	1.2	13.5	0.05
Carbon dioxide equivalent	8,609.4	18,493.6	2,447.1	29,550.1	118.2
Steel Erection Using Helicopters Option					
Carbon monoxide	36.5	63.1	7.6	107.2	0.43
Nitrogen oxides	37.9	65.0	7.9	110.8	0.44
PM_{10}	3,240.1	5,578.4	1,095.4	9,913.9	39.66
$PM_{2.5}$	328.1	564.8	110.7	1,003.6	4.01
Sulfur dioxide	0.5	0.9	0.1	1.5	0.01
Volatile organic compounds	4.5	7.8	1.1	13.4	0.05
Carbon dioxide equivalent	9,219.6	15,801.4	2,069.2	27,090.2	108.36

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative WYCO-D or the route variation are also shown in Appendix D. Construction of the transmission line would result in

the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment

The climate and existing air quality in the vicinity of Alternative WYCO-F and route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative WYCO-F and route variations will not traverse any nonattainment or maintenance areas. The closest area afforded Class I air quality protection in Wyoming is the Savage Run Wilderness Area, located approximately 41 miles from the transmission line right-of-way. In Colorado, Dinosaur National Monument is the nearest protected Class II area to Alternative WYCO-F and the route variations would not cross the access road (Deerlodge Road) for the national monument.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative WYCO-F or one of the route variations are summarized in Table 3-15 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-15
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION
FOR ALTERNATIVE WYCO-F AND ROUTE VARIATIONS

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	32.0	67.1	8.3	107.4	0.49
Nitrogen oxides	32.4	68.7	8.5	109.6	0.50
PM_{10}	2,754.2	5,063.2	1,033.8	8,851.2	40.43
$PM_{2.5}$	278.9	513.2	104.5	896.6	4.10
Sulfur dioxide	0.2	0.8	0.1	1.1	0.01
Volatile organic compounds	3.1	7.7	1.1	11.9	0.05
Carbon dioxide equivalent	7,538.4	16,193.0	2,142.7	25,874.0	118.2

TABLE 3-15 EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F AND ROUTE VARIATIONS					
Pollutant	**Year 1 (tons)**	**Year 2 (tons)**	**Year 3 (tons)**	**Total (tons)**	**Tons/Mile of Transmission Line**
Steel Erection Using Helicopters Option					
Carbon monoxide	32.0	55.2	6.7	93.9	0.43
Nitrogen oxides	33.2	56.9	6.9	97.0	0.44
PM_{10}	2,837.7	4,885.2	959.1	8,682.0	39.66
$PM_{2.5}$	287.3	494.6	96.9	878.9	4.01
Sulfur dioxide	0.5	0.8	0.1	1.3	0.01
Volatile organic compounds	3.9	6.9	0.9	11.7	0.05
Carbon dioxide equivalent	8,072.6	13,835.7	1,811.8	23,720.2	108.36

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative WYCO-F or one of the route variations are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Alternative COUT BAX-B

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT BAX-B are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT BAX-B will not traverse any nonattainment or maintenance areas. The closest Class I area in Colorado is the Colorado National Monument, located approximately16 miles from the transmission line right-of-way. In Utah, Arches National Park is located approximately 8 miles from Alternative COUT BAX-B.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT BAX-B are summarized in Table 3-16 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT BAX-B are also shown in Appendix D. Construction of the transmission line would result in the

dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

TABLE 3-16
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	71.6	161.1	24.1	256.8	0.92
Nitrogen oxides	35.5	105.6	25.2	166.3	0.60
PM_{10}	3,471.4	6,508.4	1,344.6	11,324.3	40.56
$PM_{2.5}$	351.9	661.7	136.7	1,150.3	4.12
Sulfur dioxide	0.2	1.0	0.4	1.5	0.01
Volatile organic compounds	6.5	16.2	3.3	25.9	0.09
Carbon dioxide equivalent	8,299.1	25,336.8	6,294.9	39,930.8	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	71.3	153.2	23.9	248.4	0.89
Nitrogen oxides	35.2	99.0	24.9	159.0	0.57
PM_{10}	3,577.8	6,281.7	1,249.4	11,109.0	39.79
$PM_{2.5}$	362.6	638.5	127.1	1,128.1	4.04
Sulfur dioxide	0.2	1.3	0.4	1.8	0.01
Volatile organic compounds	6.4	16.8	3.2	26.4	0.09
Carbon dioxide equivalent	8,235.1	24,106.1	5,291.0	37,632.2	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

Alternative COUT BAX-C

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT BAX-C are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT BAX-C will not traverse any nonattainment or maintenance areas. The closest Class I area in Colorado is the Colorado National Monument, located approximately 16 miles from the transmission line right-of-way. In Utah, Arches National Park is located approximately 8 miles from Alternative COUT BAX-C.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT BAX-C are summarized in Table 3-17 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-17
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	74.3	167.2	25.0	266.5	0.92
Nitrogen oxides	36.9	109.6	26.1	172.6	0.60
PM_{10}	3,599.6	6,748.6	1,394.7	11,743.0	40.53
$PM_{2.5}$	364.9	686.1	141.8	1,192.8	4.12
Sulfur dioxide	0.2	1.0	0.4	1.6	0.01
Volatile organic compounds	6.7	16.8	3.4	26.9	0.09
Carbon dioxide equivalent	8,611.2	26,289.7	6,531.6	41,432.5	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	73.9	159.0	24.8	257.7	0.89
Nitrogen oxides	36.5	102.7	25.8	165.0	0.57
PM_{10}	3,710.1	6,513.4	1,296.0	11,519.5	39.76
$PM_{2.5}$	376.0	662.0	131.8	1,169.8	4.04
Sulfur dioxide	0.2	1.3	0.4	1.9	0.01
Volatile organic compounds	6.7	17.4	3.4	27.4	0.09
Carbon dioxide equivalent	8,544.8	25,012.7	5,489.9	39,047.4	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT BAX-C are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative COUT BAX-E

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT BAX-E are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT BAX-E will not traverse any nonattainment or maintenance

areas. The closest Class I area in Colorado is the Colorado National Monument, located approximately 16 miles from the transmission line right-of-way. In Utah, Arches National Park is located approximately 8 miles from Alternative COUT BAX-E.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT BAX-E are summarized in Table 3-18 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-18
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	74.7	168.2	25.2	268.1	0.92
Nitrogen oxides	37.1	110.3	26.3	173.7	0.60
PM_{10}	3,618.0	6,782.4	1,402.6	11,803.0	40.49
$PM_{2.5}$	366.8	689.6	142.6	1,198.9	4.11
Sulfur dioxide	0.2	1.0	0.4	1.6	0.01
Volatile organic compounds	6.7	16.9	3.4	27.0	0.09
Carbon dioxide equivalent	8,664.7	26,453.0	6,572.2	41,690.0	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	74.4	159.9	25.0	259.3	0.89
Nitrogen oxides	36.8	103.3	26.0	166.0	0.57
PM_{10}	3,729.1	6.545.8	1,303.3	11,578.2	39.72
$PM_{2.5}$	377.9	665.3	132.5	1,175.8	4.03
Sulfur dioxide	0.2	1.3	0.4	1.9	0.01
Volatile organic compounds	6.7	17.5	3.4	27.6	0.09
Carbon dioxide equivalent	8,597.9	25,168.1	5,524.0	39,290.1	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT BAX-E alternative route are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT-A and route variation are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT-A and route variation will not traverse any nonattainment or maintenance areas in Colorado but will cross the Utah County PM_{10} nonattainment area in Utah (29.5 to 29.7 miles in the nonattainment area). The closest protected Class II area is the Dinosaur National Monument in Colorado, located approximately1 mile from the transmission line right-of-way.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT-A or route variations are summarized in Table 3-19 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-19
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ROUTE VARIATION

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	52.8	118.9	17.8	189.5	0.92
Nitrogen oxides	26.2	77.9	18.6	122.7	0.60
PM_{10}	2,567.4	4,814.3	933.3	8,375.0	40.66
$PM_{2.5}$	260.3	489.4	100.9	850.7	4.13
Sulfur dioxide	0.1	0.7	0.3	1.1	0.01
Volatile organic compounds	4.8	11.9	2.4	19.1	0.09
Carbon dioxide equivalent	6,123.3	18,694.1	4,644.5	29,461.9	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	52.6	113.0	17.6	183.2	0.89
Nitrogen oxides	26.0	73.0	18.3	117.3	0.57
PM_{10}	2,645.9	4,647.1	923.1	8,216.1	39.88
$PM_{2.5}$	268.2	472.3	93.9	834.3	4.05
Sulfur dioxide	0.1	1.0	0.3	1.3	0.01
Volatile organic compounds	4.7	12.4	2.4	19.5	0.09
Carbon dioxide equivalent	6,076.0	17,786.1	3,903.8	27,765.9	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT-A or route variation are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-

hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT-B and route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT-B and route variations will not traverse any nonattainment or maintenance areas in Colorado but will cross the Utah County PM_{10} nonattainment area in Utah (45.6-49.2 miles in the nonattainment area). The portions of Utah County relevant to the county's nonattainment designation are the heavily populated areas located west of the Wasatch Range, while the proposed transmission line route in Utah County would generally traverse the less populated areas of the county. The closest protected Class II area is the Dinosaur National Monument in Colorado, located approximately 1 mile from the transmission line right-of-way.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT-B or route variations are summarized in Table 3-20 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-20
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B AND ROUTE VARIATIONS

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	55.4	124.7	18.6	198.7	0.92
Nitrogen oxides	27.5	81.7	19.5	128.7	0.60
PM_{10}	2,691.0	5,046.0	1,041.3	8,778.3	40.64
$PM_{2.5}$	272.8	513.0	105.8	891.6	4.13
Sulfur dioxide	0.1	0.8	0.3	1.2	0.01
Volatile organic compounds	5.0	12.5	2.5	20.0	0.09
Carbon dioxide equivalent	6,420.5	19,601.6	4,870.0	30,892.0	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	55.1	118.5	18.5	192.1	0.89
Nitrogen oxides	27.2	76.6	19.2	123.0	0.57
PM_{10}	2,773.4	4,870.6	967.7	8,611.7	39.87
$PM_{2.5}$	281.1	495.0	98.4	874.5	4.05
Sulfur dioxide	0.1	1.0	0.3	1.4	0.01

TABLE 3-20 EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B AND ROUTE VARIATIONS					
Pollutant	**Year 1 (tons)**	**Year 2 (tons)**	**Year 3 (tons)**	**Total (tons)**	**Tons/Mile of Transmission Line**
Volatile organic compounds	5.0	13.0	2.5	20.4	0.09
Carbon dioxide equivalent	6,371.0	18,649,5	4,093.3	29,113.7	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT-B or route variations are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT-C and route variations are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT-C and route variations will not traverse any nonattainment or maintenance areas in Colorado but will cross the Utah County PM_{10} nonattainment area in Utah (45.6-49.2 miles in the nonattainment area). The closest protected Class II area is the Dinosaur National Monument in Colorado, located approximately 1 mile from the transmission line right-of-way.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT-C or route variations are summarized in Table 3-21 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-21 EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C AND ROUTE VARIATIONS					
Pollutant	**Year 1 (tons)**	**Year 2 (tons)**	**Year 3 (tons)**	**Total (tons)**	**Tons/Mile of Transmission Line**
Conventional Steel Erection Option					
Carbon monoxide	53.8	121.1	18.1	193.0	0.92
Nitrogen oxides	26.7	79.4	18.9	125.0	0.60
PM_{10}	2,618.8	4,911.2	1,012.3	8,542.3	40.72
$PM_{2.5}$	265.5	499.3	102.9	867.6	4.14
Sulfur dioxide	0.1	0.7	0.3	1.1	0.01
Volatile organic compounds	4.9	12.1	2.5	19.5	0.09
Carbon dioxide equivalent	6,236.2	19,038.9	4,730.2	30,005.3	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	53.5	115.1	18.0	186.6	0.89
Nitrogen oxides	26.5	74.4	18.7	119.5	0.57
PM_{10}	2,698.8	4,740.9	940.9	8,380.5	39.95
$PM_{2.5}$	273.5	481.8	95.7	851.0	4.06
Sulfur dioxide	0.1	1.0	0.3	1.4	0.01
Volatile organic compounds	4.8	12.6	2.4	19.9	0.09
Carbon dioxide equivalent	6,188.1	18,114.1	3,975.8	28,278.1	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT-C or route variations are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT-H are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. The COUT-H alternative routes will not traverse any nonattainment or maintenance areas. The closest protected Class II area is the Dinosaur National Monument in Colorado, located approximately 1 mile from the transmission line right-of-way.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT-H are summarized in Table 3-22 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-22
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	51.4	115.8	17.3	184.5	0.92
Nitrogen oxides	25.5	75.9	18.1	119.5	0.60
PM_{10}	2,499.6	4,687.1	967.1	8,153.8	40.65
$PM_{2.5}$	253.4	476.5	98.3	828.2	4.13
Sulfur dioxide	0.1	0.7	0.3	1.1	0.01
Volatile organic compounds	4.6	11.6	2.4	18.6	0.09
Carbon dioxide equivalent	5,962.7	18,204.1	4,522.8	28,689.6	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	51.2	110.1	17.2	178.4	0.89
Nitrogen oxides	25.3	71.1	17.9	114.3	0.57
PM_{10}	2,576.1	4,524.2	898.8	7,999.1	39.88
$PM_{2.5}$	261.1	459.8	91.4	812.3	4.05
Sulfur dioxide	0.1	0.9	0.3	1.3	0.01
Volatile organic compounds	4.6	12.0	2.3	19.0	0.09
Carbon dioxide equivalent	5,916.8	17,319.8	3,801.5	27,038.0	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT-H are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

Alternative COUT-I

Affected Environment

The climate and existing air quality in the vicinity of Alternative COUT-I are discussed in Sections 3.2.1.3.1 and 3.2.1.3.3. Alternative COUT-I will not traverse any nonattainment or maintenance areas.

The closest protected Class II area is the Dinosaur National Monument in Colorado, located approximately 1 mile from the transmission line right-of-way.

Environmental Consequences

Criteria pollutant and GHG emissions associated with construction of Alternative COUT-I are summarized in Table 3-23 and detailed in Appendix D. GHGs expressed as CO_2e from transmission line construction include CO_2, CH_4, and NO_2.

TABLE 3-23
EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Total (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option					
Carbon monoxide	61.6	139.1	20.7	221.4	0.92
Nitrogen oxides	30.6	91.5	21.6	143.8	0.60
PM_{10}	2,992.0	5,610.4	1,157.8	9,760.3	40.63
$PM_{2.5}$	303.3	570.4	117.7	991.4	4.13
Sulfur dioxide	0.1	0.9	0.3	1.4	0.01
Volatile organic compounds	5.6	14.3	2.8	22.6	0.09
Carbon dioxide equivalent	7,139.8	22,067.0	5,415.6	34,353.1	143.02
Steel Erection Using Helicopters Option					
Carbon monoxide	61.3	131.8	20.6	213.7	0.89
Nitrogen oxides	30.3	85.1	21.4	136.8	0.57
PM_{10}	3,083.6	5,415.4	1,076.0	9,575.0	39.86
$PM_{2.5}$	312.5	550.4	109.4	972.3	4.05
Sulfur dioxide	0.1	1.1	0.3	1.6	0.01
Volatile organic compounds	5.5	14.4	2.8	22.7	0.09
Carbon dioxide equivalent	7,084.8	20,738.9	4,551.9	32,375.5	134.79

NOTES:
Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers

The results of the air pollutant dispersion modeling conducted for construction of Alternative COUT-I are also shown in Appendix D. Construction of the transmission line would result in the dispersion of emissions of criteria pollutants generated from construction equipment, vehicles, and fugitive dust. Overall, impacts on air quality from Project construction would be temporary, localized to the vicinity of the activity (maximum impacts would occur within a few hundred feet), and would disperse quickly or settle. Most of the predicted ambient concentrations from construction would be within all standard limitations. However, the screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment to be used during Project construction. However, based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of sub-maximum concentrations, while the model only predicts maximum concentrations over a 1-hour time period. An exceedance of the standard is unlikely because Project construction will not occur in the same place over multiple years.

3.2.2 Earth Resources

3.2.2.1 Introduction and Regulatory Framework

This section describes the existing condition of earth resources in the alternative route study corridors, and addresses potential effects on vegetation resources that could result from construction, operation, and maintenance of the Project.

3.2.2.1.1 Geologic Hazards

Geologic hazards generally consist of Quaternary faults, seismicity (earthquakes), steep terrain, landslide susceptibility, subsidence, and flooding. Earthquakes are the surface expression of large energy releases that result from motion along faults. Quaternary faults are considered active and, are likely to have earthquakes occur along their length. The U.S. Geological Survey (USGS) defines seismicity as the probability of an area being affected by a damaging earthquake and is measured as the probability of a certain degree of ground shaking in terms of the percentage of acceleration due to gravity (Paterson et al. 2008). In accordance with the NESC, the Applicant is required to consider the potential for seismic activity in the design of transmission structures and facilities, and must construct any structures and facilities to withstand seismic forces.

Landslides are defined as the downward and outward movement of earth materials on a slope through the falling, sliding, or flowing of rock or soil that is the result of slope failure, which may be a result of ground saturation and/or ground shaking (Radbruch-Hall et al. 1982). In the Wyoming Basin Province, Tertiary lakebeds, and other continental deposits of the Green River and Wasatch formations have been involved in considerable sliding and flowage; in the High Plateaus of the Utah Division of the Middle Rocky Mountains Province, slumps and flows are common where softer rocks are interbedded or overlain by more resistant rocks (Radbruch-Hall et al. 1982). Slumps and flows are especially common along steep outcrops of the Cretaceous and Paleocene North Horn Formation and the Paleocene Green River Formation.

Flooding would affect the Project by destabilizing the land surface and potentially damaging towers and access roads.

Subsidence is defined as the local lowering of the Earth's surface caused by subsurface removal or compaction of material (Dunrud and Osterwald 1980). Subsidence could affect the Project by damaging towers or access roads.

It is possible that construction of the Project could increase susceptibility to geological hazards in some areas (e.g., in areas with slumps and flows). Avoidance of geologic hazards and engineering constraints criteria were applied in the Applicant's identification of feasible corridors for the siting and construction of transmission lines as part of the design features of the Proposed Action.

The protection of transmission lines from landslides, unstable soils, flooding, and other hazards is regulated by 49 CFR 192.317, which states "The operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads."

3.2.2.1.2 Soil Resources

Soils are the interface between the lithosphere (Earth's crust) and the biosphere (Earth's surface), and consist of various mineral or organic horizons of differing thickness formed by physical and chemical processes from mineralogical and biological sources (Birkeland 1999). Agency objectives for managing

soil resources center on the preservation of the natural properties of the resource, including soil productivity and surface stability.

In addition to the requirements of NEPA and FLPMA, the Farmland Protection Policy Act of 1981 requires the assessment of impacts on designated farmland soils from proposed conversion of farmlands to nonagricultural uses.

3.2.2.1.3 Mineral Resources

In this analysis, mineral resources are divided into three broad categories: locatable, leasable, and salable. Locatable minerals include rocks that bear precious stones such as diamonds or sapphires and a broad category of economically important minerals such as precious and base metals (e.g., gold, silver, and lead); and industrial minerals. Leasable resources typically are extracted for use in energy production and include oil, natural gas, coal, fissionable (e.g., uranium), and geothermal deposits. Leasable mineral resources on federal lands require a lease of set duration with the government for extraction or development. Salable mineral resources typically are used for construction and industrial purposes and include sand, gravel, stone, pumice, and cinders. Salable mineral resources may be acquired from federally owned or managed lands via a permit or contract or through small-scale methods such as recreational rock collecting.

NEPA and FLPMA serve as the primary legislation requiring assessment and mitigation of potential impacts on mineral resources when considering proposals for major actions on federally administered land.

3.2.2.2 Issues Identified for Analysis

General concern regarding potential impacts on earth resources was expressed as an issue during agency and public scoping for the Project.

3.2.2.2.1 Geologic Hazards

Impacts resulting from geologic hazards are generally restricted to the local geography of the Project. Potential effects on the Project would occur from landslides where the Project crosses steep, unstable slopes; from flooding where the Project is located within a floodplain; and from Quaternary faults where the Project crosses them. Impacts on the Project resulting from geological hazards are discussed in detail in Section 3.2.2.5.

3.2.2.2.2 Soil Resources

Impacts on soil resources resulting from the Project are associated with ground-disturbing activities that could potentially result in the removal or mixture of the surface soil horizons, loss of soil-stabilizing vegetation, compaction of soils, or the permanent conversion of designated Prime or Unique farmland soils to nonagricultural use. Impacts on soil resources resulting from the Project are discussed in detail in Section 3.2.2.5.

3.2.2.2.3 Mineral Resources

Impacts on mineral resources resulting from the Project are associated with the restriction of access for the extraction of a given mineral resource and potentially would occur in areas where the Project is located in proximity to mineral resource development such as mines, sand and gravel pits, and oil and gas well fields. Impacts on mineral resources resulting from the Project are discussed in detail in Section 3.2.2.5.

3.2.2.3 Regional Setting

The Project crosses the Wyoming Basin and Middle Rocky Mountain physiographic provinces of the Rocky Mountains Division in Wyoming, Colorado, and Utah; the Uinta Basin, Canyon Lands, and High Plateaus of Utah sections of the Colorado Plateaus Province; and the Great Basin section of the Basin and Range Province of the Intermontane Plateaus division in Colorado and Utah (Fenneman and Johnson 1946).

Quaternary faults are most commonly crossed by the Project in Utah; the potential for landslides is highest where mountainous areas are crossed by the Project in Colorado and Utah; and the potential for flooding occurs throughout the Project area where crossing of waterbodies, rivers, or streams is necessary.

Soil resources that exhibit a wide range of properties (e.g., susceptibility to water and/or wind erosion) occur at the land surface and immediate subsurface throughout the entire Project area.

Mineral resources are common throughout the Project area. Active mines (e.g., coal) occur in Wyoming, Colorado, and Utah, with a specific concentration in the vicinity of Huntington, Utah. Oil and gas wells and leases are concentrated in a number of structural basins within the Project area, including the Greater Green River Basin (Wyoming) and the Uinta Basin (Utah). Other mineral resources have the potential to occur intermittently throughout the Project area, including mining claims for locatable and salable minerals.

3.2.2.4 Study Methodology

3.2.2.4.1 Inventory

Geologic Hazards

Information regarding geologic hazards was obtained from the scientific literature and discussions with resource specialists at the BLM, USGS, USFS, Wyoming Department of Environmental Quality (WDEQ), Wyoming Geological Survey, Colorado Geological Survey, Utah Geological Survey, University of Utah seismograph stations, and the National Pipeline Mapping System. Geological units in the Project area were identified from geological maps (Green 1992; Green and Drouilard 1994; Hintze et al. 2000; USGS 2005); fault data were compiled from USGS Atlas-Digital Library (USGS 2012a); earthquake data from 1973 to the present were acquired from the National Earthquake Information Center (NEIC) (USGS 2012b); and landslide and flood data were derived from the mapping system used for the National Pipeline Hazard Index. The geologic hazards identified for the Project are shown in MV-2.

Soil Resources

Information for the soil inventory was obtained primarily from the Natural Resources Conservation Service (NRCS) (Web Soil Survey) and the USFS. Soils within the Project area were mapped by the NRCS at two different scales of resolution: (1) the smaller-scale State Soil Geographic Database (STATSGO) and (2) the larger-scale Soil Survey Geographic Database (SSURGO). Additional soil resource data were provided by the USFS TEAMS enterprise for select portions of USFS-administered land in Utah. If SSURGO or USFS data were unavailable for portions of the study corridor, smaller-scale data from the STATSGO database were used. These areas only include data for zones susceptible to wind erosion. The soil resources identified for the Project are shown in MV-3.

Mineral Resources

Areas with active mining claims, mineral material sites, oil and gas leases, coal leases, and geothermal leases in the study corridors were identified using the BLM and USFS Geocommunicator and Legacy Rehost 2000 System (LR2000) database (BLM 2009a). Additional information pertaining to mineral

resources was obtained from other federal and state sources, including the USGS, U.S. Bureau of Mines, BLM, Utah Geological Survey, and Utah Department of Natural Resources (UDNR) Division of Oil, Gas, and Mining, Wyoming Oil and Gas Conservation Commission, Wyoming Landscape Conservation Initiative, and State of Colorado. The mineral resources identified for the Project are shown in MV-4.

3.2.2.4.2 Impact Assessment and Mitigation Planning

Geologic Hazards

After compiling the resource inventory for geologic hazards, the methodology for assessing their potential impacts on the Project included (1) identifying the types of potential effects on the Project from geologic hazards, (2) developing criteria for assessing the level of potential impacts on the Project from geologic hazards, (3) classifying the level (high, moderate, low), (4) assessing initial impacts on the Project, (5) identifying the appropriate selective mitigation measures for minimizing potential adverse effects, (6) determining specific areas where selective mitigation should be applied, and (7) disclosing potential residual impacts on the Project from geologic hazards.

Types of Potential Effects Resulting from Geologic Hazards

The Project would not be anticipated to affect faults, cause earthquakes, or cause liquefaction. However, the Project could potentially contribute to destabilization of slopes or the reactivation of landslide deposits. Specific locations where geologic hazards could be affected are identified in Section 3.2.2.5. Geologic hazards could directly or indirectly affect the construction, operation, and maintenance of the Project. Potential direct effects include direct loss of equipment or injury to personnel as a result of seismic activity or landslides, especially in steep terrain. Potential indirect effects on the operation of the Project could include indirect loss of transmission service as a result of seismic activity or landslides.

The construction of the Project could directly or indirectly affect areas with high and moderate landslide susceptibility. A potential direct effect includes the removal of soils and sediments in areas with moderate to high landslide susceptibility. A potential indirect effect is the removal of vegetation, which could affect slope stability.

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of potential impacts resulting from a geological hazard on the Project (Table 3-24). Quaternary faults were assigned a high level of impact because they are considered active and capable of generating strong earthquakes in the near future. Inactive (pre-Quaternary) faults were assigned a moderate level of impact because these faults could be reactivated in the distant future. Level of impacts related to the potential for landsliding was based on an area's landslide susceptibility, previously mapped landslides, and steep slopes. Areas for flood susceptibility were assigned values of high, moderate, or low based on an area's proximity to streams and rivers as well as on topography.

TABLE 3-24
CRITERIA FOR ASSESSING LEVEL OF IMPACTS FROM GEOLOGIC HAZARDS

Level of Impacts	Description
High	▪ Areas with steep terrain (30 percent slope or greater) or high landslide susceptibility ▪ Areas where Quaternary faults (most recent and considered active) are present ▪ Areas within the highest percentile (85 to 100 percent rank) for flooding[1]
Moderate	▪ Areas with moderately steep terrain (15 to 30 percent slope) or moderate landslide susceptibility ▪ Areas with pre-Quaternary faults (inactive) present ▪ Areas within a moderate percentile (70 to 84 percent rank) for flooding[1]

TABLE 3-24 CRITERIA FOR ASSESSING LEVEL OF IMPACTS FROM GEOLOGIC HAZARDS	
Level of Impacts	**Description**
Low	▪ Areas without steep terrain (0 to 15 percent slope) having low landslide susceptibility ▪ Areas within the lowest percentile (0 to 69 percent rank) for flooding[1]
NOTE: [1]Based on the Hazard Index of the National Pipeline Mapping System	

Effects Analysis

Assessment of Initial Impacts

The level of potential impacts from geologic hazards that could result from implementation of the Project is used for assessing initial impacts of geologic hazards. Based on the level of potential effects on geologic hazards, initial impacts were assigned using the criteria presented in Table 3-24 and are presented in Table 3-25.

Mitigation Planning and Effectiveness

In addition to the design features of the Proposed Action included as part of the Project description (refer to Table 2-8), selective mitigation measures would be applied to areas where the Project crosses geologic hazards, where feasible, to reduce impacts on the Project from these hazards. Selective mitigation measures applied to reduce impacts from geologic hazards are summarized in Table 3-25 and described in this section.

- **Selective Mitigation Measure 3 (minimize slope cut and fill).** New access roads and overland access routes in areas with high and moderate landslide susceptibility would be aligned to follow the landform contours where practicable, to reduce destabilization of steep slopes.
- **Selective Mitigation Measure 7 (span/avoid sensitive features).** Tower structures would be located so as to span areas with high and moderate susceptibility to flooding for distances where this is practicable to limit the potential for flooding to impact the tower structures.

Residual Impacts

Table 3-25 summarizes the initial impacts (based on the level of potential effects) on geologic hazards, the selective mitigation measures applied to mitigate potentially adverse effects by geologic hazards, and residual impacts.

TABLE 3-25 SUMMARY OF INITIAL AND RESIDUAL IMPACTS FROM GEOLOGIC HAZARDS			
Geological Hazard	**Initial Impact**	**Selective Mitigation Measures Applied**	**Residual Impact**
Quaternary faults	Moderate	None	Moderate
High landslide susceptibility	High	3	Moderate
High flooding susceptibility	High	7	Low
Pre-Quaternary faults	Low	None	Low
Moderate landslide susceptibility	Moderate	3	Low
Moderate flooding susceptibility	Moderate	7	Low
NOTE: Residual impacts reflect the implementation of design features and selective mitigation measures.			

Soil Resources

After compiling the resource inventory for soil resources, the methodology for assessing potential impacts on these resources included (1) identifying the types of potential effects on soil resources from implementation of the Project, (2) developing criteria for assessing the level of potential impacts on soil resources resulting from the Project, (3) classifying the level of potential effects (high, moderate, low) based on the susceptibility to accelerated erosion by water or wind and the conversion of designated Prime or Unique Farmland soils to nonagricultural uses, (4) assessing initial impacts on soil resources by applying the Project access model (Table 2-10) as well as disclosing the amount of estimated disturbance along the right-of-way from temporary and permanent disturbance (Table 2-1), (5) identifying the appropriate selective mitigation measures for minimizing potential adverse effects, (6) determining specific areas where selective mitigation should be applied, and (7) disclosing potential residual impacts on soil resources.

Types of Potential Environmental Effects

The construction, operation, and maintenance of the Project would result in both direct and indirect effects on soil resources. Direct effects associated with construction activities could include the following:

- Accelerated soil erosion in areas where construction-related activities have disturbed or altered the land surface by exposing soils (temporary)
- Accelerated soil erosion in areas where construction-related activities have altered the contours of the land surface (temporary)
- Loss of designated Prime or Unique Farmland soils (i.e., conversion to nonagricultural uses) (permanent)
- Compaction of soil resources by construction vehicles, equipment, and activities at tower sites and along new access routes (permanent and temporary)
- Loss of soil resources in previously undisturbed areas converted to permanent access roads (temporary and permanent)

Potential direct effects associated with the operation of the facilities, presence of the transmission line, or maintenance activities associated with the Project include soil compaction by maintenance vehicles along permanent access roads.

Indirect effects associated with the construction, operation, and maintenance of the Project could include the following:

- Construction of permanent access roads that could be used by the general public to access currently inaccessible areas, potentially resulting in accelerated erosion by water or wind (permanent)
- Degradation of the land surface and loss of soil productivity resulting from accelerated soil erosion (temporary to permanent)

Potential impacts on erodible soils on steep slopes were analyzed relative to gradual slopes and flat land. New or expanded access roads on steep slopes would have greater potential impacts on erodible soils than existing access roads on gradual or flat slopes. The potential for greater impacts would result in more extensive implementation of mitigation measures in these areas.

Compaction and water ponding are soil disturbances that result in the loss of soil structure, possibly leading to a decrease in water infiltration rates, soil loss, or environmental degradation (e.g., the establishment of noxious weeds in disturbed areas). Overland movement of construction equipment during moist conditions is the primary cause of soil compaction or water ponding. However, compaction

also could occur where new access roads are constructed and at tower sites. Compaction of soils would be mitigated where access roads are temporary but could remain on permanent access roads and at tower sites. Furthermore, reducing vegetation cover (i.e., vegetation clearing) in the right-of-way could increase soil temperatures resulting in reduced soil productivity and could increase the potential for erosion.

Rutting could occur where soils are saturated, making the soil strength insufficient to support the weight of vehicular traffic on existing or newly constructed roads and during overland travel. The topsoil and subsoil could mix, reducing productivity and affecting the surface hydrology of an area. Rutting would be mitigated by limiting movement of construction equipment over moist soils and limiting vegetation clearing. Retaining vegetation less than 25 feet in height in portions of the right-of-way would reduce the level of this impact. Overall, soil compaction, water ponding, and rutting would be mitigated by the design features of the Proposed Action for environmental purposes and selective mitigation measures to be included as requirements in the POD, including soil tillage, limited movement of construction equipment over moist soils, limited vegetation clearing, and use of agency-approved herbicides under the direction of agency-issued Pesticide Use Permits.

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of a potential effect on soil resources associated with implementation of the Project (Table 3-26). These criteria were based on susceptibility of soils to water and wind erosion relevant to slope percentage and potential impact on designated Prime or Unique Farmland soils.

Soil susceptibilities to water and wind erosion were assessed based on standards from the NRCS. The susceptibility of a soil to water erosion is based on its assigned K_w value, a numerical factor representing the relative water erodibility of the whole soil. Soils assigned a K_w value of 0.40 or higher have a high susceptibility to water erosion; whereas soils assigned a K_w value between 0.20 and 0.40 have a moderate susceptibility to water erosion. Soils assigned a K_w value below 0.20 have a low susceptibility to water erosion.

The susceptibility of a soil to wind erosion is based on its assignment to a Wind Erodibility Group (WEG). Soils assigned to WEG 1 or 2 are highly susceptible to wind erosion; soils assigned to WEG 3, 4, or 4L have a moderate susceptibility to wind erosion; soils assigned to WEG 5, 6, or 7 have a low susceptibility to wind erosion; and soils assigned to WEG 8 are not susceptible to wind erosion.

TABLE 3-26
CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON SOIL RESOURCES

Level of Impacts	Description
High	▪ Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes greater than 15 percent (i.e., access levels 2, 5, and 6) [1] ▪ Construction of new access roads across designated Prime or Unique Farmland soils
Moderate	▪ Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes between 0 and 15 percent (i.e., access levels 3 and 4) [1] ▪ Disturbance of land surface where soils exhibit moderate susceptibility to erosion by water or wind on slopes greater than 15 percent ▪ Improvement of existing roads in areas where soils exhibit moderate susceptibility to erosion by water or wind

TABLE 3-26 CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON SOIL RESOURCES	
Level of Impacts	**Description**
Low	▪ Disturbance of land surface where soils exhibit high susceptibility to erosion by water or wind on slopes between 0 and 8 percent and existing access is present (i.e., access level 1) [1] ▪ Disturbance of land surface where soils exhibit moderate susceptibility to erosion by water or wind on slopes less than 15 percent (i.e., access levels 1, 3, and 4) ▪ Disturbance of land surface where soils exhibit low susceptibility to erosion by water or wind for all slope gradients (i.e., all access levels) ▪ Use of existing roads
NOTE: [1]Access levels are defined in Table 2-10.	

Effects Analysis

Assessment of Initial Impacts

The level of a potential effect on soil resources that could result from implementation of the Project is used for assessing initial impacts. The initial impacts were assigned using the criteria presented in Table 3-26.

Mitigation Planning and Effectiveness

In addition to the design features of the Proposed Action included as part of the Project (Table 2-8), selective mitigation measures would be applied to areas of potential high and moderate (initial) impacts on soils and designated Prime or Unique Farmland soils, where feasible, to reduce impacts. Selective mitigation measures applied to reduce impacts on soil resources are summarized in and described in this section.

- **Selective Mitigation Measure 1 (disturbance of sensitive soils and vegetation)**. Existing access roads or trails would not be widened or otherwise upgraded for construction and maintenance in areas where soils are moderately to highly susceptible to accelerated erosion and where designated Prime or Unique Farmland soils would be crossed by the Project. This measure would limit new disturbance associated with construction and maintenance of the Project in previously undisturbed areas, which would reduce exposure of soils highly or moderately susceptible to wind or water erosion.
- **Selective Mitigation Measure 2 (sensitive resources avoidance)**. There would be no blading of new access roads in areas with sensitive soils or in areas where Project-related activities could affect designated Prime or Unique Farmland soils.
- **Selective Mitigation Measure 3 (minimize slope cut and fill)**. New access roads and overland access routes in areas where soils could be moderately or highly susceptible to soil erosion (i.e., in moderately rolling or steep terrain) would be aligned to follow the landform contours, where practicable, to reduce associated soil erosion by maintaining the natural land contours, thereby limiting the rate of water runoff. This mitigation measure would only be applied in areas with slopes greater than 3 percent.
- **Selective Mitigation Measure 7 (span and/or avoid sensitive features).** Tower structures would be located so as to span designated Prime or Unique Farmland soils to minimize irreversible conversion of agricultural lands to nonagricultural uses by limiting the number of tower sites located on designated Prime or Unique Farmland soils.
- **Selective Mitigation Measure 13 (overland access)**. Where no grading would be needed to access work areas, overland access would be used to the extent possible in areas where soils

would be moderately to highly susceptible to accelerated erosion and in designated Prime or Unique Farmland soils, which would avoid or minimize the removal of surface soil and vegetation and limit the exposure of soils susceptible to wind and water erosion.

Residual Impacts

Table 3-27 summarizes the initial impacts based on the level of potential effects on soil resources, the selective mitigation measures applied to mitigate potentially adverse impacts on soil resources, and residual impacts.

TABLE 3-27
SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON SOIL RESOURCES

Soil Resource	Initial Impact	Selective Mitigation Measures Applied	Residual Impact
Soils with high susceptibility to water and wind erosion (based on range of slopes identified for access levels 2, 5, or 6)	High	1, 3, 13	Moderate
Soils designated Prime or Unique Farmland	High	1, 2, 7, 13	Moderate
Soils with high susceptibility to water and wind erosion (based on range of slopes identified for access levels 3 and 4)	Moderate	1, 3, 13	Low
Soils with moderate susceptibility to water and wind erosion (based on range of slopes identified for access levels 2, 5, or 6)	Moderate	1, 3, 13	Low
Soils with high susceptibility to water or wind erosion (based on range of slopes identified for access level 1)	Low	None	Low
Soils with moderate susceptibility to water or wind erosion (based on range of slopes identified for access levels 1, 3, or 4)	Low	None	Low
Soils with low susceptibility to water or wind erosion (based on range of slopes identified for all access levels)	Low	None	Low
Soils not designated Prime or Unique Farmland	Low	None	Low

Mineral Resources

After compiling the resource inventory for mineral resources, the methodology for assessing potential impacts on these resources included (1) identifying the types of potential effects on the mineral resources that could result from the construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) developing criteria for assessing the level of a potential effect on a mineral resource, (3) identifying the level of potential effects on the mineral resources, (4) assessing the initial impacts on mineral resources, and (5) identifying the appropriate selective mitigation measures for minimizing potential adverse effects on mineral resources, (6) determining specific areas where selective mitigation measures should be applied, and (7) disclosing potential residual impacts on the mineral resources.

Types of Potential Environmental Effects

Locatable, leasable, and salable mineral resources can be exposed at the surface, lie just below the surface, or be located several hundred feet below the surface. Oil and gas leases exist in a number of counties that could be crossed by the Project. Extensive petroleum exploration, recovery, and transportation infrastructure exists or could exist in the future. Active mines and mining operations exist in a number of counties that could be crossed by the Project. Avoidance of land use conflicts (e.g., mining

operations and oil and gas production areas) where possible, was a criterion in the Applicant's engineering study to identify locations where transmission lines could be sited and constructed. Where mining operations or mineral resources are not able to be avoided, construction and maintenance of the Project could have the following direct effects on mineral resources:

- Loss of mineral resources caused by construction activities
- Limited development and extraction of mineral resources resulting from the presence of permanent facilities (permanent)
- Prevention of future development and extraction of mineral resources resulting from the presence of permanent facilities (permanent)

There would be no indirect effects on mineral resources as a result of implementation of the Project.

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of a potential effect on a mineral resource associated with implementation of the Project (Table 3-28). These criteria were based on the type of mineral resource and any activities associated with the mineral resource.

TABLE 3-28
CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON MINERAL RESOURCES

Level of Impacts	Description
High	▪ Areas with active mines or mining claims ▪ Areas with producing oil and gas or geothermal wells
Moderate	▪ Permitted mines ▪ Coal leases ▪ Oil and gas leases ▪ Geothermal leases
Low	▪ Potential mineral areas[1]

NOTE: [1]Areas where a mineral resource potential is identified but is not currently being developed

Effects Analysis

Assessment of Initial Impacts

The level of potential effects on mineral resources that could result from implementation of the Project is the basis for assessing initial impacts on mineral resources. The initial impacts were assigned using the criteria presented in Table 3-28 and are presented in Table 3-29. For mineral resources, there are large areas where different types of leases (e.g., coal or oil and gas) overlap. In such cases, the miles are not duplicated in the initial impacts.

Mitigation Planning and Effectiveness

In addition to the design features of the Proposed Action included as part of the Project description in Chapter 2 (Table 2-8), selective mitigation measures were developed to avoid or minimize potential high and moderate impacts on mineral resources, where feasible. Selective mitigation measures applied to reduce impacts on soil resources are summarized in Table 3-29 and described in this section.

- **Selective Mitigation Measure 2 (sensitive resource avoidance).** There would be no blading of new access roads in areas with active mines, producing wells, permitted mines, coal and other leases, oil and gas leases, geothermal leases, and active mines to limit potential conflicts with the development of these resources.

- **Selective Mitigation Measure 7 (span/avoid sensitive features).** Tower structures would be located so as to span active mines and producing oil, gas, or geothermal wells to limit conflicts with access to, or expansion of, these sites, where practicable.

Residual Impacts

Table 3-29 summarizes the initial impacts based on the level of a potential effect on mineral resources, the selective mitigation measures applied to mitigate potentially high and moderate adverse effects on those mineral resources, and residual impacts.

TABLE 3-29
SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON MINERAL RESOURCES

Mineral Resource	Initial Impact	Selective Mitigation Measures Applied	Residual Impact
Active mines and producing oil and gas, or geothermal wells	High	2, 7	Low
Permitted mines	Moderate	2	Low
Coal leases	Moderate	2	Low
Oil and gas leases	Moderate	2	Low
Geothermal leases	Moderate	2	Low
Active mining claims	Moderate	2	Low
Potential mines	Low	None	Low

3.2.2.5 Results

The summaries of baseline resource inventories and results of the effects analysis for geologic hazards, mineral resources, and soils are presented in Tables 3-30, 3-31, and 3-32 and are described in this section. The description of residual impacts should be reviewed in conjunction with the resource inventory maps in Volume II. Table S-1a presents a comparison of results of the effects analysis for the alternative routes organized by resource.

3.2.2.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.2.5.2 Impacts Common to All Action Alternatives

Impacts associated with geologic hazards, mineral resources, and soil resources are closely tied to the physical presence of the Project and would vary by alternative route. Minor variations are frequent throughout the comparisons of alternative routes for earth resources, meaning small changes in the amount of impacts (mileage) occur between the alternative routes.

3.2.2.5.3 345-kilovolt Ancillary Transmission Line Components

Geologic Hazards

Quaternary faults are the only geologic hazards crossed by the 345kV transmission line components between the Mona and Clover substations. Residual impacts from geologic hazards along each of these links would be moderate.

Soil Resources

Soils that are moderately susceptible to water and/or wind erosion and small areas of designated Prime or Unique Farmland soils are crossed by the 345kV transmission components between the Mona and Clover

substations. Residual impacts on soil resources along each of these links would be moderate in areas where Prime or Unique Farmland soils are crossed and low where soils that are moderately susceptible to water and/or wind erosion are crossed.

Mineral Resources

No active mines, producing wells, or leases of any type are crossed by the 345kV transmission line components between the Mona and Clover substations. Sections of the 345kV components cross an area with mineral potential. Residual impacts on mineral resources along each of these links would be low associated with a mineral potential area crossed by the 345kV transmission line components between the Mona and Clover substations.

3.2.2.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Geologic Hazards

Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming cross 6.9 miles of areas with potential mine subsidence, 7.2 miles of areas with moderate flood susceptibility, and 26.1 miles of areas with moderate landslide potential (Table 3-30 and MV-2).

Soil Resources

Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming cross no lands designated as Prime or Unique Farmland soils; 0.2 mile of soils highly susceptible to water erosion and 19.9 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 7.8 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-4).

Mineral Resources

Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming cross 9.5 miles of active mines or producing wells; 43.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 85.2 miles of potential mineral resources (Table 3-30 and MV-3).

Environmental Consequences (Wyoming)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, the alternative route and route variations cross 138.1 miles of areas that would have low impacts from geologic hazards (Table 3-30 and MV-2).

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, there would be 0.2 mile of moderate impacts on soils highly susceptible to water erosion along Link W30 near Rawlins, Wyoming, due to potential acceleration of

erosion rates, and 137.9 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-B would also include an estimated 2,342 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 229 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 350 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, there would be 80.8 miles of low impacts on potential mineral resources (Table 3-30 and MV-4).

<u>Affected Environment (Colorado)</u>

Geologic Hazards

Alternative WYCO-B in Colorado crosses 1.4 miles of areas with moderate flood susceptibility and 2.7 miles of areas with high landslide susceptibility and 52.5 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

In Colorado, Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 cross the same geologic hazards as Alternative WYCO-B with the exception of the extent of areas with moderate landslide susceptibility (Table 3-30). Route Variation WYCO-B-1 crosses 0.4 mile more areas with moderate landslide susceptibility; whereas, Route Variation WYCO-B-2 crosses 2.2 fewer miles and WYCO-B-3 crosses 1.1 fewer miles.

Soil Resources

Alternative WYCO-B in Colorado crosses 15.7 miles of lands designated as Prime or Unique Farmland soils; 8.9 miles of soils moderately susceptible to water erosion; and 1.4 miles of soils highly susceptible to wind erosion and 8.7 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

In Colorado, Route Variation WYCO-B-1 in Colorado crosses 13.9 miles of lands designated as Prime or Unique Farmland soils; 8.9 miles of soils moderately susceptible to water erosion; and 1.4 miles of soils highly susceptible to wind erosion and 8.7 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

Route Variation WYCO-B-1 in Colorado crosses 1.8 fewer miles of lands designated as Prime or Unique Farmland soils. Route Variation WYCO-B-2 crosses 1.8 fewer miles of lands designated as Prime or Unique Farmland soils, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.7 fewer mile of soils moderately susceptible to wind erosion. Route Variation WYCO-B-3 crosses 0.3 fewer mile of lands designated as Prime or Unique Farmland soils, 0.1 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.1 fewer mile of soils moderately susceptible to wind erosion.

Mineral Resources

Alternative WYCO-B in Colorado crosses 26.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases, and 40.0 miles of potential mineral resources (Table 3-30 and MV-4).

In Colorado, Route Variation WYCO-B-1 crosses 1.8 miles more of permitted mines, coal leases, oil and gas leases, or geothermal leases and 1.4 fewer miles of potential mineral resources than Alternative

WYCO-B. Route Variation WYCO-B-2 crosses 0.4 fewer mile of permitted mines, coal leases, oil and gas leases, or geothermal leases and 0.4 mile more of potential mineral resources than Alternative WYCO-B. Route Variation WYCO-B-3 crosses 0.2 mile more of permitted mines, coal leases, oil and gas leases, or geothermal leases and 0.2 fewer mile of potential mineral resources.

Environmental Consequences (Colorado)

Geologic Hazards

Alternative WYCO-B

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-B, the alternative route crosses 66.4 miles of areas that would pose only low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Route Variations WYCO-B-2 and WYCO-B-3, impacts on the Project from geologic hazards would be similar to Alternative WYCO-B and Route Variation WYCO-B-1 would have 0.4 mile more of low impacts than Alternative WYCO-B.

Soil Resources

Alternative WYCO-B

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-B in Colorado, there would be 1.4 miles of moderate impacts on soils highly susceptible to wind erosion along Link C175 near Massadona, Colorado, due to anticipated acceleration of erosion rates and 65.0 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-B would also include an estimated 2,342 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 229 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 350 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, impacts along Route Variation WYCO-B-1 would be the same as those along Alternative WYCO-B. Route Variations WYCO-B-2 and WYCO-B-3 would include 0.1 fewer mile of moderate impacts than Alternative WYCO-B.

Mineral Resources

Alternative WYCO-B

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-B, there would be 47.5 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, there would be 0.4 mile more of low impacts on mineral resources along WYCO-B-1 than WYCO-B, 0.3 mile more along WYCO-B-2, and 0.1 mile more along WYCO-B-3.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Geologic Hazards

Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming cross 6.9 miles of areas of potential mine subsidence, 8.0 miles of areas with moderate flood susceptibility, and 21.4 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

Soil Resources

Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming cross no lands designated as Prime or Unique Farmland soils; 0.2 mile of soils highly susceptible to water erosion and 17.9 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and cross 6.3 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

Mineral Resources

Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming cross 9.3 miles of active mines or producing wells; 48.5 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 86.2 miles of potential mineral resources (Table 3-30 and MV-4).

Environmental Consequences (Wyoming)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3; the alternative routes cross 144.0 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3; there would be 0.2 mile of moderate impacts on soils highly susceptible to water erosion along Link W30 near Rawlins, Wyoming, due to an anticipated accelerated rate of erosion, and 143.8 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-C would also include an estimated 2,410 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 231 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 336 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3; there would be 89.6 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Affected Environment (Colorado)

Geologic Hazards

Alternative WYCO-C in Colorado crosses 1.4 miles of areas with moderate flood susceptibility and 2.7 miles of areas with high landslide susceptibility and 52.5 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

In Colorado, Route Variation WYCO-C-1 crosses 0.4 mile more of areas with moderate landslide susceptibility than Alternative WYCO-C. Route Variation WYCO-C-2 crosses 2.2 fewer miles of areas with moderate landslide susceptibility than Alternative WYCO-C. Route Variation WYCO-C-3 crosses 1.1 fewer miles of areas with moderate landslide susceptibility than Alternative WYCO-C.

Soil Resources

Alternative WYCO-C in Colorado crosses 15.7 miles of lands designated as Prime or Unique Farmland soils, 8.9 miles of soils moderately susceptible to water erosion, and 1.4 miles of soils highly susceptible to wind erosion and 8.7 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

In Colorado, Route Variation WYCO-C-1 crosses 1.8 fewer miles of lands designated as Prime or Unique Farmland soils than Alternative WYCO-C. Route Variation WYCO-C-2 crosses 0.4 fewer mile of lands designated as Prime or Unique Farmland soils, 0.5 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.7 fewer mile of soils moderately susceptible to wind erosion than Alternative WYCO-C. Route Variation WYCO-C-3 crosses 0.3 fewer mile of lands designated as Prime or Unique Farmland soils, 0.1 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.1 fewer mile of soils moderately susceptible to wind erosion than Alternative WYCO-C.

Mineral Resources

Alternative WYCO-C in Colorado crosses 26.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 40.0 miles of potential mineral resources (Table 3-30 and MV-4).

In Colorado, Route Variation WYCO-C-1 crosses 1.8 miles more of permitted mines, coal leases, oil and gas leases, or geothermal leases and 1.4 fewer miles of potential mineral resources than Alternative WYCO-C. Route Variation WYCO-C-2 crosses 0.4 fewer mile of permitted mines, coal leases, oil and gas leases, or geothermal leases and 0.4 mile more of potential mineral resources than Alternative WYCO-C. Route Variation WYCO-C-3 crosses 0.2 mile more of permitted mines, coal leases, oil and gas leases, or geothermal leases and 0.2 fewer mile of potential mineral resources than Alternative WYCO-C.

Environmental Consequences (Colorado)

Geologic Hazards

Alternative WYCO-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-C, the alternative route crosses 66.4 miles

of areas that could pose low impacts on the Project from geologic hazards (and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measure 3 (Table 2-13) along Route Variations WYCO-C-2 and WYCO-C-3, the route variations cross areas that could pose low impacts on the Project from geologic hazards. Route Variation WYCO-C-1 crosses 0.4 mile more of areas that could pose low impacts on the Project from geologic hazards than Alternative WYCO-C. Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Alternative WYCO-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-C, there would be 1.4 miles of moderate impacts on soils highly susceptible to wind erosion along Link C175 near Massadona, Colorado, due to anticipated acceleration of erosion rates and 65.0 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-C would also include an estimated 2,410 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 231 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 336 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3; there would be the same impacts as Alternative WYCO-C along Route Variation WYCO-C-1, 0.1 fewer mile of moderate impacts along Route Variation WYCO-C-2 than Alternative WYCO-C, and 0.1 fewer mile of moderate impacts along Route Variation WYCO-C-3 than Alternative WYCO-C.

Mineral Resources

Alternative WYCO-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-C, there would be 47.5 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3; there would be similar impacts on mineral resources as along Alternative WYCO-C. Along Route Variation WYCO-C-1, there would be 0.4 mile more of low impacts on mineral resources than Alternative WYCO-C. Along Route Variation WYCO-C-2, there would be 0.3 mile more of low impacts on mineral resources than Alternative WYCO-C. Along Route Variation WYCO-C-3, there would be 0.1 mile more of low impacts on mineral resources than Alternative WYCO-C.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Geologic Hazards

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming cross 6.3 miles of areas with potential mine subsidence, 3.2 miles of areas with moderate flood susceptibility, and 25.0 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

Soil Resources

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming do not cross any lands designated as Prime or Unique Farmland soils; cross 0.8 mile of soils highly susceptible to water erosion, 14.5 miles of soils moderately susceptible to water erosion; and do not cross any soils highly susceptible to wind erosion and cross 3.3 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

Mineral Resources

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming cross 6.8 miles of active mines or producing wells; 42.3 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 85.9 miles of potential mineral resources (Table 3-30 and MV-4).

Environmental Consequences (Wyoming)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-D and Route Variation WYCO D-1, the alternative routes cross 135.0 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-D and Route Variation WYCO-D-1, there would be 0.8 mile of moderate impacts on soils highly susceptible to water erosion along Links W16 and W30 near Rawlins, Wyoming, due to anticipated acceleration of erosion rates, and 134.2 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-D would also include an estimated 2,862 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 243 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 296 acres of vegetation clearing in the right-of-way for Wyoming and Colorado. Alternative WYCO-D would have a greater impact on soils (farmlands and soils susceptible to water erosion) than any other alternative route in the WYCO group.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-D and Route Variation WYCO-D-1, there would be 71.1 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Affected Environment (Colorado)

Geologic Hazards

Alternative WYCO-D in Colorado crosses 6.6 miles of areas with moderate flood susceptibility and 8.6 miles of areas with high landslide susceptibility and 95.4 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

In Colorado, Route Variation WYCO-D-1 crosses the same areas of geologic hazards as Alternative WYCO-D with the exception of 1.1 fewer miles of areas with moderate flood susceptibility.

Soil Resources

Alternative WYCO-D in Colorado crosses 26.2 miles of lands designated as Prime or Unique Farmland soils, no soils highly susceptible to water erosion and 10.8 miles of soils moderately susceptible to water erosion, and 1.1 miles of soils highly susceptible to wind erosion and 13.5 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3). Alternative WYCO-D would also include an estimated 2,862 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 243 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 296 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

In Colorado, Route Variation WYCO-D-1 crosses the same soils resources as Alternative WYCO-D with the exception of 0.3 fewer mile of lands designated as Prime or Unique Farmland soils, 0.1 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.1 fewer mile of soils moderately susceptible to wind erosion.

Mineral Resources

Alternative WYCO-D in Colorado crosses 0.2 mile of active mines or producing wells; 41.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 73.4 miles of potential mineral resources (Table 3-30 and MV-4).

In Colorado, Route Variation WYCO-D-1 crosses the same areas of mineral resources as Alternative WYCO-D with the exception of 0.2 fewer mile of permitted mines, coal leases, oil and gas leases, or geothermal leases.

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-D and Route Variation WYCO-D-1, the alternative route crosses 115.0 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Alternative WYCO-D

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-D, there would be 1.1 miles of moderate impacts on soils highly susceptible to wind erosion along Link C106 near Maybell, Colorado, and Link C175 near Massadona, Colorado, due to anticipated acceleration of erosion rates, and 113.9

miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-D would also include an estimated 2,862 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 243 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 296 acres of vegetation clearing in the right-of-way for Wyoming and Colorado. Alternative WYCO-D would have greater impact on soils (farmlands and soils susceptible to water erosion) than any other alternative route in the WYCO group.

Alternative WYCO-D Route Variation (WYCO-D-1)

Following implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variation WYCO-D-1, there would be 0.1 fewer mile of moderate impacts on soil resources than along Alternative WYCO-D.

Mineral Resources

Alternative WYCO-D

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-D, there would be 88.3 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Alternative WYCO-D Route Variation (WYCO-D-1)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variation WYCO-D-1, there would be 0.1 mile more of low impacts on mineral resources than along Alternative WYCO-D.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Geologic Hazards

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming, cross 6.9 miles of areas with potential mine subsidence, 7.2 miles of areas with moderate flood susceptibility, and 33.9 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

Soil Resources

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming do not cross any lands designated as Prime or Unique Farmland soils or soils highly susceptible to wind erosion; however, the alternative and route variations cross 0.2 mile of soils highly susceptible to water erosion, 18.5 miles of soils moderately susceptible to water erosion, and 5.2 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

Mineral Resources

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming cross 9.6 miles of active mines or producing wells; 33.3 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 109.6 miles of potential mineral resources (Table 3-30 and MV-4).

Environmental Consequences (Wyoming)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3; the alternative routes cross 152.5 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3; there would be 0.2 mile of moderate impacts on soils highly susceptible to water erosion along Link W30 near Rawlins, Wyoming, and 152.3 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-F would also include an estimated 2,506 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 234 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 347 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3; there would be 82.8 miles of low impacts on mineral resources in Wyoming (Table 3-30 and MV-4).

Affected Environment (Colorado)

Geologic Hazards

Alternative WYCO-F in Colorado crosses 1.4 miles of areas with moderate flood susceptibility and 2.7 miles of areas with high landslide susceptibility and 52.5 miles of areas with moderate landslide susceptibility (Table 3-30 and MV-2).

In Colorado, Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 cross similar geologic hazards as Alternative WYCO-F with the exception of 0.4 mile more of moderate landslide susceptibility along Route Variation WYCO-F-1, 2.2 fewer miles of moderate landslide susceptibility along Route Variation WYCO-F-2, and 1.1 fewer miles of moderate landslide susceptibility along Route Variation WYCO-F-3.

Soil Resources

Alternative WYCO-F in Colorado crosses 15.7 miles of lands designated as Prime or Unique Farmland soils, 8.9 miles of soils moderately susceptible to water erosion, and 1.4 miles of soils highly susceptible to wind erosion and 8.7 miles of soils moderately susceptible to wind erosion (Table 3-30 and MV-3).

In Colorado Route Variation WYCO-F-1 crosses similar soil resources as Alternative WYCO-F with the exception of 1.8 fewer miles of lands designated as Prime or Unique Farmland soils. Route Variation WYCO-F-2 crosses 0.4 fewer mile of lands designated as Prime or Unique Farmland soils, 0.5 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly susceptible to wind erosion, and 0.7 fewer mile of soils moderately susceptible to wind erosion than Alternative WYCO-F. Route Variation WYCO-F-3 crosses 0.3 fewer mile of lands designated as Prime or Unique Farmland soils, 0.1 fewer mile of soils moderately susceptible to water erosion, 0.1 fewer mile of soils highly

susceptible to wind erosion, and 0.1 fewer mile of soils moderately susceptible to wind erosion than Alternative WYCO-F.

Mineral Resources

Alternative WYCO-F in Colorado crosses 26.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 40.0 miles of potential mineral resources (Table 3-30 and MV-4).

In Colorado, Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 cross similar mineral resources as Alternative WYCO-F with the exception of 1.8 miles more of permitted mines, coal leases, oil and gas leases, or geothermal leases along Route Variation WYCO-F-1, 0.4 fewer mile of these same resources along Route Variation WYCO-F-2, and 0.2 mile more of these mineral resources along Route Variation WYCO-F-3.

<u>Environmental Consequences (Colorado)</u>

Geologic Hazards

Alternative WYCO-F

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative WYCO-F, the alternative route crosses 66.4 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-30 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measure 3 (Table 2-13) along Route Variations WYCO-F-2 and WYCO-F-3, impacts on the project from geologic hazards would be the same as along Alternative WYCO-F. Route Variation WYCO-F-1 crosses 0.4 mile more of areas that could pose low impacts on the Project from geologic hazards than Alternative WYCO-F. Construction of the Project would not be anticipated to result in moderate or high impacts on geologic hazards.

Soil Resources

Alternative WYCO-F

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative WYCO-F, there would be 1.4 miles of moderate impacts on soils highly susceptible to wind erosion along Link C175 near Massadona, Colorado, due to anticipated acceleration of erosion rates, and 65.0 miles of low impacts on soil resources (Table 3-30 and MV-3). Alternative WYCO-F would also include an estimated 2,506 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 234 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 347 acres of vegetation clearing in the right-of-way for Wyoming and Colorado.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3; impacts on soils resources would similar to those along Alternative WYCO-F. Route Variation WYCO-F-1 crosses the same moderate impacts, WYCO-F-2 crosses 0.1 fewer mile moderate

impacts, and WYCO-F-3 crosses 0.1 fewer mile moderate impacts on soil resources than Alternative WYCO-F.

Mineral Resources

Alternative WYCO-F

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative WYCO-F, there would be 47.5 miles of low impacts on mineral resources (Table 3-30 and MV-4).

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3; impacts on mineral resources would be similar to those along Alternative WYCO-F. Route Variation WYCO-F-1 crosses 0.4 mile more of low impacts, Route Variation WYCO-F-2 would cross 0.3 mile more of low impacts, and Route Variation WYCO-F-3 crosses 0.1 mile more of low impacts on mineral resources than Alternative WYCO-F.

TABLE 3-30
ALTERNATIVE ROUTE COMPARISON FOR EARTH RESOURCES INVENTORY DATA AND RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Geologic Hazards (miles crossed)						Mineral Resources (miles)			Soil Resources (miles crossed)								Miles of Residual Impacts (miles crossed)											
		Mine Subsidence (miles)	Flooding		Landslide Susceptibility						Farmland		Water Erosion Susceptibility			Wind Erosion Susceptibility			Geologic Hazards				Mineral Resources				Soil Resources			
			Low	Moderate	Low or None	Moderate	High	High	Moderate	Low	High	Low	High	Moderate	Low	High	Moderate	Low	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High
Alternative WYCO-B and Route Variations																														
WYCO-B (Applicant Preferred Alternative)	204.5	6.9	195.9	8.6	123.2	78.6	2.7	9.5	69.8	125.2	15.7	188.8	0.2	28.8	175.5	1.4	16.5	186.6	–	204.5	–	–	76.2	128.3	–	–	–	202.9	1.6	–
Wyoming	*138.1*	*6.9*	*130.9*	*7.2*	*112.0*	*26.1*	–	*9.5*	*43.4*	*85.2*	–	*138.1*	*0.2*	*19.9*	*118.0*	–	*7.8*	*130.3*	–	*138.1*	–	–	*57.3*	*80.8*	–	–	–	*137.9*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*11.2*	*52.5*	*2.7*	–	*26.4*	*40.0*	*15.7*	*50.7*	–	*8.9*	*57.5*	*1.4*	*8.7*	*56.3*	–	*66.4*	–	–	*18.9*	*47.5*	–	–	–	*65.0*	*1.4*	–
WYCO-B-1	204.9	6.9	196.3	8.6	123.2	79.0	2.7	9.5	71.6	123.8	13.9	191.0	0.2	28.8	175.9	1.4	16.5	187.0	–	204.9	–	–	76.2	128.7	–	–	–	203.3	1.6	–
Wyoming	*138.1*	*6.9*	*130.9*	*7.2*	*112.0*	*26.1*	–	*9.5*	*43.4*	*85.2*	–	*138.1*	*0.2*	*19.9*	*118.0*	–	*7.8*	*130.3*	–	*138.1*	–	–	*57.3*	*80.8*	–	–	–	*137.9*	*0.2*	–
Colorado	*66.8*	–	*65.4*	*1.4*	*11.2*	*52.9*	*2.7*	–	*28.2*	*38.6*	*13.9*	*52.9*	–	*8.9*	*57.9*	*1.4*	*8.7*	*56.7*	–	*66.8*	–	–	*18.9*	*47.9*	–	–	–	*65.4*	*1.4*	–
WYCO-B-2 (Agency Preferred Alternative)	204.5	6.9	195.9	8.6	125.4	76.4	2.7	9.5	69.4	125.6	13.9	190.6	0.2	28.8	175.5	1.3	15.8	187.4	–	204.5	–	–	75.9	128.6	–	–	–	203.0	1.5	–
Wyoming	*138.1*	*6.9*	*130.9*	*7.2*	*112.0*	*26.1*	–	*9.5*	*43.4*	*85.2*	–	*138.1*	*0.2*	*19.9*	*118.0*	–	*7.8*	*130.3*	–	*138.1*	–	–	*57.3*	*80.8*	–	–	–	*137.9*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*13.4*	*50.3*	*2.7*	–	*26.0*	*40.4*	*13.9*	*52.5*	–	*8.9*	*57.5*	*1.3*	*8.0*	*57.1*	–	*66.4*	–	–	*18.6*	*47.8*	–	–	–	*65.1*	*1.3*	–
WYCO-B-3	204.5	6.9	195.9	8.6	124.3	77.5	2.7	9.5	70.0	125.0	15.4	189.1	0.2	28.7	175.6	1.3	16.4	186.8	–	204.5	–	–	76.1	128.4	–	–	–	203.0	1.5	–
Wyoming	*138.1*	*6.9*	*130.9*	*7.2*	*112.0*	*26.1*	-	*9.5*	*43.4*	*85.2*	–	*138.1*	*0.2*	*19.9*	*118.0*	–	*7.8*	*130.3*	–	*138.1*	–	–	*57.3*	*80.8*	–	–	–	*137.9*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*12.3*	*51.4*	*2.7*	–	*26.6*	*39.8*	*15.4*	*51.0*	–	*8.8*	*57.6*	*1.3*	*8.6*	*56.5*	–	*66.4*	–	–	*18.8*	*47.6*	–	–	–	*65.1*	*1.3*	–
Alternative WYCO-C and Route Variations																														
WYCO-C	210.4	6.9	201.0	9.4	133.8	73.9	2.7	9.3	74.9	126.2	15.7	194.7	0.2	26.8	183.4	1.4	15.0	194.0	–	210.4	–	–	73.3	137.1	–	–	–	208.8	1.6	–
Wyoming	*144.0*	*6.9*	*136.0*	*8.0*	*122.6*	*21.4*	–	*9.3*	*48.5*	*86.2*	–	*144.0*	*0.2*	*17.9*	*125.9*	–	*6.3*	*137.7*	–	*144.0*	–	–	*54.4*	*89.6*	–	–	–	*143.8*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*11.2*	*52.5*	*2.7*	–	*26.4*	*40.0*	*15.7*	*50.7*	–	*8.9*	*57.5*	*1.4*	*8.7*	*56.3*	–	*66.4*	–	–	*18.9*	*47.5*	–	–	–	*65.0*	*1.4*	–
WYCO-C-1	210.8	6.9	201.4	9.4	133.8	74.3	2.7	9.3	76.7	124.8	13.9	196.9	0.2	26.8	183.8	1.4	15.0	194.4	–	210.8	–	–	73.3	137.5	–	–	–	205.2	1.6	–
Wyoming	*144.0*	*6.9*	*136.0*	*8.0*	*122.6*	*21.4*	–	*9.3*	*48.5*	*86.2*	–	*144.0*	*0.2*	*17.9*	*125.9*	–	*6.3*	*137.7*	–	*144.0*	–	–	*54.4*	*89.6*	–	–	–	*139.8*	*0.2*	–
Colorado	*66.8*	–	*65.4*	*1.4*	*11.2*	*52.9*	*2.7*	–	*28.2*	*38.6*	*13.9*	*52.9*	–	*8.9*	*57.9*	*1.4*	*8.7*	*56.7*	–	*66.8*	–	–	*18.9*	*47.9*	–	–	–	*65.4*	*1.4*	–
WYCO-C-2	210.4	6.9	201.0	9.4	136.0	71.7	2.7	9.3	74.5	126.6	15.3	195.1	0.2	26.3	183.9	1.3	14.3	194.8	–	210.4	–	–	73.0	137.4	–	–	–	208.9	1.5	–
Wyoming	*144.0*	*6.9*	*136.0*	*8.0*	*122.6*	*21.4*	–	*9.3*	*48.5*	*86.2*	–	*144.0*	*0.2*	*17.9*	*125.9*	–	*6.3*	*137.7*	–	*144.0*	–	–	*54.4*	*89.6*	–	–	–	*143.8*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*13.4*	*50.3*	*2.7*	–	*26.0*	*40.4*	*15.3*	*51.1*	–	*8.4*	*58.0*	*1.3*	*8.0*	*57.1*	–	*66.4*	–	–	*18.6*	*47.8*	–	–	–	*65.1*	*1.3*	–
WYCO-C-3	210.4	6.9	201.0	9.4	134.9	72.8	2.7	9.3	75.1	126.0	15.4	195.0	0.2	26.7	183.5	1.3	14.9	194.2	–	210.4	–	–	73.2	137.2	–	–	–	208.9	1.5	–
Wyoming	*144.0*	*6.9*	*136.0*	*8.0*	*122.6*	*21.4*	–	*9.3*	*48.5*	*86.2*	–	*144.0*	*0.2*	*17.9*	*125.9*	–	*6.3*	*137.7*	–	*144.0*	–	–	*54.4*	*89.6*	–	–	–	*143.8*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*12.3*	*51.4*	*2.7*	–	*26.6*	*39.8*	*15.4*	*51.0*	–	*8.8*	*57.6*	*1.3*	*8.6*	*56.5*	–	*66.4*	–	–	*18.8*	*47.6*	–	–	–	*65.1*	*1.3*	–
Alternative WYCO-D and Route Variation																														
WYCO-D	250.0	6.3	240.2	9.8	121.0	120.4	8.6	7.0	83.7	159.3	26.2	223.8	0.8	25.3	223.9	1.1	16.8	232.1	–	250.0	–	–	90.6	159.4	–	–	–	248.1	1.9	–
Wyoming	*135.0*	*6.3*	*131.8*	*3.2*	*110.0*	*25.0*	–	*6.8*	*42.3*	*85.9*	–	*135.0*	*0.8*	*14.5*	*119.7*	–	*3.3*	*131.7*	–	*135.0*	–	–	*63.9*	*71.1*	–	–	–	*134.2*	*0.8*	–
Colorado	*115.0*	–	*108.4*	*6.6*	*11.0*	*95.4*	*8.6*	*0.2*	*41.4*	*73.4*	*26.2*	*88.8*	–	*10.8*	*104.2*	*1.1*	*13.5*	*100.4*	–	*115.0*	–	–	*26.7*	*88.3*	–	–	–	*113.9*	*1.1*	–
WYCO-D-1	250.0	6.3	240.2	9.8	122.1	119.3	8.6	7.0	83.9	159.1	25.9	224.1	0.8	25.2	224.0	1.0	16.7	232.3	–	250.0	–	–	90.5	159.5	–	–	–	248.2	1.8	–
Wyoming	*135.0*	*6.3*	*131.8*	*3.2*	*110.0*	*25.0*	-	*6.8*	*42.3*	*85.9*	–	*135.0*	*0.8*	*14.5*	*119.7*	–	*3.3*	*131.7*	–	*135.0*	–	–	*63.9*	*71.1*	–	–	–	*134.2*	*0.8*	–
Colorado	*115.0*	–	*108.4*	*6.6*	*12.1*	*94.3*	*8.6*	*0.2*	*41.6*	*73.2*	*25.9*	*89.1*	–	*10.7*	*104.3*	*1.0*	*13.4*	*100.6*	–	*115.0*	–	–	*26.6*	*88.4*	–	–	–	*114.0*	*1.0*	–

TABLE 3-30
ALTERNATIVE ROUTE COMPARISON FOR EARTH RESOURCES INVENTORY DATA AND RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Geologic Hazards (miles crossed)						Mineral Resources (miles)			Soil Resources (miles crossed)								Miles of Residual Impacts (miles crossed)											
			Flooding		Landslide Susceptibility						Farmland		Water Erosion Susceptibility			Wind Erosion Susceptibility			Geologic Hazards				Mineral Resources				Soil Resources			
		Mine Subsidence (miles)	Low	Moderate	Low or None	Moderate	High	High	Moderate	Low	High	Low	High	Moderate	Low	High	Moderate	Low	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High
Alternative WYCO-F and Route Variations																														
WYCO-F	218.9	6.9	210.3	8.6	129.8	86.4	2.7	9.6	59.7	149.6	15.7	203.2	0.2	27.4	191.3	1.4	13.9	203.6	–	218.9	–	–	88.6	130.3	–	–	–	217.3	1.6	–
Wyoming	*152.5*	*6.9*	*145.3*	*7.2*	*118.6*	*33.9*	–	*9.6*	*33.3*	*109.6*	–	*152.5*	*0.2*	*18.5*	*133.8*	–	*5.2*	*147.3*	–	*152.5*	–	–	*69.7*	*82.8*	–	–	–	*152.3*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*11.2*	*52.5*	*2.7*	–	*26.4*	*40.0*	*15.7*	*50.7*	–	*8.9*	*57.5*	*1.4*	*8.7*	*56.3*	–	*66.4*	–	–	*18.9*	*47.5*	–	–	–	*65.0*	*1.4*	–
WYCO-F-1	219.3	6.9	210.7	8.6	129.8	86.8	2.7	9.6	61.5	148.2	13.9	205.4	0.2	27.4	191.7	1.4	13.9	204.0	–	219.3	–	–	88.6	130.7	–	–	–	217.7	1.6	–
Wyoming	*152.5*	*6.9*	*145.3*	*7.2*	*118.6*	*33.9*	–	*9.6*	*33.3*	*109.6*	–	*152.5*	*0.2*	*18.5*	*133.8*	–	*5.2*	*147.3*	–	*152.5*	–	–	*69.7*	*82.8*	–	–	–	*152.3*	*0.2*	–
Colorado	*66.8*	-	*65.4*	*1.4*	*11.2*	*52.9*	*2.7*	–	*28.2*	*38.6*	*13.9*	*52.9*	–	*8.9*	*57.9*	*1.4*	*8.7*	*56.7*	–	*66.8*	–	–	*18.9*	*47.9*	–	–	–	*65.4*	*1.4*	–
WYCO-F-2	218.9	6.9	210.3	8.6	132.0	84.2	2.7	9.6	59.3	150.0	15.3	203.6	0.2	26.9	191.8	1.3	13.2	204.4	–	218.9	–	–	88.3	130.6	–	–	–	217.4	1.5	–
Wyoming	*152.5*	*6.9*	*145.3*	*7.2*	*118.6*	*33.9*	–	*9.6*	*33.3*	*109.6*	–	*152.5*	*0.2*	*18.5*	*133.8*	–	*5.2*	*147.3*	–	*152.5*	–	–	*69.7*	*82.8*	–	–	–	*152.3*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*13.4*	*50.3*	*2.7*	–	*26.0*	*40.4*	*15.3*	*51.1*	–	*8.4*	*58.0*	*1.3*	*8.0*	*57.1*	–	*66.4*	–	–	*18.6*	*47.8*	–	–	–	*65.1*	*1.3*	–
WYCO-F-3	218.9	6.9	210.3	8.6	130.9	85.3	2.7	9.6	59.9	149.4	15.4	203.5	0.2	27.3	191.4	1.3	13.8	203.8	–	218.9	–	–	88.5	130.4	–	–	–	217.4	1.5	–
Wyoming	*152.5*	*6.9*	*145.3*	*7.2*	*118.6*	*33.9*	–	*9.6*	*33.3*	*109.6*	–	*152.5*	*0.2*	*18.5*	*133.8*	–	*5.2*	*147.3*	–	*152.5*	–	–	*69.7*	*82.8*	–	–	–	*152.3*	*0.2*	–
Colorado	*66.4*	–	*65.0*	*1.4*	*12.3*	*51.4*	*2.7*	–	*26.6*	*39.8*	*15.4*	*51.0*	–	*8.8*	*57.6*	*1.3*	*8.6*	*56.5*	–	*66.4*	–	–	*18.8*	*47.6*	–	–	–	*65.1*	*1.3*	–

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Alternative COUT BAX-B

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT BAX-B in Colorado crosses 1.8 miles of areas with potential mine subsidence, 16.6 miles of areas with moderate flood susceptibility and 18.1 miles of areas with high landslide susceptibility and 51.2 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-B in Colorado crosses 17.9 miles of lands designated as Prime or Unique Farmland soils; no soils highly susceptible to water erosion and 15.6 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 18.5 miles of soils moderately susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-B in Colorado crosses 7.3 miles of active mines or producing wells; 53.0 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 26.4 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-B, the alternative route crosses 1.8 miles of areas that could pose moderate impacts and 84.9 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-B, there would be 86.7 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-B would include an estimated 3,194 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 252 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,272 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-B, there would be 79.5 miles of low impacts on mineral resources (Table 3-31 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT BAX-B in Utah crosses 0.3 mile of areas with potential mine subsidence, 1.5 miles of areas with Quaternary faults; 29.0 miles of areas with moderate flood susceptibility; and 29.0 miles of

areas with high landslide susceptibility and 79.8 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-B in Utah crosses 11.0 miles of lands designated as Prime or Unique Farmland soils; 0.9 mile of soils highly susceptible to water erosion and 17.2 miles of soils moderately susceptible to water erosion; and 1.6 miles of soils highly susceptible to wind erosion and 13.0 miles of soils moderately susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-B in Utah crosses 6.2 miles of active mines or producing wells; 101.9 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 84.4 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Utah)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-B, the alternative route crosses 13.7 miles of areas that could pose moderate impacts and 178.8 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-B, there would be 2.5 miles of moderate impacts on soils highly susceptible to water erosion along Link U630 in Potters Canyon, Link U650 east of Nephi, Utah, and Link U732 near Little Cedar Mountain, and 1.6 miles of moderate impacts on soils highly susceptible to wind erosion along Link U629 west of Huntington, Utah; and 190.0 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-B would also include an estimated 3,194 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 252 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,272 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-B, there would be 174.3 miles of low impacts on mineral resources (Table 3-31 and MV-4).

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-B could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT BAX-C

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT BAX-C in Colorado crosses 1.8 mile of areas with potential mine subsidence, 16.6 miles of areas with moderate flood susceptibility, and 18.1 miles of areas with high landslide susceptibility and 51.2 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-C in Colorado crosses 17.9 miles of lands designated as Prime or Unique Farmland soils; no soils highly susceptible to water erosion and 15.6 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 18.5 miles of soils moderately susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-C in Colorado crosses 7.3 miles of active mines or producing wells; 53.0 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 26.4 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-C, the alternative route crosses 1.8 miles of areas that could pose moderate impacts and 84.9 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-C, there would be 86.7 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-C would also include an estimated 3,314 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 255 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,332 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-C, there would be 79.5 miles of low impacts on mineral resources (Table 3-31 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT BAX-C in Utah crosses 0.3 mile of areas with potential mine subsidence; 1.5 miles of areas with Quaternary faults; 24.5 miles of areas with moderate flood susceptibility; and 28.4 miles of areas with high landslide susceptibility and 71.7 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-C in Utah crosses 11.0 miles of lands designated as Prime or Unique Farmland soils; 0.9 mile of soils highly susceptible to water erosion and 17.9 miles of soils moderately susceptible to water erosion; and 1.0 mile of soils highly susceptible to wind erosion and 7.3 miles of soils moderately susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-C in Utah crosses 6.4 miles of active mines or producing wells; 106.2 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 90.4 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Utah)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-C, the alternative route crosses 13.7 miles of areas that could pose moderate impacts and 189.3 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-C, there would be 0.9 mile of moderate impacts on soils highly susceptible to water erosion along Link U630 in Potters Canyon, Link U650 east of Nephi, Utah; and U732 near Little Cedar Mountain, 1.0 mile of moderate impacts on soils highly susceptible to wind erosion along Link U629 west of Huntington, Utah; and 201.1 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-C would also include an estimated 3,314 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 255 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,332 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-C, there would be 184.8 miles of low impacts on mineral resources (Table 3-31 and MV-4).

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-C could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT BAX-E

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT BAX-E in Colorado crosses 1.8 mile of areas with potential mine subsidence, 16.6 miles of areas with areas with moderate flood susceptibility and 18.1 miles of areas with high landslide susceptibility and 51.2 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-E in Colorado crosses 17.9 miles of lands designated as Prime or Unique Farmland soils; no soils highly susceptible to water erosion and 15.6 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 18.5 miles of soils moderately susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-E in Colorado crosses 7.3 miles of active mines or producing wells; 53.0 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 26.4 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-E, the alternative route crosses 1.8 miles of areas that pose moderate impacts and 84.9 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-E, there would be 86.7 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-E would also include an estimated 3,336 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 255 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,244 acres of vegetation clearing in the right-of-way for Colorado and Utah. Alternative COUT BAX-E would have the greatest impacts on farmlands of all the alternative routes in the COUT BAX group.

Mineral Resources

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-E, there would be 79.5 miles of low impacts on mineral resources (Table 3-31 and MV-4). High and moderate impacts would include potential impacts on oil and gas leases, mines, and geothermal resources along Links 45, 66, and 381.

Affected Environment (Utah)

Geologic Hazards

Alternative COUT BAX-E in Utah crosses 3.8 mile of areas with potential mine subsidence; 1.8 miles of areas with Quaternary faults; 27.7 miles of areas with moderate flood susceptibility; and 20.5 miles of

areas with high landslide susceptibility and 70.0 miles of areas with moderate landslide susceptibility (Table 3-31 and MV-2).

Soil Resources

Alternative COUT BAX-E in Utah crosses 14.6 miles of lands designated as Prime or Unique Farmland soils; 0.9 mile of soils highly susceptible to water erosion and 18.3 miles of soils moderately susceptible to water erosion; 3.7 miles of soils moderately susceptible to wind erosion and no soils highly susceptible to wind erosion (Table 3-31 and MV-3).

Mineral Resources

Alternative COUT BAX-E in Utah crosses 11.7 miles of active mines or producing wells; 106.5 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 86.6 miles of potential mineral resources (Table 3-31 and MV-4).

Environmental Consequences (Utah)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT BAX-E, the alternative route crosses 12.6 miles of areas that could pose moderate impacts and 192.2 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-31 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT BAX-E, there would be 0.9 mile of moderate impacts on soils highly susceptible to water erosion along Link U600 on the Manti-La Sal National Forest and Links U636 and U650 east of Nephi, Utah; and 203.9 miles of low impacts on soil resources (Table 3-31 and MV-3). Alternative COUT BAX-E would also include an estimated 3,336 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 255 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,244 acres of vegetation clearing in the right-of-way for Colorado and Utah. Alternative COUT BAX-E would have the greatest impacts on farmlands of all the alternative routes in the COUT BAX group.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT BAX-E, there would be 186.9 miles of low impacts on mineral resources (Table 3-31 and MV-4).

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-E could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

TABLE 3-31
ALTERNATIVE ROUTE COMPARISON FOR EARTH RESOURCES INVENTORY DATA AND RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Geologic Hazards (miles crossed)							Mineral Resources (miles)			Soil Resources (miles crossed)								Miles of Residual Impacts (miles crossed)											
		Mine Subsidence (miles)	Quaternary Faults	Flooding		Landslide Susceptibility						Farmland		Water Erosion Susceptibility			Wind Erosion Susceptibility			Geologic Hazards				Mineral Resources				Soil Resources			
				Low	Moderate	Low or None	Moderate	High	High	Moderate	Low	High	Low	High	Moderate	Low	High	Moderate	Low	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High
COUT BAX-B	279.2	2.1	1.5	233.6	45.6	101.1	131.0	47.1	13.5	154.9	110.8	28.9	250.3	0.9	32.8	245.5	1.6	31.5	246.1	–	263.7	15.5	–	25.4	253.8	–	–	–	276.7	2.5	–
Colorado	*86.7*	*1.8*	*–*	*70.1*	*16.6*	*17.4*	*51.2*	*18.1*	*7.3*	*53.0*	*26.4*	*17.9*	*68.8*	*–*	*15.6*	*71.1*	*–*	*18.5*	*68.2*	*–*	*84.9*	*1.8*	*–*	*7.2*	*79.5*	*–*	*–*	*–*	*86.7*	*–*	*–*
Utah	*192.5*	*0.3*	*1.5*	*163.5*	*29.0*	*83.7*	*79.8*	*29.0*	*6.2*	*101.9*	*84.4*	*11.0*	*181.5*	*0.9*	*17.2*	*174.4*	*1.6*	*13.0*	*177.9*	*–*	*178.8*	*13.7*	*–*	*18.2*	*174.3*	*–*	*–*	*–*	*190.0*	*2.5*	*–*
COUT BAX-C	289.7	2.1	1.5	248.6	41.1	120.3	122.9	46.5	13.7	159.2	116.8	28.9	260.8	0.9	33.5	255.3	1.0	25.8	262.9	–	274.2	15.5	–	25.4	264.3	–	–	–	287.8	1.9	–
Colorado	*86.7*	*1.8*	*–*	*70.1*	*16.6*	*17.4*	*51.2*	*18.1*	*7.3*	*53.0*	*26.4*	*17.9*	*68.8*	*–*	*15.6*	*71.1*	*–*	*18.5*	*68.2*	*–*	*84.9*	*1.8*	*–*	*7.2*	*79.5*	*–*	*–*	*–*	*86.7*	*–*	*–*
Utah	*203.0*	*0.3*	*1.5*	*178.5*	*24.5*	*102.9*	*71.7*	*28.4*	*6.4*	*106.2*	*90.4*	*11.0*	*192.0*	*0.9*	*17.9*	*184.2*	*1.0*	*7.3*	*194.7*	*–*	*189.3*	*13.7*	*–*	*18.2*	*184.8*	*–*	*–*	*–*	*201.1*	*1.9*	*–*
COUT BAX-E	291.5	5.6	1.8	247.2	44.3	131.7	121.2	38.6	19.0	159.5	113.0	32.5	259.0	0.9	33.9	256.7	–	22.2	269.3	–	277.1	14.4	–	25.1	266.4	–	–	–	290.6	0.9	–
Colorado	*86.7*	*1.8*	*–*	*70.1*	*16.6*	*17.4*	*51.2*	*18.1*	*7.3*	*53.0*	*26.4*	*17.9*	*68.8*	*–*	*15.6*	*71.1*	*–*	*18.5*	*68.2*	*–*	*84.9*	*1.8*	*–*	*7.2*	*79.5*	*–*	*–*	*–*	*86.7*	*–*	*–*
Utah	*204.8*	*3.8*	*1.8*	*177.1*	*27.7*	*114.3*	*70.0*	*20.5*	*11.7*	*106.5*	*86.6*	*14.6*	*190.2*	*0.9*	*18.3*	*185.6*	*–*	*3.7*	*201.1*	*–*	*192.2*	*12.6*	*–*	*17.9*	*186.9*	*–*	*–*	*–*	*203.9*	*0.9*	*–*

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT-A and Route Variation COUT-A-1 in Colorado cross 3.7 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-A and Route Variation COUT-A-1 in Colorado cross 3.6 miles of lands designated as Prime or Unique Farmland soils; 0.5 mile of soils highly susceptible to water erosion and 2.0 miles of soils moderately susceptible to water erosion; and 0.3 mile of soils highly susceptible to wind erosion and 2.4 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-A and Route Variation COUT-A-1 in Colorado cross 2.1 miles of active mines or producing wells; 10.6 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 11.3 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-A and Route Variation COUT-A-1, the alternative routes cross 24.0 miles of areas that could pose low impacts on the Project from geological hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-A and Route Variation COUT-A-1, there would be 0.5 mile of moderate impacts on soils highly susceptible to water erosion along Link UC186 near Dinosaur, Colorado; 0.3 mile of moderate impacts on soils highly susceptible to wind erosion along Link C186 near Dinosaur, Colorado; and 23.2 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-A would also include an estimated 2,357 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 230 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 1,901 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-A and Route Variation COUT-A-1, there would be 21.7 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT-A in Utah crosses 0.6 mile of areas with Quaternary faults; 53.4 miles of areas with moderate flood susceptibility; and 32.3 miles of areas with high landslide susceptibility and 40.9 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Route Variation COUT-A-1 in Utah crosses 0.1 fewer mile of areas with Quaternary faults; 0.1 mile more of areas with moderate flood susceptibility; 0.8 mile more of areas with high landslide susceptibility and 0.4 fewer mile of areas with moderate landslide susceptibility than Alternative COUT-A.

Soil Resources

Alternative COUT-A in Utah crosses 11.2 miles of lands designated as Prime or Unique Farmland soils; 7.8 miles of soils highly susceptible to water erosion; and 13.7 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 24.0 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Route Variation COUT-A-1 in Utah crosses 0.2 mile more of soils highly susceptible to water erosion, 1.1 fewer miles of soils moderately susceptible to water erosion, and 0.6 mile more of soils moderately susceptible to wind erosion.

Mineral Resources

Alternative COUT-A crosses in Utah 9.1 miles of active mines or producing wells; 55.9 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 117.0 miles of potential mineral resources (Table 3-32 and MV-4).

Route Variation COUT-A-1 in Utah crosses 0.1 fewer mile of active mines or producing wells and 0.3 fewer mile of permitted mines, coal leases, oil and gas leases, or geothermal leases than Alternative COUT-A.

Environmental Consequences (Utah)

Geologic Hazards

Alternative COUT-A

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-A, the alternative route crosses 23.2 miles of areas that could pose moderate impacts and 158.8 miles of areas that could pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative COUT-A Route Variation (COUT-A-1)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measure 3 (Table 2-13) along Route Variation COUT-A-1, there would be 0.1 fewer mile of moderate impacts on the Project from geologic hazards than along Alternative COUT-A. Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Alternative COUT-A

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-A, there would be 7.8 miles of moderate impacts on soils highly susceptible to water erosion along Link U433 near Sheep Creek and Link U650 east of Nephi, Utah, and 174.2 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-A would also include an estimated 2,357 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 230 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 1,901 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Alternative COUT-A Route Variation (COUT-A-1)

Following implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variation COUT-A-1, there would be 0.2 mile more of moderate impacts on soils resources than along Alternative COUT-A.

Mineral Resources

Alternative COUT-A

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-A, there would be 159.3 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Alternative COUT-A Route Variation (COUT-A-1)

Following implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variation COUT-A-1, there would be 0.4 fewer mile of low impacts on mineral resources than along Alternative COUT-A.

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT-A and Route Variation COUT-A-1 could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado cross 3.7 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado cross 3.6 miles of lands designated as Prime or Unique Farmland soils; 0.5 mile of soils highly susceptible to water erosion and 2.0 miles of soils moderately susceptible to water erosion; and 0.3 mile of soils highly susceptible to wind erosion and 2.4 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado cross 2.1 miles of active mines or producing wells; 10.6 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 11.3 miles of potential mineral resources (Table 3-32 and MV-4).

<u>Environmental Consequences (Colorado)</u>

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Mitigation Measure 3 (Table 2-13) along Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5; the alternative route and variations cross 24.0 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, COUT-B-5; there would be 0.5 mile of moderate impacts on soils highly susceptible to water erosion along Link C186 near Dinosaur, Colorado; 0.3 mile of moderate impacts on soils highly susceptible to wind erosion along Link C186 near Dinosaur, Colorado, and 23.2 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-B would also include an estimated 2,473 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 233 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,166 acres of vegetation clearing in the right-of-way for Colorado and Utah. Alternative COUT-B and its route variations would have a greater impact on farmlands than the other alternative routes in the COUT group and Route Variation COUT-B-1 would have the greatest impact on soils with high susceptibility to water erosion.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5; there would be 21.7 miles of low impacts on mineral resources (Table 3-32 and MV-4).

<u>Affected Environment (Utah)</u>

Geologic Hazards

Alternative COUT-B in Utah crosses 0.8 mile of areas with Quaternary faults; 43.5 miles of areas with flood susceptibility; and 32.9 miles of areas with high landslide susceptibility and 63.4 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Route Variation COUT-B-1 crosses 4.4 miles more of areas with moderate flood susceptibility and 5.4 miles more of areas with high landslide susceptibility than Alternative COUT-B. Route Variation COUT-B-2 crosses 2.6 miles more of areas with moderate flood susceptibility and 9.0 miles more of areas with high flood susceptibility than Alternative COUT-B. Route Variation COUT-B-3 crosses 3.3 miles more of areas with moderate flood susceptibility and 8.3 miles more of areas with high flood susceptibility than Alternative COUT-B. Route Variation COUT-B-4 crosses 2.9 miles more of areas with moderate flood susceptibility and 8.8 miles more of areas with high landslide susceptibility than Alternative COUT-B. Route Variation COUT-B-5 crosses 3.0 miles more of areas with moderate flood susceptibility and 8.5 miles more of areas with high landslide susceptibility than Alternative COUT-B.

Soil Resources

Alternative COUT-B in Utah crosses 11.8 miles of lands designated as Prime or Unique Farmland soils; 10.3 miles of soils highly susceptible to water erosion and 16.6 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 25.1 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Route Variation COUT-B-1 in Utah crosses 1.8 mile more of soils highly susceptible to water erosion, 1.4 fewer miles of soils moderately susceptible to water erosion, and 2.5 fewer miles of soils moderately susceptible to wind erosion than Alternative COUT-B. Route Variation COUT-B-2 in Utah crosses 1.6 miles more of soils highly susceptible to water erosion, 1.9 fewer mile of soil moderately susceptible to water erosion, and 2.4 fewer miles of soils moderately susceptible to wind erosion than Alternative COUT-B. Route Variation COUT-B-3 in Utah crosses 1.7 fewer miles of soils moderately susceptible to water erosion and 2.7 fewer miles of soils moderately susceptible to wind erosion than Alternative COUT-B. Route Variation COUT-B-4 in Utah crosses 1.6 mile more of soils highly susceptible to water erosion, 1.7 fewer miles of soils moderately susceptible to water erosion, and 2.5 fewer miles of soils moderately susceptible to wind erosion than Alternative COUT-B. Route Variation COUT-B-5 in Utah crosses 1.9 fewer miles of soils moderately susceptible to water erosion and 2.6 fewer miles of soils moderately susceptible to wind erosion than Alternative COUT-B. Alternative COUT-B and its route variations have the greatest impact on farmlands than the other alternative routes in the COUT group, and Route Variation COUT-B-1 has the greatest impacts on soils with high susceptibility to water erosion.

Mineral Resources

Alternative COUT-B in Utah crosses 11.5 miles of active mines or producing wells; 65.8 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 114.7 miles of potential mineral resources (Table 3-32 and MV-4).

Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah cross 0.6 fewer mile of active mines or producing wells.

Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah cross 5.2, 4.4, 5.5, 3.9, and 6.0, respectively, fewer miles of permitted mines, coal leases, oil and gas leases, or geothermal leases than Alternative COUT-B.

<u>Environmental Consequences (Utah)</u>

Geologic Hazards

Alternative COUT-B

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-B, the alternative route crosses 13.3 miles of

areas that pose moderate impacts and 178.7 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Following implementation of the design features of the Proposed Action and Selective Mitigation Measure 3 (Table 2-13) along Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5; potential impacts on the Project from geologic hazards would be greater than along Alternative COUT-B. Route Variation COUT-B-1 crosses 3.9 miles more of areas that pose moderate impacts on the Project from geologic hazards than Alternative COUT-B. Route Variation COUT-B-2 crosses 2.5 miles more of areas that pose moderate impacts on the Project from geologic hazards than Alternative COUT-B. Route Variation COUT-B-3 crosses 3.1 miles more of areas that pose moderate impacts on the Project from geologic hazards than Alternative COUT-B. Route Variations COUT-B-4 and COUT-B-5 cross 2.8 fewer miles of areas that pose moderate impacts on the Project from geologic hazards than Alternative COUT-B.

Soil Resources

Alternative COUT-B

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-B, there would be 10.3 miles of moderate impacts on soils highly susceptible to water erosion along Link U431 and U432 in Argyle Canyon, Link U530 and U539 along Soldier Creek, and Link U650 east of Nephi, Utah, and 181.7 miles of low impacts on soil resources Table 3-32 and MV-3). Alternative COUT-B would also include an estimated 2,473 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 233 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,166 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variation COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5, moderate impacts on soil resources would be greater than or equal to those along Alternative COUT-B. Route Variation COUT-B-1 crosses 1.8 miles more of moderate impacts on soils resources than Alternative COUT-B. Route Variations COUT-B-2 and COUT-B-4 cross 1.6 miles more of moderate impacts on soils resources than Alternative COUT-B. Route Variations COUT-B-3 and COUT-B-5 cross the same moderate impacts on soil resources as along Alternative COUT-B. Alternative COUT-B and its route variations would have a greater impact on farmlands than the other alternative routes in the COUT group, and Route Variation COUT-B-1 would have greatest impacts on soils with high susceptibility to water erosion.

Mineral Resources

Alternative COUT-B

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-B, there would be 169.3 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5; potential low impacts on mineral resources would be less than along Alternative COUT-B. Route Variation COUT-B-1 crosses 3.3 fewer miles of areas with low impacts on mineral resources than Alternative COUT-B. Route Variations COUT-B-2 and COUT-B-4 cross 1.8 fewer miles of areas with low impacts on mineral resources than Alternative COUT-B. Route Variations COUT-B-3 and COUT-B-5 cross 2.1 fewer miles of areas with low impacts on mineral resources than Alternative COUT-B.

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado cross 4.6 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado cross 4.2 miles of lands designated as Prime or Unique Farmland soils; 0.5 mile of soils highly susceptible to water erosion and 2.0 miles of soils moderately susceptible to water erosion; and 0.3 mile of soils highly susceptible to wind erosion and 2.4 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado cross 2.1 miles of active mines or producing wells; 13.8 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 8.9 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-C and route variations in Colorado, the alternative route crosses 24.8 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-C and route variations in Colorado, there would be 0.5 mile of moderate impacts on soils highly susceptible to water erosion along Link C186 near Dinosaur, Colorado; 0.3 mile of moderate impacts on soils highly susceptible to wind erosion along Link C186 near Dinosaur, Colorado; and 24.0 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-C would also include an estimated 2,401 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 231 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,235 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 along Alternative COUT-C and route variations in Colorado, there would be 22.5 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT-C in Utah crosses 0.3 mile of areas with Quaternary faults; 26.1 miles of areas with moderate flood susceptibility; and 35.1 miles of areas with high landslide susceptibility and 62.9 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah cross 8.6, 6.8, 7.2, 9.6, and 10.0 more miles of areas with moderate flood susceptibility; cross 12.7, 16.3, 15.8, 16.7, and 16.2, respectively, more miles of areas with high landslide susceptibility; and cross 7.8, 8.7, 8.6, 8.1, 8.0, respectively, fewer miles of areas with moderate landslide susceptibility.

Soil Resources

Alternative COUT-C in Utah crosses 3.0 miles of lands designated as Prime or Unique Farmland soils; 6.9 miles of soils highly susceptible to water erosion and 25.4 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and 22.1 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Route Variations COUT-C-1, COUT-C-2, and COUT-C-3 in Utah cross 0.8 fewer mile of lands designated as Prime or Unique Farmland. Route Variations COUT-C-4 and COUT-C-5 in Utah cross 0.6 fewer mile of lands designated as Prime or Unique Farmland.

Route Variation COUT-C-1 in Utah crosses 1.8 miles more of soils highly susceptible to water erosion. Route Variations COUT-C-2 and COUT-C-4 in Utah cross 1.6 miles more of soils highly susceptible to water erosion.

Route Variation COUT-C-1 in Utah crosses 11.5 fewer miles; COUT-C-2 and COUT-C-3 in Utah cross 12.0 fewer miles; and COUT-C-4 and COUT-C-5 in Utah cross 8.9 fewer miles of soils moderately susceptible to water erosion.

Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah cross 7.2, 7.1, 7.3, 5.1, and 5.3, respectively, fewer miles of soils moderately susceptible to wind erosion.

Mineral Resources

Alternative COUT-C in Utah crosses 19.0 miles of active mines or producing wells; 89.8 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 76.2 miles of potential mineral resources (Table 3-32 and MV-4).

Route Variations COUT-C-1, COUT-C-2, and COUT-C-3 in Utah cross 0.7 fewer mile of active mines or producing wells. Route Variations COUT-C-4 and COUT-C-5 in Utah cross 0.9 fewer mile of active mines or producing wells.

Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah cross 6.1, 5.3, 6.9, 4.2, and 5.8, respectively, fewer miles of permitted mines, coal leases, oil and gas leases, or geothermal leases.

<u>Environmental Consequences (Utah)</u>

Geologic Hazards

Alternative COUT-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-C, the alternative route crosses 19.7 miles of areas that pose moderate impacts and 165.3 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Following implementation of the design features of the Proposed Action and Selective Mitigation Measure 3 (Table 2-13) along Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah, impacts on the Project from geologic hazards would be greater than along Alternative COUT-C. Route Variation COUT-C-1 crosses 6.9 miles more of areas that pose moderate impacts on the Project from geologic hazards. Route Variation COUT-C-2 crosses 5.5 miles more of areas that pose moderate impacts on the Project from geologic hazards. Route Variation COUT-C-3 crosses 5.8 miles more of areas that pose moderate impacts on the Project from geologic hazards. Route Variation COUT-C-4 crosses 9.4 miles more of areas that pose moderate impacts on the Project from geologic hazards. Route Variation COUT-C-5 crosses 9.7 miles more of areas that pose moderate impacts on the Project from geologic hazards.

Soil Resources

Alternative COUT-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-C, in Utah there would be 6.9 miles of moderate impacts on soils highly susceptible to water erosion along Link U530 and U539 along Soldier Creek and Link U650 east of Nephi, Utah; and 178.1 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-C would also include an estimated 2,401 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 231 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,235 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Route Variation COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah, impacts on soils resources would be greater than or equal to those along Alternative COUT-C. Route Variation COUT-C-1 crosses 1.8 mile more of moderate impacts on soil resources than Alternative COUT-C. Route Variations COUT-C-2 and COUT-C-4 cross 1.6 mile more of moderate impacts on soil resources than Alternative COUT-C. Route Variations COUT-C-3 and COUT-C-5 cross the same impacts on soil resources as Alternative COUT-C.

Mineral Resources

Alternative COUT-C

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-C, there would be 162.3 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Following the implementation of the design features of the Proposed Action and Selective Mitigation Measures 2 and 7 (Table 2-13) along Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah, impacts on mineral resources would be less than along Alternative COUT-C. Route Variation COUT-C-1 crosses 3.4 fewer miles of low impacts on mineral resources than Alternative COUT-C. Route Variations COUT-C-2 and COUT-C-4 cross 1.9 fewer miles of low impacts on mineral resources than Alternative COUT-C. Route Variations COUT-C-3 and COUT-C-5 cross 2.2 fewer miles of low impacts on mineral resources than Alternative COUT-C.

<u>Results of U.S. Forest Service Specialist Report</u>

USFS evaluated whether implementation of Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4 and COUT-C-5 would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4 and COUT-C-5 could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT-H in Colorado crosses 4.6 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-H in Colorado crosses 4.2 miles of lands designated as Prime or Unique Farmland soils; 0.5 mile of soils highly susceptible to water erosion and 2.0 miles of soils moderately susceptible to water erosion; and 0.3 mile of soils highly susceptible to wind erosion and 2.4 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-H in Colorado crosses 2.1 miles of active mines or producing wells; 13.8 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 8.9 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-H, the alternative route crosses 24.8 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) along Alternative COUT-H, the alternative route crosses 0.5 mile of moderate impacts on soils highly susceptible to water erosion along Link C186 near Dinosaur, Colorado, 0.3 mile of moderate impacts on soils highly susceptible to wind erosion along Link C186 near Dinosaur, Colorado, and 24.0 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-H would also include an estimated 2,294 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 228 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,088 acres of vegetation clearing in the right-of-way for Colorado and Utah.

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-H, there would be 22.5 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT-H in Utah crosses 7.3 mile of areas with potential mine subsidence; 0.7 mile of areas with Quaternary faults; 24.8 miles of areas with moderate flood susceptibility; and 37.1 miles of areas

with high landslide susceptibility and 46.0 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-H in Utah crosses 7.8 miles of lands designated as Prime or Unique Farmland soils; 0.9 mile of soils highly susceptible to water erosion and 19.2 miles of soils moderately susceptible to water erosion; and no soils highly susceptible to wind erosion and crosses 15.0 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-H in Utah crosses 21.7 miles of active mines or producing wells; 85.1 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 69.0 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Utah)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-H, the alternative route crosses 21.0 miles of areas that pose moderate impacts and 165.3 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) the alternative route crosses 0.9 mile of moderate impacts on soils highly susceptible to water erosion along Link U600 on the Manti-La Sal National Forest and Link U636 near Fairview, Utah, and 174.9 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-H would also include an estimated 2,294 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 228acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,088 acres of vegetation clearing in the right-of-way for Colorado and Utah

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-H, there would be 158.3 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT-H would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found Alternative COUT-H could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

Alternative COUT-I

Affected Environment (Colorado)

Geologic Hazards

Alternative COUT-I in Colorado crosses 4.6 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-I in Colorado crosses 4.2 miles of lands designated as Prime or Unique Farmland soils; 0.5 mile of soils highly susceptible to water erosion and 2.0 miles of soils moderately susceptible to water erosion; 0.3 mile of soils highly susceptible to wind erosion and 2.4 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-I in Colorado crosses 2.1 miles of active mines or producing wells; 13.8 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 8.9 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Colorado)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-I, the alternative route crosses 24.8 miles of areas that pose low impacts on the Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) the alternative route crosses 0.5 mile of moderate impacts on soils highly susceptible to water erosion along Link C186 near Dinosaur, Colorado, 0.3 mile of moderate impacts on soils highly susceptible to wind erosion along Link C186 near Dinosaur, Colorado, and 24.0 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-I would also include an estimated 2,748 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 240 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,151 acres of vegetation clearing in the right-of-way for Colorado and Utah

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-I, there would be 22.5 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Affected Environment (Utah)

Geologic Hazards

Alternative COUT-I in Utah crosses 1.1 miles of areas with potential mine subsidence; 0.8 mile of areas with Quaternary faults; 26.4 miles of areas with moderate flood susceptibility; and 44.3 miles of areas with high landslide susceptibility and 48.8 miles of areas with moderate landslide susceptibility (Table 3-32 and MV-2).

Soil Resources

Alternative COUT-I in Utah crosses 8.8 miles of lands designated as Prime or Unique Farmland soils; 0.7 mile of soils highly susceptible to water erosion and 25.7 miles of soils moderately susceptible to water erosion; and 1.0 mile of soils highly susceptible to wind erosion and 18.6 miles of soils moderately susceptible to wind erosion (Table 3-32 and MV-3).

Mineral Resources

Alternative COUT-I in Utah crosses 24.3 miles of active mines or producing wells; 131.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases; and 59.7 miles of potential mineral resources (Table 3-32 and MV-4).

Environmental Consequences (Utah)

Geologic Hazards

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) along Alternative COUT-I, the alternative route crosses 21.0 miles of areas that pose moderate impacts and 194.4 miles of areas that pose low impacts on Project from geologic hazards (Table 3-32 and MV-2). Construction of the Project would not be anticipated to result in impacts on geologic hazards.

Soil Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7, and 13 (Table 2-13) the alternative route crosses 0.7 mile of moderate impacts on soils highly susceptible to water erosion along Link U630 east of Mount Pleasant, Utah, 1.0 mile of moderate impacts on soils highly susceptible to wind erosion along Link U629 near East Mountain, and 213.7 miles of low impacts on soil resources (Table 3-32 and MV-3). Alternative COUT-I would also include an estimated 2,748 acres of temporary disturbance (work areas, wire-tensioning sites, wire-splicing sites, construction yards, and guard structures), 240 acres of permanent disturbance (structure pad areas, regeneration stations, and substations), and 2,151 acres of vegetation clearing in the right-of-way for Colorado and Utah

Mineral Resources

Following the implementation of the design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) along Alternative COUT-I, there would be 197.2 miles of low impacts on mineral resources (Table 3-32 and MV-4).

Results of U.S. Forest Service Specialist Report

USFS evaluated whether implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to the earth resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Earth Resource Report which is available for review and download from the Project website. The analysis found Alternative COUT-I could be approved in compliance with standards, guidelines, and management objectives pertaining to earth resources contained in applicable USFS LRMPs.

TABLE 3-32
ALTERNATIVE ROUTE COMPARISON FOR EARTH RESOURCES INVENTORY DATA AND RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Geologic Hazards (miles)							Mineral Resources (miles)			Soil Resources (miles)								Miles of Residual Impacts											
				Flooding		Landslide Susceptibility						Farmland		Water Erosion Susceptibility			Wind Erosion Susceptibility			Geologic Hazards				Mineral Resources				Soil Resources			
		Mine Subsidence (miles)	Quaternary Faults	Low	Moderate	Low or None	Moderate	High	High	Moderate	Low	High	Low	High	Moderate	Low	High	Moderate	Low	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High
Alternative COUT-A and Route Variation																															
COUT-A	206.0	–	0.6	152.6	53.4	129.1	44.6	32.3	11.2	66.5	128.3	14.8	191.2	8.3	15.7	182.0	0.3	26.4	179.3	–	182.8	23.2	–	25.0	181.0	–	–	–	197.4	8.6	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*182.0*	–	*0.6*	*128.6*	*53.4*	*108.8*	*40.9*	*32.3*	*9.1*	*55.9*	*117.0*	*11.2*	*170.8*	*7.8*	*13.7*	*160.5*	–	*24.0*	*158.0*	–	*158.8*	*23.2*	–	*22.7*	*159.3*	–	–	–	*174.2*	*7.8*	–
COUT-A-1	205.6	–	0.5	152.1	53.5	128.3	44.2	33.1	11.1	66.2	128.3	14.8	190.8	8.5	14.6	182.5	0.3	27.0	178.3	–	182.5	23.1	–	25.0	180.6	–	–	–	196.8	8.8	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*181.6*	–	*0.5*	*128.1*	*53.5*	*108.0*	*40.5*	*33.1*	*9.0*	*55.6*	*117.0*	*11.2*	*170.4*	*8.0*	*12.6*	*161.0*	–	*24.6*	*157.0*	–	*158.5*	*23.1*	–	*22.7*	*158.9*	–	–	–	*173.6*	*8.0*	–
Alternative COUT-B and Route Variations																															
COUT-B	216.0	–	0.8	172.5	43.5	116.0	67.1	32.9	13.6	76.4	126.0	15.4	200.6	10.8	18.6	186.6	0.3	27.5	188.2	–	202.7	13.3	–	25.0	191.0	–	–	–	204.9	11.1	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*192.0*	–	*0.8*	*148.5*	*43.5*	*95.7*	*63.4*	*32.9*	*11.5*	*65.8*	*114.7*	*11.8*	*180.2*	*10.3*	*16.6*	*165.1*	–	*25.1*	*166.9*	–	*178.7*	*13.3*	–	*22.7*	*169.3*	–	–	–	*181.7*	*10.3*	–
COUT-B-1	212.7	–	0.8	164.8	47.9	107.5	66.9	38.3	13.0	71.2	128.5	15.4	197.3	12.6	17.2	182.9	0.3	25.0	187.4	–	195.5	17.2	-	25.0	187.7	–	–	–	199.8	12.9	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*188.7*	–	*0.8*	*140.8*	*47.9*	*87.2*	*63.2*	*38.3*	*10.9*	*60.6*	*117.2*	*11.8*	*176.9*	*12.1*	*15.2*	*161.4*	–	*22.6*	*166.1*	–	*171.5*	*17.2*	–	*22.7*	*166.0*	–	–	–	*176.6*	*12.1*	–
COUT-B-2	214.2	–	0.8	168.1	46.1	106.3	66.0	41.9	13.0	72.0	129.2	15.4	198.8	12.4	16.7	185.1	0.3	25.1	188.8	–	198.4	15.8	–	25.0	189.2	–	–	–	201.5	12.7	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*190.2*	–	*0.8*	*144.1*	*46.1*	*86.0*	*62.3*	*41.9*	*10.9*	*61.4*	*117.9*	*11.8*	*178.4*	*11.9*	*14.7*	*163.6*	–	*22.7*	*167.5*	–	*174.4*	*15.8*	–	*22.7*	*167.5*	–	–	–	*178.3*	*11.9*	–
COUT-B-3	213.9	–	0.8	167.1	46.8	106.4	66.3	41.2	13.0	70.9	130.0	15.4	198.5	10.8	16.9	186.2	0.3	24.8	188.8	–	197.5	16.4	–	25.0	188.9	–	–	–	202.8	11.1	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*189.9*	–	*0.8*	*143.1*	*46.8*	*86.1*	*62.6*	*41.2*	*10.9*	*60.3*	*118.7*	*11.8*	*178.1*	*10.3*	*14.9*	*164.7*	–	*22.4*	*167.5*	–	*173.5*	*16.4*	–	*22.7*	*167.2*	–	–	–	*179.6*	*10.3*	–
COUT-B-4	214.2	–	0.8	167.8	46.4	106.3	66.2	41.7	13.0	72.5	128.7	15.4	198.8	12.4	16.9	184.9	0.3	25.0	188.9	–	198.1	16.1	–	25.0	189.2	–	–	–	201.5	12.7	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*190.2*	–	*0.8*	*143.8*	*46.4*	*86.0*	*62.5*	*41.7*	*10.9*	*61.9*	*117.4*	*11.8*	*178.4*	*11.9*	*14.9*	*163.4*	–	*22.6*	*167.6*	–	*174.1*	*16.1*	–	*22.7*	*167.5*	–	–	–	*178.3*	*11.9*	–
COUT-B-5	213.9	–	0.8	167.4	46.5	106.4	66.1	41.4	13.0	70.4	130.5	15.4	198.5	10.8	16.7	186.4	0.3	24.9	188.7	–	197.8	16.1	–	25.0	188.9	–	–	–	202.8	11.1	–
Colorado	*24.0*	–	–	*24.0*	–	*20.3*	*3.7*	–	*2.1*	*10.6*	*11.3*	*3.6*	*20.4*	*0.5*	*2.0*	*21.5*	*0.3*	*2.4*	*21.3*	–	*24.0*	–	–	*2.3*	*21.7*	–	–	–	*23.2*	*0.8*	–
Utah	*189.9*	–	*0.8*	*143.4*	*46.5*	*86.1*	*62.4*	*41.4*	*10.9*	*59.8*	*119.2*	*11.8*	*178.1*	*10.3*	*14.7*	*164.9*	–	*22.5*	*167.4*	–	*173.8*	*16.1*	–	*22.7*	*167.2*	–	–	–	*179.6*	*10.3*	–

TABLE 3-32
ALTERNATIVE ROUTE COMPARISON FOR EARTH RESOURCES INVENTORY DATA AND RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Geologic Hazards (miles)							Mineral Resources (miles)			Soil Resources (miles)								Miles of Residual Impacts											
				Flooding		Landslide Susceptibility						Farmland		Water Erosion Susceptibility			Wind Erosion Susceptibility			Geologic Hazards				Mineral Resources				Soil Resources			
		Mine Subsidence (miles)	Quaternary Faults	Low	Moderate	Low or None	Moderate	High	High	Moderate	Low	High	Low	High	Moderate	Low	High	Moderate	Low	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High	No Identifiable	Low	Moderate	High
Alternative COUT-C and Route Variations																															
COUT-C	209.8	–	0.3	183.7	26.1	107.2	67.5	35.1	21.1	103.6	85.1	7.2	202.6	7.4	27.4	175.0	0.3	24.5	185.0	–	190.1	19.7	–	25.0	184.8	–	–	–	202.1	7.7	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*185.0*	–	*0.3*	*158.9*	*26.1*	*87.0*	*62.9*	*35.1*	*19.0*	*89.8*	*76.2*	*3.0*	*182*	*6.9*	*25.4*	*152.7*	–	*22.1*	*162.9*	–	*165.3*	*19.7*	–	*22.7*	*162.3*	–	–	–	*178.1*	*6.9*	–
COUT-C-1	206.4	–	0.3	171.7	34.7	98.9	59.7	47.8	20.4	97.5	88.5	6.4	200.0	9.2	15.9	181.3	0.3	17.3	188.8	–	179.8	26.6	–	25.0	181.4	–	–	–	196.9	9.5	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*181.6*	–	*0.3*	*146.9*	*34.7*	*78.7*	*55.1*	*47.8*	*18.3*	*83.7*	*79.6*	*2.2*	*179.4*	*8.7*	*13.9*	*159.0*	–	*14.9*	*166.7*	–	*155.0*	*26.6*	–	*22.7*	*158.9*	–	–	–	*172.9*	*8.7*	–
COUT-C-2	207.9	–	0.3	175.0	32.9	97.7	58.8	51.4	20.4	98.3	89.2	6.4	201.5	9.0	15.4	183.5	0.3	17.4	190.2	–	182.7	25.2	–	25.0	182.9	–	–	–	198.6	9.3	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*183.1*	–	*0.3*	*150.2*	*32.9*	*77.5*	*54.2*	*51.4*	*18.3*	*84.5*	*80.3*	*2.2*	*180.9*	*8.5*	*13.4*	*161.2*	–	*15.0*	*168.1*	–	*157.9*	*25.2*	–	*22.7*	*160.4*	–	–	–	*174.6*	*8.5*	–
COUT-C-3 (Agency Preferred Alternative)	207.6	–	0.3	174.3	33.3	97.8	58.9	50.9	20.4	96.7	90.5	6.4	201.2	7.4	15.4	184.8	0.3	17.2	190.1	–	182.1	25.5	–	25.0	182.6	–	–	–	199.9	7.7	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*182.8*	–	*0.3*	*149.5*	*33.3*	*77.6*	*54.3*	*50.9*	*18.3*	*82.9*	*81.6*	*2.2*	*180.6*	*6.9*	*13.4*	*162.5*	–	*14.8*	*168.0*	–	*157.3*	*25.5*	–	*22.7*	*160.1*	–	–	–	*175.9*	*6.9*	–
COUT-C-4	207.9	–	0.3	172.2	35.7	96.7	59.4	51.8	20.2	99.4	88.3	6.6	201.3	9.0	18.5	180.4	0.3	19.4	188.2	–	178.8	29.1	–	25.0	182.9	–	–	–	198.6	9.3	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*183.1*	–	*0.3*	*147.4*	*35.7*	*76.5*	*54.8*	*51.8*	*18.1*	*85.6*	*79.4*	*2.4*	*180.7*	*8.5*	*16.5*	*158.1*	–	*17.0*	*166.1*	–	*154.0*	*29.1*	–	*22.7*	*160.4*	–	–	–	*174.6*	*8.5*	–
COUT-C-5	207.6	–	0.3	171.5	36.1	96.8	59.5	51.3	20.2	97.8	89.6	6.6	201.0	7.4	18.5	181.7	0.3	19.2	188.1	–	178.2	29.4	–	25.0	182.6	–	–	–	199.9	7.7	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*182.8*	–	*0.3*	*146.7*	*36.1*	*76.6*	*54.9*	*51.3*	*18.1*	*84.0*	*80.7*	*2.4*	*180.4*	*6.9*	*16.5*	*159.4*	–	*16.8*	*166.0*	–	*153.4*	*29.4*	–	*22.7*	*160.1*	–	–	–	*175.9*	*6.9*	–
Alternatives COUT-H and COUT-I																															
COUT-H (Applicant Preferred Alternative)	200.6	7.3	0.7	175.8	24.8	112.9	50.6	37.1	23.8	98.9	77.9	12.0	188.6	1.4	21.2	178.0	0.3	17.4	182.9	–	179.6	21.0	–	19.8	180.8	–	–	–	198.9	1.7	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*175.8*	*7.3*	*0.7*	*151.0*	*24.8*	*92.7*	*46.0*	*37.1*	*21.7*	*85.1*	*69.0*	*7.8*	*168.0*	*0.9*	*19.2*	*155.7*	–	*15.0*	*160.8*	–	*154.8*	*21.0*	–	*17.5*	*158.3*	–	–	–	*174.9*	*0.9*	–
COUT-I	240.2	1.1	0.8	213.8	26.4	142.5	53.4	44.3	26.4	145.2	68.6	13.0	227.2	1.2	27.7	211.3	1.3	21.0	217.9	–	219.2	21.0	–	20.5	219.7	–	–	–	237.7	2.5	–
Colorado	*24.8*	–	–	*24.8*	–	*20.2*	*4.6*	–	*2.1*	*13.8*	*8.9*	*4.2*	*20.6*	*0.5*	*2.0*	*22.3*	*0.3*	*2.4*	*22.1*	–	*24.8*	–	–	*2.3*	*22.5*	–	–	–	*24.0*	*0.8*	–
Utah	*215.4*	*1.1*	*0.8*	*189.0*	*26.4*	*122.3*	*48.8*	*44.3*	*24.3*	*131.4*	*59.7*	*8.8*	*206.6*	*0.7*	*25.7*	*189.0*	*1.0*	*18.6*	*195.8*	–	*194.4*	*21.0*	–	*18.2*	*197.2*	–	–	–	*213.7*	*1.7*	–

3.2.2.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Geological Hazards

Siting Area A (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There are small areas of high susceptibility to flooding along Little Snake River.

Soil Resources

Siting Area A (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with high susceptibility to wind erosion, and low susceptibility to water erosion.

Mineral Resources

There is one coal lease, several oil and gas leases, and several producing oil and gas wells within Siting Area A (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate susceptibility to wind erosion.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Siting Area B – Nine Mile Basin

Affected Environment

Geological Hazards

Siting Area B (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There is one small area of high susceptibility to landslides along the southern portion of Siting Area B.

Soil Resources

Siting Area B (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with low susceptibility to wind and water erosion, and high susceptibility to water erosion.

Mineral Resources

There is one oil and gas lease within Siting Area B (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be mostly low with a small area of moderate susceptibility from impact from landslides.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate susceptibility to water erosion.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Siting Area C – Maybell

Affected Environment

Geological Hazards

Siting Area C (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There is one small area of moderate susceptibility to flooding along Yampa River.

Soil Resources

Siting Area C (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with moderate susceptibility to water erosion, and high susceptibility to wind erosion. There are several areas designated as Prime or Unique Farmland within Siting Area C.

Mineral Resources

There are three oil and gas lease within Siting Area C (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate impacts on farmlands.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Geological Hazards

Siting Area D (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There is one small area of high susceptibility to flooding along Sands Spring Gulch.

Soil Resources

Siting Area D (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with high susceptibility to wind erosion. There are also several areas designated as Prime or Unique Farmland within Siting Area D.

Mineral Resources

There are eight oil and gas leases within Siting Area D (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate impacts on farmlands.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Geological Hazards

Siting Area G (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There is one small area of high susceptibility to flooding near the center of the siting area.

Soil Resources

Siting Area G (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with low susceptibility to wind and water erosion.

Mineral Resources

There are three oil and gas lease within Siting Area G (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be low.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Geological Hazards

Siting Area F (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides. There is one area of moderate-high susceptibility to flooding near the Uinta River.

Soil Resources

Siting Area F (MV-3) lies mostly within areas designated as having moderate susceptibility to wind and water erosion, but there are several areas with low susceptibility to wind and water erosion, and one area with high susceptibility to wind and water erosion.

Mineral Resources

There is one oil and gas lease, and several active mines within Siting Area F (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate impacts on areas with high wind and water erosion susceptibility.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Geological Hazards

Siting Area E (MV-2) lies mostly within an area designated as having low susceptibility for flooding and moderate susceptibility for landslides.

Soil Resources

Siting Area E (MV-3) lies mostly within areas designated as having low-moderate susceptibility to wind and water erosion, but there are several areas with high susceptibility to water erosion.

Mineral Resources

There are three oil and gas leases, and numerous oil and gas wells within Siting Area E (MV-4).

Environmental Consequences

Geological Hazards

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measure 3 (Table 2-13) the impacts of geological hazards on construction of the series compensation station would be low.

Soil Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 1, 2, 3, 7 and 13 (Table 2-13) the impacts of the Project on soil resources susceptible to wind and water erosion would be mostly low with small areas of moderate impacts on areas with high water erosion susceptibility.

Mineral Resources

Following the implementation of design features of the Proposed Action (Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) the impacts on mineral resources from construction of the series compensation station would be low.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.3 Paleontological Resources

3.2.3.1 Introduction and Regulatory Framework

Paleontological resources are any fossilized remains, traces, or imprints of organisms preserved in or on the Earth's crust that are of paleontological interest and provide information about the history of life on Earth. Fossils include bones, teeth, shells, leaves, wood, and trackways buried in sedimentary deposits. Paleontological resources do not include any materials associated with an archaeological resource or any cultural item (16 U.S.C. 470aaa-4).

3.2.3.1.1 Regulatory Framework

Paleontological resources occurring on federal and state lands are afforded protection by federal and state law and regulation. Protection for paleontological resources includes requirements for: (1) the assessment of areas containing paleontological resources that could be directly or indirectly affected, damaged, or destroyed by development prior to, and as a consequence of, authorization of ground-disturbing activities; and (2) the formulation and implementation of measures (e.g., permanent preservation of the discovered sites and/or permanent preservation of salvaged materials at federal- and state-approved institutions) to mitigate potentially adverse impacts. A significant paleontological resource is "any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils" (BLM 2009b).

Federal

The FLPMA, NEPA, and the Antiquities Act of 1906 serve as the primary federal legislation providing for the protection and conservation of paleontological resources occurring on federally administered lands. FLPMA (P.L. 94-579) provides for management and mitigation of adverse impacts on federally administered land by protecting, "the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archaeological values". NEPA recognizes the continuing responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage..." (42 U.S.C. 4321 Section 101(b)(4)). The Antiquities Act of 1906 (16 U.S.C. 431-433) provides for protection of both historic and prehistoric items on federal lands.

The Omnibus Public Land Management Act – Paleontological Resource Preservation (OPLMA-PRP) codifies specific protection for paleontological resources that provide information about the history of life on earth; it contains criteria for the issuance of paleontological collection permits, directing the U.S. Secretaries of the Interior and Agriculture to ensure paleontological resources discovered on federal lands are curated properly into collections of approved repository institutions.

The Paleontological Resources Preservation Act, which codified the OPLMA-PRP, requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal Land using scientific principles and expertise (16 U.S.C. 470aaa et seq.). The Paleontological Resources Preservation Act includes specific provisions addressing management of these resources by the BLM, NPS, USBR, FWS, and the USFS.

The BLM's policy for addressing potential impacts on paleontological resources on BLM-administered lands also applies, and is included in the following documents: (1) *Paleontological Resource Management Handbook* (H-8270), (2) *General Procedural Guidance for Paleontological Resource Management* (H-8270-1), (3) *Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands* (WO Instructional Memorandum [IM] 2008-009), and (4) *Assessment and Mitigation of Potential Impacts to Paleontological Resources* (WO IM 2009-011).

State

The State of Wyoming enacted the Wyoming Antiquities Act in 1935 (Wyoming State Code §36-1-114 through §36-1-116), prohibiting:

> "…any excavation on any prehistoric ruins, pictographs, hieroglyphs or any other ancient markings, writing or archaeological and paleontological deposits on any state or federal public land in Wyoming without first obtaining a permit from the State Board of Land Commissioners."

This law also sets out the requirements for permitting from the State Board of Land Commissioners.

The State of Colorado enacted the Colorado Antiquities Act of 1873 (Colorado State Code §24-80-401 through §24-80-411), indicating that:

> "…the state of Colorado reserves to itself title to all historical, prehistorical, and archaeological resources in all lands, rivers, lakes, reservoirs, and other areas owned by the state or any county, city and county, city, town, district, or other political division of the state. Historical, prehistoric, and archaeological resources shall include all deposits, structures, or objects which provide information pertaining to the historical or prehistorical culture of people within the boundaries of the state of Colorado, as well as

> fossils and other remains of animals, plants, insects, and other objects of natural history within such boundaries."

Permits for paleontological work on Colorado state lands are issued by the State Historical Society of Colorado.

Utah State Code (§63-73-11 through §63-73-19) currently states that paleontological resources are important and requires the preservation of critical fossil resources on state lands. The Utah State Code mandates that those removing or excavating critical fossils on Utah state lands be qualified and permitted under joint jurisdictional cooperation from the Utah Geologic Survey, Utah Museum of Natural History, and SITLA. Utah State Code (§53B-17-603) also requires extracted fossils be curated by an approved and qualified institution.

3.2.3.2 Issues Identified for Analysis

General concern regarding potential impacts on paleontological resources was expressed as an issue during agency and public scoping for the Project.

Paleontological resources would be affected by ground-disturbing activities associated with Project construction, operation, and maintenance in the Project area. Potential impacts are associated with the disturbance, loss, or destruction of paleontological resources and the subsequent loss of scientific information.

3.2.3.3 Regional Setting

The Project is located in the Wyoming Basin and Middle Rocky Mountains physiographic provinces of the Rocky Mountains Division in Wyoming, Colorado, and Utah; as well as the Uinta Basin, Canyon Lands, and High Plateaus of the Colorado Plateaus Province in Utah, and the Great Basin section of the Basin and Range Province of the Intermontane Plateaus division in Colorado and Utah (Fenneman and Johnson 1946). Paleontological resources are abundant throughout the Project area, but are especially so in the Greater Green River Basin of Wyoming, the Piceance Basin of Colorado, and the Uinta Basin of Utah.

Geologic units in the Project area range in age from the Paleozoic to the Mesozoic to the Cenozoic (Table 3-33). There are 16 known fossil localities that occur in these geologic units in the study corridor (i.e., within 1 mile of the reference centerline). Some of these fossil localities are considered by the BLM, USFS, and the State of Utah to be scientifically significant because they contain vertebrate fossils and/or scientifically significant invertebrate or plant fossils.

3.2.3.3.1 Paleozoic Rocks

The Paleozoic era ranged from 541 to 252 million years ago, when much of what would become the western United States was under water. One Paleozoic geologic unit, the Madison Limestone, is exposed along the Project alternative routes in Utah and Colorado (Hintze et al. 2000; Tweto 1979). Invertebrate fossils have been recovered from the Madison Limestone.

TABLE 3-33
GEOLOGIC UNITS AND PALEONTOLOGICAL RESOURCES IN THE PROJECT AREA

Age	Geologic Unit	Lithology	PFYC[1]			Typical Fossils Associated with this Unit	Paleontological Potential
			Wyoming	Colorado	Utah		
Cenozoic Era							
Quaternary	Alluvium and colluvium	Clay, silt, sand, and gravel on flood plains, fans, and terraces	2	2	2	Rare Pleistocene fossils	Low
Quaternary	Lacustrine deposits	Clay, silt, and fine sand with minor travertine deposits	2	–	–	Rare Pleistocene fossils	Low
Quaternary	Eolian deposits	Active and dormant sand dunes	2	3	–	Rare Pleistocene fossils	Low to Moderate/Unknown
Quaternary	Gravels	Gravel and assorted alluvial material	–	3	–	Rare Pleistocene fossils	Low to Moderate/Unknown
Quaternary	Older gravels	Gravel and assorted alluvial material	–	3	–	Rare Pleistocene fossils	Low to Moderate/Unknown
Miocene	Miocene rocks	Sandstone and claystone with intermittent conglomerate	3	–	–	Mammals	Moderate/Unknown
Miocene	Browns Park Formation	Sandstone and siltstone	3	5	–	Canid, camel, pronghorn, horse	Moderate/Unknown to Very High
Oligocene	Volcanic rocks	Latite and tuff	–	–	1	–	Very Low
Oligocene	Crazy Hollow Formation	Sandstone, siltstone, and conglomerate	–	–	3	–	Moderate/Unknown
Eocene	Duchesne River Formation	Sandstone, siltstone, and mudstone	–	–	5	Significant mammalian fossil collections	Very High
Eocene	Uinta Formation	Sandstone and siltstone	–	5	5	Significant mammalian fossil collections	Very High
Eocene	Washakie Formation	Sandstone, siltstone, and claystone	5	–	–	Significant mammalian fossil collections	Very High
Eocene	Bridger Formation	Claystone and mudstone	–	5	–	Significant mammalian fossil collections	Very High
Eocene	Green River Formation	Mudstone, shale, and sandstone	5	5	4	Significant mammalian fossil collection, fish, turtles	High to Very High
Eocene	-Laney Member	Oil shale and marlstone	5	3	–	Refer to Green River Formation	Moderate/Unknown to Very High
Eocene	-Wilkins Peak Member	Mudstone, siltstone, sandstone, evaporite	5	–	–	Refer to Green River Formation	Very High
Eocene	-Parachute Creek Member	Mudstone, shale, and oil shale	–	5	–	Refer to Green River Formation	Very High
Eocene	-Tipton Shale Member	Oil shale and marlstone	5	–	–	Refer to Green River Formation	Very High
Eocene	-Luman Tongue	Oil shale, carbonaceous shale, and sandstone	5	–	–	Refer to Green River Formation	Very High

TABLE 3-33
GEOLOGIC UNITS AND PALEONTOLOGICAL RESOURCES IN THE PROJECT AREA

Age	Geologic Unit	Lithology	PFYC[1]			Typical Fossils Associated with this Unit	Paleontological Potential
			Wyoming	Colorado	Utah		
Eocene	-Lower Part	Mudstone, shale, and sandstone	–	5	–	Refer to Green River Formation	Very High
Paleocene-Eocene	Wasatch Formation	Sandstone with variegated claystone and siltstone	5	5	4	Significant mammalian fossil collections	High to Very High
Paleocene-Eocene	-Cathedral Bluffs Tongue	Claystone, mudstone, and sandstone	5	3	–	Refer to Wasatch Formation	Moderate/Unknown to Very High
Paleocene-Eocene	Flagstaff Formation	Limestone and mudstone	–	–	4	Mammal	High
Paleocene	Hanna Formation	Sandstone, shale, and conglomerate	5	–	–	Significant mammalian fossil collections	Very High
Paleocene	Fort Union Formation	Sandstone, shale, and thin coal beds	3	3	–	Significant mammalian fossil collections	Moderate/Unknown
Cretaceous-Paleocene	North Horn Formation	Sandstone, siltstone, and limestone	–	–	4	Turtle, lizard, pterosaur, dinosaur, mammal	High
Mesozoic Era							
Cretaceous-Paleocene	Ferris Formation	Sandstone and shale	5	–	–	Shark, bony fish, turtle, crocodile, dinosaur	Very High
Cretaceous	Lance Formation	Sandstone with shale and conglomerate lenses	5	–	–	Dinosaur	Very High
Cretaceous	Laramie Formation	Shale, claystone, sandstone and major coal beds	–	3	–	Dinosaur	Moderate/Unknown
Cretaceous	Medicine Bow Formation	Sandstone, shale, and coal	3	–	–	–	Moderate/Unknown
Cretaceous	Lewis Shale	Marine shale with sandstone beds	3	3	–	Ammonite	Moderate/Unknown
Cretaceous	Mesaverde Group	Sandstone, shale, and coal beds	3	–	4	Ammonite, dinosaur	Moderate/Unknown to High
Cretaceous	Williams Fork Formation	Sandstone, shale, and major coal beds	–	5	–	Dinosaur	Very High
Cretaceous	Iles Formation	Sandstone, shale, and coal	–	5	–	Ammonites, bivalves	Very High
Cretaceous	Hunter Canyon Formation	Sandstone and shale	–	3	–	–	Moderate/Unknown
Cretaceous	Price River Formation	Sandstone, siltstone, and conglomerate	–	–	4	Dinosaur trackways	High
Cretaceous	Indianola Formation	Sandstone, siltstone, and conglomerate	–	–	3	–	Moderate/Unknown

TABLE 3-33
GEOLOGIC UNITS AND PALEONTOLOGICAL RESOURCES IN THE PROJECT AREA

Age	Geologic Unit	Lithology	PFYC[1]			Typical Fossils Associated with this Unit	Paleontological Potential
			Wyoming	Colorado	Utah		
Cretaceous	Mancos Shale	Shale and sandstone	–	3	3	Plant fragment, trace fossil, ammonite, shark teeth, mosasaur	Moderate/Unknown
Lower Cretaceous	Mt. Garfield Formation and Sego Sandstone	Sandstone, shale, coal	–	3	–	–	Moderate/Unknown
Lower Cretaceous	Sego Sandstone, Buck Tongue, and Castlegate Sandstone	Sandstone and shale	–	3	–	–	Moderate/Unknown
Cretaceous	Steele Shale	Marine shale with bentonite	3	–	–	–	Moderate/Unknown
Cretaceous	Niobrara Formation	Limestone and shale	5	–	–	Fish, mosasaur, plesiosaur	Very High
Cretaceous	Dakota Sandstone, Burro Canyon, Cedar Mountain Formations	Sandstone, shale, and conglomerate	–	5	5	Fossil leaves, dinosaur	High to Very High
Jurassic	Morrison Formation	Mudstone, sandstone, and limestone	–	5	5	Petrified wood, bivalve, crocodile, dinosaur	Very High
Jurassic	Arapien Shale	Shale	–	–	3	–	Moderate/Unknown
Jurassic	Summerville Formation.	Shale and siltstone	–	–	3	Dinosaur, trace fossils	Moderate/Unknown
Jurassic	Entrada Formation	Sandstone	–	–	2	Dinosaur trackways	Low
Jurassic	Carmel Formation	Shale	–	–	2	Bivalves, trackways	Low
Jurassic	Glen Canyon Group	Sandstone	–	–	3	Dinosaur trackways and fossils	Moderate/Unknown
Triassic	Ankareh Shale	Shale	–	–	3	–	Moderate/Unknown
Paleozoic Era							
Mississippian	Madison Limestone	Limestone	–	3	–	Invertebrate fossils	Moderate/Unknown

SOURCES: Green 1992; Green and Drouilard 1994; Gunnell and Bartels 1999; Hamblin and Bilbey 1999; Higgins 2003; Hintze et al. 2000; Honey and Izett 1988; Kass 1999; Kirkland et al. 1999; Rasmussen et al. 1999a; Rasmussen et al. 1999b; Robinson et al. 2004; University of California-Santa Barbara 2012
NOTE: [1]Potential fossil yield classification (PFYC) numbers represent class levels of potential (1 = very low, 2 = low, 3 = moderate or unknown, 4 = high, 5 = very high). For more explanation, refer to Section 3.2.3.4.

3.2.3.3.2 Mesozoic Rocks

The Mesozoic era ranged from 252 to 66 million years ago. Mesozoic geologic units along the Project alternative routes were deposited in a wide variety of paleoenvironments, including shallow seas, rivers, estuaries, and deserts. These geologic units have produced a wide variety of fossils, such as dinosaurs (tyrannosaur, ornithomimid, dromaeosaur, ceratopsian, ankylosaur, and hadrosaur), fish (cartilaginous and bony), turtles, crocodiles, birds, and mammals.

3.2.3.3.3 Cenozoic Rocks

The Cenozoic era ranges from 66 million years ago to the present. Several formations of Cenozoic age occur along the Project alternative routes that were deposited in a wide variety of paleoenvironments, including huge basin lake systems, rivers, and streams. These geologic units have produced some of the world's most extensive collections of Cenozoic fossils, including mammals (multituberculates, rodents, primates, carnivores, perissodactyls, and artiodactyls), fish, turtles, crocodiles, and birds.

3.2.3.4 Study Methodology

3.2.3.4.1 Inventory

Information for the paleontological inventory was obtained from a review of the scientific literature and geologic maps and from record searches at paleontological institutions and governmental agencies. Agencies and institutions contacted include the USGS, BLM, Utah Geological Survey, University of Wyoming Department of Geology and Geophysics, University of Colorado Museum of Natural History, and the Paleobiology Database maintained by the University of California at Santa Barbara. Fieldwork was not conducted as part of this inventory.

Information about the geological units and known fossil localities in the region were used to identify the paleontological potential of areas within 1 mile of the centerline. Paleontological potential levels were assigned to each geological unit using the PFYC system adopted by the BLM in 2007 for assessing paleontological potential on federal land (BLM 2008g). The PFYC system is a five-tiered system that classifies geological units based on the relative abundance of vertebrate fossil or scientifically significant invertebrate and plant fossils and their potential to be adversely affected, with a higher class number indicating a higher potential level. This classification system is applied to the geologic formation, member, or other distinguishable map unit, preferably at the most detailed level possible, because of the direct relationship that exists between paleontological resources and the geologic units in which fossils are entombed. By knowing the geology of a particular area and the fossil productivity of particular geologic units, it is possible to predict where fossils likely would be found. Each class is defined as follows (WO IM 2008-2009):

Class 1 – Very Low. Geologic units that are not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units.
- Units that are Precambrian in age or older.

(1) Management concern for paleontological resources in Class 1 units is usually negligible or not applicable.
(2) Assessment or mitigation is usually unnecessary except in very rare or isolated circumstances.

The probability for impacting any fossils is negligible. Assessment or mitigation of paleontological resources is usually unnecessary. The occurrence of significant fossils is non-existent or extremely rare.

Class 2 – Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare.
- Units that are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).

(1) Management concern for paleontological resources is generally low.
(2) Assessment or mitigation is usually unnecessary except in rare or isolated circumstances.

The probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Assessment or mitigation of paleontological resources is not likely to be necessary. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.

Class 3 – Moderate or **Unknown**. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

- Often marine in origin with sporadic known occurrences of vertebrate fossils.
- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low.

(or)

- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.

Class 3a – Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – Unknown Potential. Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.

(1) Management concern for paleontological resources is moderate; or cannot be determined from existing data.
(2) Surface-disturbing activities may require field assessment to determine appropriate course of action.

This classification includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units of moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options as well, and could include pre-disturbance surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources. These units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.

Class 4 – High. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

Class 4a. Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may affect some areas.

Class 4b. These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts on the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than two contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

(1) Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action.
(2) A field survey by a qualified paleontologist is often needed to assess local conditions.
(3) Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered.
(4) Class 4 and Class 5 units may be combined as Class 5 for broad applications, such as planning efforts or preliminary assessments, when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations are similar at this level of analysis, and impacts and alternative routes can be addressed at a level appropriate to the application.

The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access resulting in greater looting potential. If impacts on significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.

Class 5 – Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Class 5a. Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Class 5b. These are areas underlain by geologic units with very high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts on the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
- Areas of exposed outcrop are smaller than two contiguous acres.
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

(1) Management concern for paleontological resources in Class 5 areas is high to very high.
(2) A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities or land tenure adjustments. Mitigation will often be necessary before and/or during these actions.
(3) Official designation of areas of avoidance, special interest, and concern may be appropriate.

The probability for impacting significant fossils is high. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

3.2.3.4.2 Impact Assessment and Mitigation Planning

The methodology for assessing the potential impacts on paleontological resources associated with implementing the Project includes: (1) identifying the types of potential effects on paleontological resources that could result from the construction, operation, and maintenance of the proposed transmission line and associated facilities; (2) developing criteria for assessing the intensity of potential effects on paleontological resources based on the relative sensitivity of paleontological resources associated with each geologic unit that could be affected by the Project; and (3) using the resource sensitivity level assigned to a geologic unit as an indication of the intensity of impacts on paleontological resources associated with implementation of the Project.

Types of Potential Environmental Effects

The construction, operation, and maintenance of the Project could result in both direct and indirect adverse effects on paleontological resources. Potential direct effects associated with construction activities could include the loss of paleontological resources as a result of ground-disturbing activities such as excavation, blasting, and construction of facilities, staging areas, and road construction or road

improvement. Potential direct effects associated with the operation and maintenance of the facilities and the presence of the transmission line are not anticipated.

Indirect effects associated with the construction, operation, and maintenance of the Project could include loss of paleontological resources resulting from increases in the following:

- Access of the general public to sensitive geologic formations and unauthorized collection or vandalism from the construction of permanent access roads
- Erosion associated with construction activities that exposes new fossils

Mitigation Planning and Effectiveness

The loss of paleontological resources due to construction and ground-disturbing activities resulting from implementation of the Project would be the primary potential adverse environmental effect. As a design feature of the Proposed Action (Table 2-8), a Paleontological Resources Treatment Plan (PRTP) would be developed in consultation with the appropriate land-management agencies to mitigate potential adverse impacts on paleontological resources. The PRTP would include requirements for: (1) a preconstruction survey to describe and collect paleontological resources (found on the surface), (2) monitoring of ground-disturbing activities during construction to collect paleontological resources found below the surface, (3) curation of any fossils collected during the survey or monitoring, and (4) deposition of the paleontological resources into a federally approved repository for future scientific study and education. Without preparation and implementation of a PRTP, impacts on paleontological resources would be high along these routes, as many areas would contain paleontological resources.

Criteria for Assessing Intensity of Impacts

Criteria for assessing the relative sensitivity of paleontological resources associated with each geologic unit that could be affected by the Project include PFYC and density of recorded fossil localities. Literature research, institutional record searches, and PFYC provided the information necessary to assign a sensitivity moderate/unknown to portions of the study corridors. Mitigation of potentially adverse impacts on scientifically significant paleontological resources exposed during construction-related activities would be based on the determination of sensitivity level and implementation of prescribed treatments where sensitivities are determined to be high or moderate, or during other specific cases (e.g., chance discoveries of paleontological resources in areas with low sensitivity). For the analysis, sensitivity levels were defined as follows:

High Sensitivity Level. The geologic unit has a high potential for containing significant paleontological resources. In these cases, the geologic unit contains a high density of recorded fossil localities, has produced fossil remains in or near the vicinity of the Project, or is very likely to yield additional remains during construction. Areas identified as having a PFYC of 4 or 5 were considered to have a high sensitivity level.

Moderate/unknown Sensitivity Level. The geologic unit has limited exposure in the Project area, is poorly studied, or contains no recorded paleontological resource localities. However, in other areas, the same or similar geologic units may contain sufficient paleontological localities to suggest that exposures of the unit in the Project area would have at least a moderate potential for yielding fossil remains. Areas with a PFYC of 3 were considered to have a moderate or undetermined sensitivity level.

Low Sensitivity Level. The geologic unit contains very low or no density of recorded fossil localities, has produced little or no fossil remains in the vicinity of the Project, or is not likely to yield any fossil remains. Nevertheless, geologic units with few or no prior recorded fossil localities could prove

fossiliferous during construction. Areas identified as having a PFYC of 1 or 2 were considered to have a low sensitivity level.

Effects Analysis

The resource sensitivity level assigned to a geologic unit was used to indicate the intensity of impacts on paleontological resources associated with implementation of the Project.

3.2.3.5 Results

3.2.3.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.3.5.2 Impacts Common to All Action Alternatives

There are no impacts on paleontological resources that would be anticipated to be common to all action alternative routes.

3.2.3.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary components are within the Quaternary Alluvium, a geologic unit with a low sensitivity level for paleontological resources.

3.2.3.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B and associated route variations in Wyoming cross 18 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary lacustrine deposits, Quaternary eolian deposits, and Quaternary gravels have a low PFYC (Table 3-33). The Miocene rocks, Laney and Tipton Shale members of the Green River Formation, Fort Union Formation, Medicine Bow Formation, and Steele Shale have a moderate/unknown PFYC. The Washakie Formation, Wasatch Formation, Hanna Formation, Ferris Formation, Lance Formation, Mesaverde Group, and Niobrara Formation have a high PFYC. There are 1.9 miles of high locality density and 0.3 mile of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34). There are 97.4 miles of high sensitivity and 88.9 miles of moderate sensitivity.

Environmental Consequences (Wyoming)

Alternative WYCO-B

Alternative WYCO-B in Wyoming crosses 54.5 miles of high, 15.8 miles of moderate, and 7.6 miles of low sensitivity for paleontological resources on BLM-administered land; 1.9 miles of high, 1.2 mile of moderate, and 0.8 mile of low sensitivity on state land; and 29.9 miles of high, 21.0 miles of moderate, and 5.3 miles of low sensitivity on private land; (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3, 4, or 5) would be surveyed prior to construction to support development of the PRTP to be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on

paleontological resources associated with this alternative route. Thus, impacts on paleontological resources associated with implementation of the Project along with alternative route would be low.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

In Wyoming, Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 would have similar impacts on paleontological resources as Alternative WYCO-B with slight variations in the miles of sensitivity (Table 3-34).

Affected Environment (Colorado)

Alternative WYCO-B and associated route variations in Colorado cross 9 geologic units. Of these geologic units, Quaternary alluvium and colluvium and older Quaternary gravels have a low PFYC (Table 3-33). The Laney Member of the Green River Formation, Cathedral Bluffs Tongue, Mancos Shale, and the Sego Sandstone and Buck Tongue members of the Mancos Shale have a moderate/unknown PFYC. The Browns Park Formation, Bridger Formation, Williams Fork Formation, Wasatch Formation, and Iles Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Colorado)

Alternative WYCO-B

Alternative WYCO-B in Colorado crosses 15.3 miles of high, 31.3 miles of moderate, and 1.3 miles of low sensitivity for paleontological resources on BLM-administered land; 1 mile of high, 8.9 miles of moderate, and 0.9 mile of low sensitivity on state land; and 4.7 miles of high, 2.3 miles of moderate, and 0.7 mile of low sensitivity on private land (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or moderate/unknown sensitivity (i.e., PFYC 3, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

In Colorado, Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-B with minor variations in the extent of the areas with high or moderate sensitivity (Table 3-34).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C and associated route variations in Wyoming cross 18 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary lacustrine deposits, Quaternary eolian deposits, and Quaternary gravels have a low PFYC (Table 3-33). The Miocene rocks, Laney and Tipton members of the Green River Formation, Fort Union Formation, Medicine Bow Formation, and Steele Shale have a moderate/unknown PFYC. The Washakie Formation, Wasatch Formation, Hanna Formation, Ferris Formation, Lance Formation, Mesaverde Group, and Niobrara Formation have a high PFYC. There are 1.9 miles of high locality density and 0.3 mile of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Wyoming)

Alternative WYCO-C

Alternative WYCO-C in Wyoming crosses 57.6 miles of high, 15.8 miles of moderate, and 6.0 miles of low sensitivity for paleontological resources on BLM-administered land; 2.4 miles of high, 1.2 mile of moderate, and 0.6 mile of low sensitivity on state land; 32.7 miles of high, 21.0 miles of moderate, and 6.6 miles of low sensitivity on private land; and 0.1 mile of low sensitivity on other land jurisdictions (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

In Wyoming, Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-B with minor variations in the extent of the areas with high or moderate sensitivity (Table 3-34).

Affected Environment (Colorado)

Alternative WYCO-C and associated route variations in Colorado cross nine geologic units. Of these geologic units, Quaternary alluvium and colluvium and older Quaternary gravels have a low PFYC (Table 3-33). The Laney and Wilkins Peak members of the Green River Formation, Cathedral Bluffs Tongue of the Wasatch Formation, Mancos Shale, and the Sego Sandstone and Buck Tongue members of the Mancos Shale have a moderate/unknown PFYC. The Browns Park Formation, Bridger Formation, Williams Fork Formation, and Iles Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Colorado)

Alternative WYCO-C

Alternative WYCO-C in Colorado crosses 15.1 miles of high, 31.1 miles of moderate, and 1.3 miles of low sensitivity for paleontological resources on BLM-administered land; 1.0 mile of high, 8.9 miles of moderate, and 0.9 mile of low sensitivity on state land; and 5.1 miles of high, 2.3 miles of moderate, and 0.7 mile of low sensitivity on private land (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with very high, high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

In Colorado, Route Variations WYCO-C-1, WYCO-C-2, WYCO-C-3 would have similar impacts on paleontological resources as Alternative WYCO-B with minor variations in the extent of the areas with high or moderate sensitivity (Table 3-34).

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming cross 14 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary lacustrine deposits, and Quaternary gravels have a low PFYC (Table 3-33). The Miocene rocks, Fort Union Formation, Medicine Bow Formation, Lewis Shale, and Steele Shale have a moderate/unknown PFYC. The Wasatch Formation, Hanna Formation, Ferris Formation, Lance Formation, and Niobrara Formation have a high PFYC. There are 1.3 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Wyoming)

Alternative WYCO-D

Alternative WYCO-D in Wyoming crosses 37 miles of high, 23.3 miles of moderate, and 6.8 miles of low sensitivity for paleontological resources on BLM-administered land; 3.7 miles of high, 1.6 mile of moderate, and 1.1 miles of low sensitivity on state land; 28.5 miles of high, 26.3 miles of moderate, and 6.6 miles of low sensitivity on private land; and 0.2 mile of low sensitivity on other land jurisdictions (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with very high, high, or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-D Route Variation (WYCO-D-1)

In Wyoming, Route Variation WYCO-D-1 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-D with minor variations in the areas with high or moderate sensitivity (Table 3-34).

Affected Environment (Colorado)

Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado cross 11 geologic units. Of these geologic units, Quaternary alluvium and colluvium and Quaternary eolian deposits have a low PFYC (Table 3-33). The Fort Union Formation, Laramie Formation, Lewis Shale, and Mancos Shale have a moderate/unknown PFYC. The Browns Park Formation, Wasatch Formation, Williams Fork Formation, and Iles Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Colorado)

Alternative WYCO-D

Alternative WYCO-D in Colorado crosses 22.0 miles of high, 15.5 miles of moderate, and 1.2 miles of low sensitivity for paleontological resources on BLM-administered land; 12.2 miles of high, 4.3 miles of moderate, and 2.4 miles of low sensitivity on state land; 3.7 miles of high on local lands, and 25.4 miles of high, 25.0 miles of moderate, and 3.3 miles of low sensitivity on private land (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with very high, high, or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-D Route Variation (WYCO-D-1)

In Colorado, Route Variation WYCO-D-1 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-D with minor variations in the areas with high or moderate sensitivity (Table 3-34).

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F and associated route variations in Wyoming cross 17 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary lacustrine deposits, and Quaternary gravels have a low PFYC (Table 3-33). The Miocene rocks, Tipton and Luman Tongue members of the Green River Formation, Fort Union Formation, Medicine Bow Formation, Lewis Shale, and Steele Shale have a moderate/unknown PFYC. The Wasatch Formation, Hanna Formation, Ferris Formation, Lance Formation, Mesaverde Group, and Niobrara Formation have a high PFYC. There are 1.9 miles of high locality density and 0.3 mile of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Wyoming)

Alternative WYCO-F

Alternative WYCO-F in Wyoming crosses 70.7 miles of high, 15.8 miles of moderate, and 6.3 miles of low sensitivity for paleontological resources on BLM-administered land; 2.3 miles of high, 1.2 miles of moderate, and 0.6 mile of low sensitivity on state land; 29.2 miles of high, 21 miles of moderate, and 5.3 miles of low sensitivity on private land; and 0.3 mile of moderate sensitivity and 0.1 mile of low sensitivity on other land jurisdictions (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with very high, high, or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

In Wyoming, Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-F but with minor variations in the areas with high and moderate sensitivity (Table 3-34).

Affected Environment (Colorado)

Alternative WYCO-F and associated route variations in Colorado cross nine geologic units. Of these geologic units, Quaternary alluvium and colluvium and older Quaternary gravels have a low PFYC (Table 3-33). The Laney Member of the Green River Formation, Cathedral Bluffs Tongue of the Wasatch Formation, and the Mancos Shale have a moderate/unknown PFYC. The Browns Park Formation, Bridger Formation, and Williams Fork Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-34).

Environmental Consequences (Colorado)

Alternative WYCO-F

Alternative WYCO-F in Colorado crosses 15.3 miles of high, 31.3 miles of moderate, and 1.3 miles of low sensitivity for paleontological resources on BLM-administered land; 1.0 mile of high, 8.9 miles of

moderate, and 0.9 mile of low sensitivity on state land; and 5.1 miles of high, 2.3 miles of moderate, and 0.7 mile of low sensitivity on private land (Table 3-34 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with very high, high, or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

In Colorado, Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 would be anticipated to have similar impacts on paleontological resources as Alternative WYCO-F with minor variations in the areas with high or moderate sensitivity (Table 3-34).

TABLE 3-34
COMPARISON OF PALEONTOLOGICAL SENSITIVITY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Sensitivity[1] (miles)			Known Fossil Locality Density[2] (miles)		
		Low	Moderate/ Unknown	High	Low	Moderate	High
Alternative WYCO-B and Route Variations							
WYCO-B (Applicant Preferred Alternative)	204.5	16.7	80.5	107.3	202.0	0.6	1.9
Wyoming	*138.1*	*13.8*	*38.0*	*86.3*	*135.6*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.5*	*21.0*	*66.4*	*0.0*	*0.0*
WYCO-B-1	204.9	16.4	81.2	107.3	202.4	0.6	1.9
Wyoming	*138.1*	*13.8*	*38.0*	*86.3*	*135.6*	*0.6*	*1.9*
Colorado	*66.8*	*2.6*	*43.2*	*21.0*	*66.8*	*0.0*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	16.7	80.0	107.8	202.0	0.6	1.9
Wyoming	*138.1*	*13.8*	*38.0*	*86.3*	*135.6*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.0*	*21.5*	*66.4*	*0.0*	*0.0*
WYCO-B-3	204.5	16.7	80.3	107.5	202.0	0.6	1.9
Wyoming	*138.1*	*13.8*	*38.0*	*86.3*	*135.6*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.3*	*21.2*	*66.4*	*0.0*	*0.0*
Alternative WYCO-C and Route Variations							
WYCO-C	210.4	16.2	80.3	113.9	207.9	0.6	1.9
Wyoming	*144.0*	*13.3*	*38.0*	*92.7*	*141.5*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.3*	*21.2*	*66.4*	*0.0*	*0.0*
WYCO-C-1	210.8	15.9	81.2	113.7	208.3	0.6	1.9
Wyoming	*144*	*13.3*	*38.0*	*92.7*	*141.5*	*0.6*	*1.9*
Colorado	*66.8*	*2.6*	*43.2*	*21*	*66.8*	*0.0*	*0.0*
WYCO-C-2	210.4	16.2	80.0	114.2	207.9	0.6	1.9
Wyoming	*144.0*	13.3	38.0	92.7	141.5	0.6	1.9
Colorado	*66.4*	2.9	42.0	21.5	66.4	0.0	0.0
WYCO-C-3	210.4	16.2	80.3	113.9	207.9	0.6	1.9
Wyoming	*144*	13.3	38.0	92.7	141.5	0.6	1.9
Colorado	*66.4*	2.9	42.3	21.2	66.4	0.0	0.0

TABLE 3-34
COMPARISON OF PALEONTOLOGICAL SENSITIVITY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Sensitivity[1] (miles)			Known Fossil Locality Density[2] (miles)		
		Low	Moderate/ Unknown	High	Low	Moderate	High
Alternative WYCO-D and Route Variation							
WYCO-D	250.0	21.5	96.0	132.5	248.8	1.2	0.0
Wyoming	*135.0*	*14.6*	*51.2*	*69.2*	*133.8*	*1.2*	*0.0*
Colorado	*115.0*	*6.9*	*44.8*	*63.3*	*115.0*	*0.0*	*0.0*
WYCO-D-1	250.0	21.5	96.0	132.5	248.8	1.2	0.0
Wyoming	*135*	*14.6*	*51.2*	*69.2*	*133.8*	*1.2*	*0.0*
Colorado	*115*	*6.9*	*44.8*	*63.3*	*115.0*	*0.0*	*0.0*
Alternative WYCO-F and Route Variations							
WYCO-F	218.9	15.2	80.5	123.2	216.4	0.6	1.9
Wyoming	*152.5*	*12.3*	*38*	*102.2*	*150.0*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.5*	*21.0*	*66.4*	*0.0*	*0.0*
WYCO-F-1	219.3	14.9	81.2	123.2	216.8	0.6	1.9
Wyoming	*152.5*	*12.3*	*38.0*	*102.2*	*150*	*0.6*	*1.9*
Colorado	*66.8*	*2.6*	*43.2*	*21.0*	*66.8*	*0.0*	*0.0*
WYCO-F-2	218.9	15.2	80.0	123.7	216.4	0.6	1.9
Wyoming	*152.5*	*12.3*	*38.0*	*102.2*	*150*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.0*	*21.5*	*66.4*	*0.0*	*0.0*
WYCO-F-3	218.9	15.2	80.3	123.4	216.4	0.6	1.9
Wyoming	*152.5*	*12.3*	*38.0*	*102.2*	*150.0*	*0.6*	*1.9*
Colorado	*66.4*	*2.9*	*42.3*	*21.2*	*66.4*	*0.0*	*0.0*

NOTES:
[1]Sensitivity: Low = PFYC 1 and 2, Moderate/Unknown = PFYC 3, and High = PFYC 4 and 5
[2]Known fossil localities: Low = 0 to 5 localities/square mile, Moderate = 6 to 15 localities/square mile, and High = greater than 15 localities/square mile
PFYC = Potential fossil yield classification

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado crosses 12 geologic units. Of these geologic units, Quaternary alluvium and colluvium has a low PFYC (Table 3-33). The Lower Part of the Green River Formation, Hunter Canyon Formation, Mancos Shale, Mt. Garfield Formation and Sego Sandstone, the Sego and Castlegate sandstones, and the Sego Sandstone have a moderate/unknown PFYC. The Wasatch Formation, Williams Fork Formation, Iles Formation, and the Dakota Sandstone and Burro Canyon formations have a high PFYC. There are 2.3 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-33).

Environmental Consequences (Colorado)

Alternative COUT BAX-B in Colorado crosses 46.5 miles of high, 15.4 miles of moderate, and 7.5 miles of low sensitivity for paleontological resources on BLM-administered land; and 8.9 miles of high, 8.3 miles of moderate, and 0.1 mile of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be

implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT BAX-B in Utah crosses 21 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary eolian deposits, older Quaternary gravels, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The Crazy Hollow Formation; North Horn Formation; Indianola Formation; Mancos Shale; Arapien Shale; Summerville, Entrada, and Carmel formations; and the Glen Canyon Group have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Flagstaff Formation, Mesaverde Group, Dakota Sandstone and Cedar Mountain formations, and the Morrison Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-35).

Environmental Consequences (Utah)

Alternative COUT BAX-B in Utah crosses 6.6 miles of high, 68.1 miles of moderate, and 28.6 miles of low sensitivity for paleontological resources on BLM-administered land; 12.9 miles of high, 0.3 mile of moderate, and 3.7 miles of low sensitivity on USFS-administered land; 5.4 miles of high, 19.5 miles of moderate, and 6 miles of low sensitivity on state land; and 8.5 miles of high, 10.9 miles of moderate, and 22.0 miles of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or moderate/unknown sensitivity (i.e., PFYC 3, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT BAX-C

Affected Environment (Colorado)

Alternative COUT BAX-C in Colorado crosses the same geologic formations as Alternative COUT BAX-B in Colorado. Like Alternative COUT BAX-B, there are 2.3 miles of moderate locality density within 1 mile of the reference centerline (Table 3-35).

Environmental Consequences (Colorado)

Alternative COUT BAX-C in Colorado crosses 46.5 miles of high, 15.4 miles of moderate, and 7.5 miles of low sensitivity for paleontological resources on BLM-administered land; and 8.9 miles of high, 8.3 miles of moderate, and 0.1 mile of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah crosses the same geologic formations as Alternative COUT BAX-B in Utah. Like Alternative COUT BAX-B, there are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-35).

Environmental Consequences (Utah)

Alternative COUT BAX-C in Utah crosses 10.2 miles of high, 69.2 miles of moderate, and 30.5 miles of low sensitivity for paleontological resources on BLM-administered land; 12.9 miles of high, 0.3 mile of moderate, and 3.7 miles of low sensitivity on USFS-administered land; 3.1 miles of high, 26.3 miles of moderate, and 5.4 miles of low sensitivity on state land; and 8.5 miles of high, 10.9 miles of moderate, and 22.0 miles of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT BAX-E

Affected Environment (Colorado)

Alternative COUT BAX-E in Colorado crosses the same geologic formation as Alternative COUT BAX-B in Colorado. Like Alternative COUT BAX-B, there are 2.3 miles of moderate locality density within 1 mile of the reference centerline (Table 3-35).

Environmental Consequences (Colorado)

Alternative COUT BAX-E in Colorado crosses 46.5 miles of high, 15.4 miles of moderate, and 7.5 miles of low sensitivity for paleontological resources on BLM-administered land; and 8.9 miles of high, 8.3 miles of moderate, and 0.1 mile of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah crosses 16 geologic units. Of these geologic units, Quaternary alluvium and colluvium, Quaternary eolian deposits, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The North Horn Formation, Indianola Formation, Mancos Shale, and Arapien Shale have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Green River Formation, Flagstaff Formation, Mesaverde Group, Dakota Sandstone and Cedar Mountain formations, and Morrison Formation have a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-35).

Environmental Consequences (Utah)

Alternative COUT BAX-E in Utah crosses 9.0 miles of high, 79.7 miles of moderate, and 32.9 miles of low sensitivity for paleontological resources on BLM-administered land; 7.7 miles of high sensitivity on USFS-administered land; 1.1 miles of high, 20.4 miles of moderate, and 5.6 miles of low sensitivity on state land; and 17.2 miles of high, 13.5 miles of moderate, and 17.7 miles of low sensitivity on private land (Table 3-35 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP to be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

TABLE 3-35
COMPARISON OF PALEONTOLOGICAL SENSITIVITY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Sensitivity[1] (miles)			Known Fossil Locality Density[2] (miles)		
		Low	Moderate/ Unknown	High	Low	Moderate	High
COUT BAX-B	279.2	67.9	122.5	88.8	276.9	2.3	0.0
Colorado	*86.7*	*7.6*	*23.7*	*55.4*	*84.4*	*2.3*	*0.0*
Utah	*192.5*	*60.3*	*98.8*	*33.4*	*192.5*	*0.0*	*0.0*
COUT BAX-C	289.7	69.2	130.4	90.1	287.4	2.3	0.0
Colorado	*86.7*	*7.6*	*23.7*	*55.4*	*84.4*	*2.3*	*0.0*
Utah	*203.0*	*61.6*	*106.7*	*34.7*	*203.0*	*0.0*	*0.0*
COUT BAX-E	291.5	63.8	137.3	90.4	289.2	2.3	0.0
Colorado	*86.7*	*7.6*	*23.7*	*55.4*	*84.4*	*2.3*	*0.0*
Utah	*204.8*	*56.2*	*113.6*	*35.0*	*204.8*	*0.0*	*0.0*

NOTES:
[1]Sensitivity: Low = PFYC 1 and 2, Moderate/Unknown = PFYC 3, and High = PFYC 4 and 5
[2]Known fossil localities: Low = 0 to 5 localities/square mile, Moderate = 6 to 15 localities/square mile, and High = greater than 15 localities/square mile
PFYC = Potential fossil yield classification

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A and Route Variation COUT-A-1 in Colorado crosses three geologic units. Of these geologic units, the Mancos Shale and the Sego and Castlegate sandstones have a moderate/unknown PFYC (Table 3-33). The Mesaverde Group has a high PFYC. There are no areas of high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Colorado)

Alternative COUT-A and Route Variation COUT-A-1 in Colorado cross 12.8 miles of high and 3.4 miles of moderate sensitivity for paleontological resources on BLM-administered land; 3.1 miles of high and 1.0 mile of moderate sensitivity on state land; and 2.4 miles of high and 1.3 miles of moderate sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT-A and Route Variation COUT-A-1 in Utah cross 14 geologic units. Of these geologic units, Quaternary alluvium and colluvium, older Quaternary alluvium, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The North Horn Formation, Indianola Formation, Arapien Shale, and Ankareh Shale have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Green River Formation, Wasatch Formation, Flagstaff Formation, and Price River Formation have a high PFYC. There are 1.5 miles of high locality density and 2.6 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Utah)

Alternative COUT-A

Alternative COUT-A in Utah crosses 26.4 miles of high, 0.2 mile of moderate, and 12.6 miles of low sensitivity for paleontological resources on BLM-administered land; 19.0 miles of high and 1.0 mile of low sensitivity on USFS-administered land; 10.9 miles of high, 2.1 miles of moderate, and 7.7 miles of low sensitivity on state land; and 52.0 miles of high, 5.6 miles of moderate, and 44.5 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT-A Route Variation (COUT-A-1)

In Utah, Route Variation COUT-A-1 would be anticipated to have similar impacts on paleontological resources as Alternative COUT-A with minor variations in the areas with high or moderate sensitivity (Table 3-36).

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

Alternative COUT-B and associated route variations in Colorado cross the same geologic formations as Alternative COUT-A in Colorado. Like Alternative COUT-A, there are no areas with high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Colorado)

In Colorado, Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 would be anticipated to have similar impacts on paleontological resources as Alternative COUT-A with minor variations in the areas with high or moderate sensitivity (Table 3-36).

Affected Environment (Utah)

Alternative COUT-B and associated route variations in Utah cross the same geologic units as COUT-A.

Environmental Consequences (Utah)

Alternative COUT-B

Alternative COUT-B in Utah crosses 27.2 miles of high, 0.2 mile of moderate, and 12.6 miles of low sensitivity for paleontological resources on BLM-administered land; 18.1 miles of high and 1.0 mile of low sensitivity on USFS-administered land; 12.9 miles of high, 2.1 miles of moderate, and 7.3 miles of low sensitivity on state land; 4.8 miles of high and 3.0 miles of low sensitivity on tribal land; and 63.5 miles of high, 5.6 miles of moderate, and 33.7 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP to be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Route Variation COUT-B-1 in Utah crosses 32.6 miles of high, 0.2 mile of moderate, and 12.6 miles of low sensitivity for paleontological resources on BLM-administered land; 19.9 miles of high and 1 mile of low sensitivity on USFS-administered land; 9.5 miles of high, 2.1 miles of moderate, and 7.5 miles of low sensitivity on state land; 4.8 miles of high and 3.0 miles of low sensitivity on tribal land; and 55.2 miles of high, 5.6 miles of moderate, and 34.7 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP to be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Route Variations COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 would be anticipated to have similar impacts on paleontological resources as Route Variation COUT-B-1 with minor variations in the areas with high or moderate sensitivity (Table 3-36).

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative] COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C and associated route variations in Colorado cross the same geologic units as Alternative COUT-A. Like Alternative COUT-A, there are no areas with high or moderate locality density within 1 mile of the reference centerline for these alternative routes (Table 3-36).

Environmental Consequences (Colorado)

Alternative COUT-C

Alternative COUT-C in Colorado crosses 14.1 miles of high and 4.0 miles of moderate sensitivity for paleontological resources on BLM-administered land; 2.8 miles of high and 1.0 mile of moderate sensitivity on state land; and 0.5 mile of high and 2.4 miles of moderate sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 would be anticipated to have similar impacts on paleontological resources as Alternative COUT-C with minor variations in the extent of the areas with high or moderate sensitivity (Table 3-36).

Affected Environment (Utah)

Alternative COUT-C and associated route variations in Utah cross 15 geologic units. Of these geologic units, the Quaternary alluvium and colluvium, older Quaternary alluvium, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The North Horn Formation, Indianola Formation, Arapien Shale, and Ankareh Shale have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Green River Formation, Wasatch Formation, Flagstaff Formation, Mesaverde Group, and the Price River

Formation have a high PFYC. There are 1.6 miles of high locality density and 14.0 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Utah)

Alternative COUT-C

Alternative COUT-C in Utah crosses 62.7 miles of high, 0.2 mile of moderate, and 10.2 miles of low sensitivity for paleontological resources on BLM-administered land; 8.2 miles of high and 1.0 mile of low sensitivity on USFS-administered land; 18.5 miles of high, 2.1 miles of moderate, and 6.7 miles of low sensitivity on state land; 2.3 miles of high and 0.4 mile of low sensitivity on tribal land; and 48.9 miles of high, 5.6 miles of moderate, and 18.2 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

In Utah, Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 would be anticipated to have similar impacts on paleontological resources as Alternative COUT-C with minor variations in the areas with high and moderate sensitivity (Table 3-36).

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment (Colorado)

Alternative COUT-H in Colorado crosses the same geologic units as Alternative COUT-A. Like Alternative COUT-A, there are no areas with high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Colorado)

Alternative COUT-H in Colorado crosses 14.1 miles of high and 4.0 miles of moderate sensitivity for paleontological resources on BLM-administered land; 2.8 miles of high and 1.0 mile of moderate sensitivity on state land; and 0.5 mile of high and 2.4 miles of moderate sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, and 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT-H in Utah crosses 14 geologic units. Of these geologic units, the Quaternary alluvium and colluvium, older Quaternary alluvium, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The North Horn Formation, Indianola Formation, Mancos Shale, and the Arapien Shale have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Green River Formation, Wasatch Formation, Flagstaff Formation, and Mesaverde Group have a high PFYC. There are 1.6 miles of high locality density and 14.0 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Utah)

Alternative COUT-H in Utah crosses 64.3 miles of high, 1.9 miles of moderate, and 11.9 miles of low sensitivity for paleontological resources on BLM-administered land; 7.7 miles of high sensitivity on USFS-administered land; 13.9 miles of high, 7.5 miles of moderate, and 0.4 mile of low sensitivity on state land; 2.3 miles of high and 0.4 mile of low sensitivity on tribal land; and 42.0 miles of high, 7.1 miles of moderate, and 16.4 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or moderate/unknown sensitivity (i.e., PFYC 3, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Alternative COUT-I

Affected Environment (Colorado)

Alternative COUT-I in Colorado crosses the same geologic units as Alternative COUT-A. Like Alternative COUT-A, there are no areas with high or moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Colorado)

Alternative COUT-I in Colorado crosses 14.1 miles of high and 4.0 miles of moderate sensitivity for paleontological resources on BLM-administered land; 2.8 miles of high and 1.0 miles of moderate sensitivity on state land; and 0.5 mile of high and 2.4 miles of moderate sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

Affected Environment (Utah)

Alternative COUT-I in Utah crosses 14 geologic units. Of these geologic units, the Quaternary alluvium and colluvium, older Quaternary alluvium, and Oligocene volcanic rocks have a low PFYC (Table 3-33). The North Horn Formation, Indianola Formation, Mancos Shale, and the Arapien Shale have a moderate/unknown PFYC. The Duchesne River Formation, Uinta Formation, Green River Formation, Wasatch Formation, Flagstaff Formation, and Mesaverde Group have a high PFYC. There are 1.6 miles of high locality density and 14.0 miles of moderate locality density within 1 mile of the reference centerline for this alternative route (Table 3-36).

Environmental Consequences (Utah)

Alternative COUT-I in Utah crosses 61.6 miles of high, 23.5 miles of moderate, and 19.9 miles of low sensitivity for paleontological resources on BLM-administered land; 12.9 miles of high, 0.3 miles of moderate, and 3.7 miles of low sensitivity on USFS-administered land; 14.9 miles of high, 6.5 miles of moderate, and 10.8 miles of low sensitivity on state land; 2.3 miles of high and 0.4 mile of low sensitivity on tribal land; and 33.3 miles of high, 4.9 miles of moderate, and 20.4 miles of low sensitivity on private land (Table 3-36 and MV-5). As a design feature of the Proposed Action (Table 2-8), areas with high or unknown sensitivity (i.e., PFYC 3b, 4, or 5) would be surveyed prior to construction to support development of the PRTP, which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with this alternative route.

TABLE 3-36
COMPARISON OF PALEONTOLOGICAL SENSITIVITY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Sensitivity[1] (miles)			Known Fossil Locality Density[2]			
		Low	Moderate/ Unknown	High	Unknown	Low	Moderate	High
Alternative COUT-A and Route Variation								
COUT-A	206.0	65.8	13.6	126.6	0.0	201.9	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*182.0*	*65.8*	*7.9*	*108.3*	*0.0*	*177.9*	*2.6*	*1.5*
COUT-A-1	205.6	65.8	13.6	126.2	0.0	201.5	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*181.6*	*65.8*	*7.9*	*107.9*	*0.0*	*177.5*	*2.6*	*1.5*
Alternative COUT-B and Route Variations								
COUT-B	216.0	57.6	13.6	144.8	0.0	211.9	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*192.0*	*57.6*	*7.9*	*126.5*	*0.0*	*187.9*	*2.6*	*1.5*
COUT-B-1	212.7	58.8	13.6	140.3	31.1	177.5	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*188.7*	*58.8*	*7.9*	*122*	*31.1*	*153.5*	*2.6*	*1.5*
COUT-B-2	214.2	58.8	13.6	141.8	31.1	179.0	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*190.2*	*58.8*	*7.9*	*123.5*	*31.1*	*155.0*	*2.6*	*1.5*
COUT-B-3	213.9	58.8	13.6	141.5	31.1	178.7	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*189.9*	*58.8*	*7.9*	*123.2*	*31.1*	*154.7*	*2.6*	*1.5*
COUT-B-4	214.2	58.8	13.6	141.8	31.1	179.0	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*190.2*	*58.8*	*7.9*	*123.5*	*31.1*	*155.0*	*2.6*	*1.5*
COUT-B-5	213.9	58.8	13.6	141.5	31.1	178.7	2.6	1.5
Colorado	*24.0*	*0.0*	*5.7*	*18.3*	*0.0*	*24.0*	*0.0*	*0.0*
Utah	*189.9*	*58.8*	*7.9*	*123.2*	*31.1*	*154.7*	*2.6*	*1.5*
Alternative COUT-C and Route Variations								
COUT-C	209.8	36.5	15.3	158.0	31.1	163.4	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*185.0*	*36.5*	*7.9*	*140.6*	*31.1*	*138.6*	*13.7*	*1.6*
COUT-C-1	206.4	37.7	15.3	153.4	31.1	160.0	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*181.6*	*37.7*	*7.9*	*136.0*	*31.1*	*135.2*	*13.7*	*1.6*
COUT-C-2	207.9	37.7	15.3	154.9	31.1	161.5	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*183.1*	*37.7*	*7.9*	*137.5*	*31.1*	*136.7*	*13.7*	*1.6*
COUT-C-3 (Agency Preferred Alternative)	207.6	37.7	15.3	154.6	31.1	161.2	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*182.8*	*37.7*	*7.9*	*137.2*	*31.1*	*136.4*	*13.7*	*1.6*
COUT-C-4	207.9	37.7	15.3	154.9	31.1	161.5	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*183.1*	*37.7*	*7.9*	*137.5*	*31.1*	*136.7*	*13.7*	*1.6*
COUT-C-5	207.6	37.7	15.3	154.6	31.1	161.2	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*182.8*	*37.7*	*7.9*	*137.2*	*31.1*	*136.4*	*13.7*	*1.6*

TABLE 3-36
COMPARISON OF PALEONTOLOGICAL SENSITIVITY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Sensitivity[1] (miles)			Known Fossil Locality Density[2]			
		Low	Moderate/ Unknown	High	Unknown	Low	Moderate	High
Alternatives COUT-H and COUT-I								
COUT-H (Applicant Preferred Alternative)	200.6	29.1	23.9	147.6	0.0	185.3	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*175.8*	*29.1*	*16.5*	*130.2*	*0.0*	*160.5*	*13.7*	*1.6*
COUT-I	240.2	55.2	42.6	142.4	0.0	224.9	13.7	1.6
Colorado	*24.8*	*0.0*	*7.4*	*17.4*	*0.0*	*24.8*	*0.0*	*0.0*
Utah	*215.4*	*55.2*	*35.2*	*125.0*	*0.0*	*200.1*	*13.7*	*1.6*

NOTES:
[1]Sensitivity: Low = PFYC 1 and 2, Moderate/Unknown = PFYC 3, and High = PFYC 4 and 5
[2]Known fossil localities: Low = 0 to 5 localities/square mile, Moderate = 6 to 15 localities/square mile, and High = greater than 15 localities/square mile
PFYC = Potential fossil yield classification

3.2.3.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A (MV-5) is located within the Wasatch Formation that has a high PFYC of 5, Miocene Rocks that has a moderate PFYC of 3, and the Cathedral Bluffs Tongue of the Wasatch Formation that has a moderate PFYC of 3. There are no fossil localities previously reported in Siting Area A.

Environmental Consequences

Siting Area A (MV-5) includes 33,688 acres. Implementation of the PRTP would occur before and during construction, resulting in low impacts on paleontological resources.

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B (MV-5) is located within the Bridger, Wasatch, and Green Formations that have a high PFYC of 5 and Quaternary Alluvium that has a low PFYC of 2. There are no fossil localities previously recorded in Siting Area B.

Environmental Consequences

Siting Area B (MV-5) includes 36,264 acres. Implementation of the PRTP would occur before and during construction, resulting in low impacts on paleontological resources.

Siting Area C – Maybell

Affected Environment

Siting Area C (MV-5) is located within the Browns Park Formation that has a high PFYC of 5, the Mancos Shale that has a moderate PFYC of 3, and Quaternary alluvium that has a low PFYC of 2. There are two previously recorded fossil localities within Siting Area C.

Environmental Consequences

Siting Area C (MV-5) includes 37,859 acres. Implementation of the PRTP would occur before and during construction, resulting in low impacts on paleontological resources.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D (MV-5) is located within the Lewis Shale, which has a PFYC of 3, the Browns Park Formation which has a PFYC of 5, and Quaternary Alluvium, which has a PFYC of 2. There are no fossil localities previously reported in Siting Area D.

Environmental Consequences

Siting Area D (MV-5) includes 26,976 acres. Implementation of the PRTP would occur before and during construction of the Series Compensation Station.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G (MV-5) is located within the Mancos Shale, which has a moderate PFYC of 3 and Quaternary Alluvium that has a low PFYC of 2. There are no fossil localities previously reported in Siting Area G

Environmental Consequences

Siting Area G (MV-5) includes 21,135 acres. Implementation of the PRTP would occur before and during construction, resulting in low impacts on paleontological resources

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F (MV-5) is located within T3 sediments assigned to Duchesne River, Uinta and Bridger Formations that have high PFYCs of 5 and Quaternary Alluvium that has a low PFYC of 2. There are no fossil localities previously reported in Siting Area F.

Environmental Consequences

Siting Area F (MV-5) includes 36,624 acres. Implementation of the PRTP would occur before and during construction, resulting low impacts on paleontological resources.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E (MV-5) is located within T3 sediments assigned to Duchesne River, Uinta and Bridger Formations, which have PFYCs of 5, and Quaternary Alluvium, which has a PFYC of 2. There are numerous (greater than 50) fossil localities previously reported in Siting Area E.

Environmental Consequences

Siting Area E (MV-5) includes 31,802 acres. Implementation of the PRTP would occur before and during construction of the Series Compensation Station.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.4 Water Resources

3.2.4.1 Introduction and Regulatory Framework

Water resources include surface waters such as rivers and streams (lotic waters); lakes, ponds, and reservoirs (lentic waters); and other waters such as wetlands, springs, and wells. The main focus of this section is to identify water resources and their susceptibility to potential Project impacts and residual impacts following implementation of design features of the Proposed Action and selective mitigation measures.

3.2.3.1.1 Regulatory Framework

Federal

- The **Water Pollution Control Act of 1948** was the first major U.S. law to address water pollution. Growing public awareness and concern for controlling water pollution led to sweeping amendments in 1972. As amended in 1977, the law became commonly known as the Clean Water Act (CWA), codified generally in 33 U.S.C. 1251 et. seq. The CWA's objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The following sections of the CWA may influence construction and maintenance of the Project:

- **Section 301: Effluent Limitations from Point Sources.** The volume of pollutants generated by a known source or point source is limited by specific water resources as described in Section 303(d). These limitations may affect the Project if a construction-related activity discharges a controlled pollutant such as sediment into regulated waters, which would require a permit.
- **Section 302: Water Quality Related Effluent Limitations.** Under Section 302, water quality standards designated by the state set levels of allowable pollutants called Total Maximum Daily Load (TMDL). This pollutant allotment criterion is designated for a specific waterbody relative to its particular usage (e.g., recreation, water supply, aquatic life, and agriculture). A water quality criterion (numeric pollutant concentrations and narrative requirements) is also designated to protect particular resource uses. If the Project has the potential to add pollutants to a particular resource that is protected by a TMDL, it may be necessary to mitigate impacts and potentially require the Project to be included in the TMDL permit.
- **Section 303: Water Quality Standards and Implementation Plans, Designation of Impaired Waters.** Water bodies not meeting state-mandated water quality standards are presented to the EPA for designation as Impaired Waters and issuance of federal protection under a TMDL. Impaired waters that may potentially be affected by the Project are subject to limitations set forth by the TMDL issued for the particular impaired water. If there is a high probability the Project will affect the impaired water, modification to the state construction general permit could be required.
- **Section 319: Effluent Limitations from Nonpoint Sources.** Nonpoint source pollution management under Section 319 of the CWA was created following the 1987 amendments to the CWA. Section 319 regulates the discharge of pollutants from various sources, which accumulate to reduce water quality standards set by the state. If the Project has the potential to add nonpoint source pollutants to a particular resource protected by a TMDL, it may be necessary to mitigate impacts and may potentially require the Project to be included into the TMDL permit.
- **Section 401**: **Water Quality Certification.** An application for a federally permitted activity that may result in a discharge into a water of the United States must obtain a Section 401 Water Quality Certification from the state with jurisdiction, certifying the action will not violate state or federal water quality standards.
- **Section 402**: **National Pollutant Discharge Elimination System (NPDES).** The NPDES regulates water-quality standards specifically by issuing and monitoring construction-related permits for discharges into waters of the State (described in more detail under the State Regulations section).
- **Section 404**: **Dredge or Fill in waters of the United States.** The CWA regulates the dredging or filling of any material in a water of the United States under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE). If the Project requires the dredge or fill in a water of the United States as defined in 33 CFR Part 328.3 of the CWA, it may be necessary to obtain a federal permit to conduct the work. As a provision of the federal permitting process, mitigation for the permanent loss of jurisdictional wetlands or other waters of the United States (U.S.) may be required by the USACE and EPA.
- **Programmatic General Permit 40: Minimal Impact Activities under the Stream Alteration Program for the State of Utah.** The District Engineer, Sacramento District, USACE issued Programmatic General Permit 40 for certain activities in waters of the U.S. that have been authorized under the State of Utah's Stream Alteration Program. This permit is

designed to eliminate duplication and expedite authorization of the activities that fall under the USACE Regulatory Program that have been authorized through a Stream Alteration Permit. This permit applies to all waters of the U.S. that are considered to be part of the surface tributary system and over which the State Engineer has regulatory authority under the Stream Alteration Program. Limits of the state of Utah's jurisdiction are defined in UAC R655-13, Stream Alteration. This permit does not apply to springs, lakes, fens, pool and riffle areas, wetlands, and some ephemeral waterbodies. Nor does it cover discharge or fill activities to waters of the U.S. on tribal lands or in emergency situations.

- **Safe Drinking Water Act.** Originally passed by Congress in 1974, the Safe Drinking Water Act protects public health by regulating the quality of drinking water. The law was amended in 1986 and 1996, requiring many actions to protect drinking water and its sources, which include rivers, lakes, reservoirs, springs, and groundwater wells. Under the Safe Drinking Water Act, the EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards, but does not regulate private wells that serve fewer than 25 individuals (EPA 2012b). The Safe Drinking Water Act also mandates a Groundwater Wellhead Protection Program be developed by each state to protect groundwater resources that serve as sources for public drinking water.
- **National Flood Insurance Program.** The National Flood Insurance Program is administered by Federal Emergency Management Area (FEMA), a component of the U.S. Department of Homeland Security. In support of the National Flood Insurance Program, FEMA identifies flood hazard areas throughout the United States, including Special Flood Hazard Areas, which are defined as areas of land that would be inundated by a flood having a 1 percent chance of occurring in any given year (previously referred to as the base flood or 100-year flood). Development may take place within Special Flood Hazard Areas, provided development complies with local floodplain management ordinances, which must meet the minimum federal requirements.
- **BLM RMP and Management Framework Plan** for the Rawlins Field Office in Wyoming (2008) specify regulations and goals for the management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend.
- **BLM RMPs and Management Framework Plans** for Colorado, including White River (1997, as amended), Little Snake (2011, as amended), and Grand Junction (1987, as amended) specify regulations and goals for management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend.
- **BLM RMPs and Management Framework Plans** for Utah, including those developed for the Richfield (2008), Fillmore (1987), Moab (2008), Price (2008), and Vernal (2008) Field Offices, as well as the Salt Lake District (1990), specify regulations and goals for management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend.
- **Utah BLM Riparian Policy (IM 2005-091).** The objective of the policy is to establish an aggressive riparian area management program that will identify, maintain, restore, and/or improve riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits; provide watershed protection while still preserving quality riparian-dependent aquatic and terrestrial species habitats; and, as appropriate, allow for reasonable resource uses (BLM 2010a).
- **Federal Antidegradation Policy.** The EPA requires each state and Tribal Nation to develop, adopt, and retain a statewide antidegradation policy regarding water quality standards and establish procedures for its implementation through the water quality management process. The State antidegradation policy and implementation procedures must be consistent with the detailed

three tier management components of Sections 131.13(a)(1), 131.12(a)(2), and 131.12(a)(3) of 40 CFR 131.12.

- **The Platte River Recovery Implementation Program of 1997.** Colorado, Wyoming, Nebraska, and the Department of Interior formed a unique partnership with the goal of developing a shared approach for managing the Platte River. The Platte River Recovery Implementation Program brings together the states (Wyoming, Colorado, and Nebraska), federal government, water users, and environmental groups to work collaboratively to improve and maintain the associated habitats for the designated species. The Program is intended to address the ESA concerns including loss of habitat in Central Nebraska by managing key land and water resources in the central Platte region and in the process avoiding harm to the lower Platte River stretch.
- **Upper Colorado Endangered Fish Recovery Program of 1999.** Under this program, any amount of surface water removed from the Upper Colorado River System above the confluence of the Gunnison River is considered to be a depletion of water and amounts greater than 0.1 acre-feet/year require formal consultation with the FWS for downstream impacts on threatened and endangered species.
- **Ashley, Manti-La Sal, and Uinta National Forest Land Resource Management Plans.** LRMPs for the Ashley (1986, as amended), Manti-La Sal (1986, as amended), and Uinta (2003, as amended) National Forests, as well as Standards and Guidelines detailed in the forest plans, require Project compliance with protective measures that ensure water resources and associated aquatic, biological, and geologic components are being maintained or improved. LRMPs also identify project restrictions to protect fish, wildlife, and management indicator species (MIS) for each forest.
- **The Utah Reclamation Mitigation and Conservation Commission** is an Executive branch agency of the federal government. The URMCC was authorized under the Central Utah Project Completion Act of 1992 (Utah State P.L. 102-575). The Act set terms and conditions for completing the Central Utah Project (CUP), which diverts, stores, and delivers large quantities of water from numerous Utah rivers. The URMCC is responsible for designing, funding, and implementing projects to offset the impacts on fish, wildlife, and related recreation resources caused by CUP and other federal reclamation projects in Utah. Lands owned and managed by the URMCC for CUP mitigation commitments are located in the Project area.

State Regulations

Wyoming

- **Wyoming Pollutant Discharge Elimination System (WYPDES).** The federal CWA provides that the discharge of any pollutants from a point source into surface waters of the U.S. must be regulated under the WYPDES Program. Through this program, administered by the Wyoming Department of Environmental Quality, operators of a point source discharge are required to obtain a WYPDES discharge permit. The permits contain limitations and conditions that will ensure the state's surface water quality standards are protected.
- **Wyoming Environmental Quality Act.** The Wyoming Environmental Quality Act (Wyoming Statues 35-11-101 through 35-11-1904) sets regulations on surface and subsurface disturbing activities to prevent, reduce, and eliminate pollution; to preserve and enhance the air and water, and reclaim the land of Wyoming; to plan the development, use, reclamation, preservation, and enhancement of the air, land, and water resources of the state; to preserve and exercise the primary responsibilities and rights of the state of Wyoming; to retain for the state the control over its air, land, and water and to secure cooperation between agencies of the state, agencies of other states, interstate agencies, and the federal government in carrying out these objectives.

- **Wyoming Department of Environmental Quality: Water Quality Division.** Water Quality Rules and Regulations includes stipulations for reclamation plan development; turbidity testing, reporting, and compliance in waters supporting municipalities with drinking water, and rules and regulations regarding spills of potentially hazardous liquids.

- **The 2007 Wyoming Framework Water Plan**. Volume I is an inventory of the state's water resources and related lands, a summary of the state's present water uses, a projection of future water needs, and an identification of alternative decisions to meet the indicated future water needs. Volume II provides future water resource planning direction to the State of Wyoming.
- **Carbon County Flood Damage Prevention Resolution.** Carbon County has adopted county-specific regulations that would require a floodplain development permit if channel modification (fill or grading in the floodplain) was required for the Project. Resolution 1983-11, as amended by Resolution 1989-10. FIRM Community Panel 560008.

Colorado

- **Colorado Water Quality Control Commission,** a subset of the CDPHE, is responsible for regulating Surface Water Quality Standards, Ground Water Quality Standards, Point Source Discharge Permits, Watershed Protection Control Regulations, CWA Section 401 Water Quality Certifications and Regulations, and Implementation of CWA Section 303(d) Requirements.
- **Rules and Regulations for Regulatory Floodplains in Colorado.** These rules are promulgated pursuant to the authority granted to the Colorado Water Control Board in Sections 24-4-103, 24-65.1-101(1)(c)(I), 24-65.1-202(2)(a)(I), 24-65.1-302(2)(a), 24-65.1-403(3), 30-28-111(1)–(2), 31-23-301(1)–(3), 37-60-106(1) and 37-60-106(1)(c)–(g), (j) and (k) of 2010. The purpose of these rules is to provide uniform standards for regulatory floodplains in Colorado, to provide standards for activities that may affect regulatory floodplains in Colorado, and to stipulate the process by which floodplains will be designated and approved by the Colorado Water Control Board. The rules for regulatory floodplains are of statewide concern to the State of Colorado and the Colorado Water Control Board to prevent flooding and the negative impacts of floods, as well as to ensure public health, safety, welfare, and property by limiting development in floodplains. These rules also assist the Colorado Water Control Board and communities in Colorado in developing sound floodplain management practices and implementing the National Flood Insurance Program. These rules shall apply throughout the State of Colorado, without regard to whether a community participates in the National Flood Insurance Program. These rules shall also apply to activities conducted by state agencies and to federal activities that are fully or partially financed by state funds. These rules also apply to projects or studies for which the Colorado Water Control Board has made a loan or grant pursuant to Sections 37-60-120(2) and 37-60-121(1)(b)(VII), and (IX)(C).

Utah

- **Utah Pollutant Discharge Elimination System.** Utah Administrative Code R317-8 mandates both direct and indirect discharges to waters of the State be regulated and permitted by the Utah Division of Water Quality, including surface-water discharges; wastewater discharges; indirect discharges; stormwater discharges from commercial, industrial, and municipal activities; groundwater discharges; and discharges resulting from underground injection. Construction General Permits for Stormwater Discharge, Hydrostatic Testing, and Dewatering likely will be required during construction of the Project.
- **Utah State Executive Order. 11988: Floodplain Management.** If structures are to be placed in a FEMA-designated flood-hazard area, a floodplain modification permit may be required.

- **Utah Division of Water Quality: Utah State Stream Alteration Permit.** Work done to the bed and banks of a named intermittent or perennial stream will require the issuance of a State Stream Alteration Permit and likely will require a USACE § 404 and 401 permit or a Programmatic General Permit 40, if applicable.

3.2.4.2 Issues Identified for Analysis

Issues related to water resources identified from scoping to identify, refine, and evaluate alternative routes, and to direct the level of analysis needed include (1) how the Project would affect water quality and (2) what short- and long-term potential impacts on water resources would be expected from implementation of the Project.

3.2.4.3 Regional Setting

Currently, alternative routes considered for the Project span 3 states, 6 ecoregions, and 23 subbasins, with elevations ranging from 3,838 to 13,478 feet above mean sea level and average annual precipitation ranging from 8.5 to 29.2 inches per year (EPA 2010b; Oregon State University 2012; USGS 1999, 2012d). Water resources throughout the Project area reflect the diversity of the landscape in their location, distribution, scale, type, abundance, and condition.

3.2.4.3.1 Hydrologic Unit Code and the Watershed Boundary Database

For this discussion, water resources occurring in the Project area are spatially referenced by the Watershed Boundary Database (WBD) and Hydrologic Unit Code (HUC). The WBD is maintained by the USGS and can be accessed through the NRCS Geospatial Data Gateway (USGS 2009a). Prior to the development of the WBD, the USGS developed a standardized system for organizing and collecting hydrologic data in the mid-1970s. This system divided and subdivided the country into progressively smaller hydrologic units based on surface features and classified them into four levels: regions, subregions, accounting units, and cataloging units (USGS and NRCS 2012).

> A hydrologic unit is a drainage area delineated to nest in a multi-level, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface waters. A hydrologic unit can accept surface water directly from upstream drainage areas, and indirectly from associated surface areas such as remnant, non-contributing, and diversions to form a drainage area with single or multiple outlet points. Hydrologic units are only synonymous with classic watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point (USGS 2009a).

The WBD is similar to the original HUC system developed by the USGS and establishes a baseline drainage boundary framework, accounting for all land and surface areas determined solely on science-based hydrologic principles. The WBD differs from the original system by differentiating surface-water drainage areas into six distinct levels rather than four. These six levels include regions (2-digit HUC), subregions (4-digit HUC), basins (6-digit HUC), subbasins (8-digit HUC), watersheds (10-digit HUC), and subwatersheds (12-digit HUC).

During consultation with land managers (i.e., BLM, USFS, and county soil and water conservation districts), representatives from the cooperating agencies indicated their preference to work with the standard fourth-level, 8-digit HUC system. The standard 8-digit HUC is broadly used and is applicable to this Project.

In most cases, water resources can be traced from their source in the upper reaches of a drainage area to a larger waterbody, namely an ocean. In some cases, however, waters are contained in a closed basin where there is no hydrologic connection to an ocean. In a closed basin, water either percolates into a groundwater system or evaporates into the atmosphere; such is the case for the Great Divide Subbasin (HUC 14040200) in Wyoming.

Using the WBD and preliminary Project designs, GIS analysis identified 23 subbasins crossed by alternative routes and route variations considered for the Project. Subbasins found in the Project area have vastly different attributes, including mean annual precipitation, drainage area, elevation ranges, and relative aspect (cardinal direction in which the watershed is oriented); all of which play a pivotal role in determining what ecological community or communities are supported in any given drainage area. Table 3-37 summarizes the subbasins in the Project area and provides attributes specific to each.

TABLE 3-37
SUBBASINS OCCURRING IN THE PROJECT AREA

Hydrologic Unit Code	Subbasin Name	Subbasin Acreage	Mean Annual Precipitation (inches)	Ecotype Present	Elevation Range (feet[1])
10180002	Upper North Platte	1,898,532	20.3	Southern Rockies	6,357 to 12,002
10180003	Pathfinder-Seminoe Reservoirs	661,009	13.2	Wyoming Basin	5,835 to 9,315
10180004	Medicine Bow	925,377	16.1	Southern Rockies	6,353 to 12,018
14010005	Colorado Headwaters-Plateau	2,450,331	19.4	Colorado Plateaus	4,310 to 11,450
14030001	Westwater Canyon	931,172	12.6	Colorado Plateaus	4,097 to 9,683
14030005	Upper Colorado-Kane Springs	1,455,306	12.7	Colorado Plateaus	3,838 to 12,648
14040200	Great Divide Closed Basin	2,459,882	9.3	Wyoming Basin	6,383 to 10,024
14050001	Upper Yampa	1,679,817	28.0	Southern Rockies	6,114 to 12,346
14050002	Lower Yampa	1,005,178	16.8	Colorado Plateaus	5,058 to 10,840
14050003	Little Snake	1,960,679	18.2	Colorado Plateaus	5,612 to 10,981
14050004	Muddy	644,970	13.4	Southern Rockies	6,242 to 8,462
14050007	Lower White	1,743,660	13.0	Colorado Plateaus	4,641 to 9,050
14060001	Lower Green-Diamond	627,343	10.9	Colorado Plateaus	4,641 to 9,742
14060003	Duchesne	1,713,446	19.5	Colorado Plateaus	4,641 to 13,478
14060004	Strawberry	744,712	21.2	Colorado Plateaus	5,484 to 10,571
14060005	Lower Green-Desolation Canyon	1,244,615	13.0	Colorado Plateaus	4,136 to 10,171
14060006	Willow	610,238	15.0	Colorado Plateaus	4,638 to 9,502
14060007	Price	1,206,454	14.0	Colorado Plateaus	4,139 to 10,440
14060008	Lower Green	1,194,429	8.8	Colorado Plateaus	3,867 to 9,492
14060009	San Rafael	1,555,982	12.8	Colorado Plateaus	3,992 to 11,286
16020201	Utah Lake	860,111	18.8	Central Basin and Range	4,480 to 11,913
16020202	Spanish Fork	615,961	23.7	Central Basin and Range	4,480 to 11,024
16030004	San Pitch	550,593	19.4	Central Basin and Range	5,032 to 11,188

SOURCES: Environmental Protection Agency 2010b; Oregon State University 2012; U.S. Geological Survey 1999, 2009a, 2010a
NOTE: [1]Elevation is represented as feet above mean sea level

3.2.4.3.2 Water Resource Categories

For this discussion, water resources in the Project area are grouped into three categories: specially designated waters, wetlands and riparian areas, and lentic and lotic waters.

For the discussion of wetlands, the FWS uses wetland classification codes (based on the Cowardin Code system [Cowardin 1979]) which consist of a series of letter and number codes that have been developed to adapt the national wetland classification system to map form. These alpha-numeric codes correspond to the classification nomenclature that best describes the habitat (for example, as found in Table 3-40, PEMC refers to the **P**alustrine [system], **EM**ergent [class], and [**C**]Seasonally Flooded [water regime modifier]) (FWS 2012a). The Cowardin Code system is the method adopted for this section.

Specially Designated Waters

State-listed Impaired Waters

Understanding where pollutants originate is a developing science in the field of water quality management. As authorized by the EPA under the CWA, the NPDES controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. Point sources are discrete conveyances such as pipes or man-made ditches that can be traced back to the original source. Since its introduction in 1972, the NPDES is responsible for significant improvements to our Nation's water quality (EPA 2012b).

State water quality control agencies, including the Utah Division of Water Quality, CDPHE, and the Wyoming Department of Environmental Quality, are required to monitor water quality in state waters and report the status of those waters to the EPA. Wyoming, Colorado, and Utah are responsible for submitting CWA § 305(b) water quality monitoring reports. In these reports, the state has an opportunity to present problematic waters that are in need of proactive management prescriptions to improve water quality by mandating point source discharge limitations through the EPA. The EPA reviews the Section 305(b) monitoring reports and determines if additional support to improve water quality is necessary.

If the EPA agrees that effluent levels are excessive, the water will then be listed under Section 303(d) of the CWA as impaired waters[1]. Once a water of the United States has been included on the Section 303(d) list, a TMDL report documenting point source pollutants, water quality trends, and management objectives is created. TMDLs are monitored biannually by the responsible agency to ensure effluent limitations are not being exceeded and management goals for improving water quality are being met. If it is determined that management objectives are not being met and that Section 303(d)-listed impaired waters are showing a declining trend in water quality, the TMDL report will be revised as appropriate to provide additional management objectives to meet water quality standards.

Until recently, nonpoint source pollution has been subject to relatively little regulatory attention by the states and EPA. Current management of nonpoint source pollution relies on the use of design features of a Proposed Action and a number of voluntary incentive programs (U.S. General Accounting Office 1999). Determining the source of a particular type of nonpoint pollution (e.g., sedimentation, discharge of nutrients, or pathogen-harboring effluent) is highly problematic. The States of Utah, Wyoming, and

[1]The term "303(d) list" is short for the list of impaired and threatened waters (stream/river segments, lakes) that the CWA (in section 303(d)) requires all states to submit for EPA approval. States' list water bodies as impaired when monitoring indicates they are not meeting their water quality standards. If the state believes that a water body may not meet its water quality standards in the future, the state may also choose to add the water body to the 303(3) list as threatened. If evidence indicates that the water body is impaired of threatened due to the excess loading of a pollutant, the CWA requires the state to develop a TMDL for the water body, specific to that pollutant. Regulations say states must evaluate "all existing and readily available information" in developing their 303(d) lists(www.epa.gov/region8/water/tmdl).

Colorado are responsible for collecting and disclosing data from statistical modeling and physical investigation of potential sources of nonpoint source pollutants in their bi-annual Section 305(d) monitoring reports. Data gathered on potential nonpoint source pollutants are often integrated into TMDLs where management objectives can be developed specifically for nonpoint source pollutants. State-listed impaired waters crossed by the alternative routes were identified during the water resources inventory.

Outstanding National Resource Waters

Outstanding National Resource Waters designated pursuant to Water Quality Standards Regulation Section 131.12(a)(3) of the National Antidegradation Policy are hereafter referred to as outstanding waters. Listing waters as outstanding is done to protect the physical and biological integrity of waters and to maintain water quality. Outstanding waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through the implementation of appropriate design features.

Outstanding waters are designated by the state as significant resources for a number of different reasons including but not limited to habitat for sensitive aquatic species, sources of municipal water, prime or relatively undisturbed habitats, or waters which have a high degree of aesthetic or educational appeal.

In the Project area, states have designated specific stream reaches or a suite of waters within a specified boundary (political and physical) as outstanding. In Wyoming, the main stem North Platte River from the mouth of Sage Creek (approximately 15 stream miles downstream of Saratoga, Wyoming) upstream to the Colorado state line; and all surface waters located within the boundaries of national parks and congressionally designated wilderness areas as of January 1, 1999, are considered outstanding waters. In Utah, numerous waters in the Green River Subbasin, the Provo River Subbasin, and the Sevier River Subbasin, as well as all surface waters geographically located within the outer boundaries of National Forests, listed as Category 2 waters under Utah State Code R317-2-12.2 are considered outstanding waters. State-listed outstanding waters crossed by alternative routes considered for the Project were identified during the water resources inventory.

Palustrine Forested Wetlands

Palustrine Forested Wetlands in the Project area are typically associated with perennial water resources and confined to a narrow riparian band parallel to a water resource with soils and hydrology adequate for the establishment, recruitment, and persistence of forested wetlands. Because of the unique habitat features and biochemical processing functions associated with forested wetlands, the EPA and USACE regard these communities as highly valuable commodities due to (1) their functionality for protecting and improving water quality through dissipation of flood velocity and demobilization of waterborne sediment, (2) the deposition of organic material into the stream and underlying soil, and (3) the provision of habitat that is used by a multitude of species dependent on these wetlands for all or a portion of their life stages (e.g., obligates, semi-obligates). Due to the infrequency and high value of this wetland type throughout the Project area, these wetlands have been included in the Specially Designated Waters category. Palustrine forested wetlands crossed by alternative routes considered for the Project were identified during the water resources inventory.

Wetlands and Riparian Areas

There is a high level of variety in the composition, distribution, and abundance of wetlands and riparian areas across the Project area; and water resources hydrologically connected to wetland and riparian areas are indirectly affected by the condition of those vegetation components. Wetlands and riparian areas function similarly in their capacity to maintain or even improve water quality by filtering waterborne sediments and cycling nutrients into the soil. The fibrous root systems and perennial nature of most

wetland and riparian communities provide soil stabilizing structure to the upper soil strata, reducing the likelihood that high flows and heavy rain events would wash away topsoil. Wetlands and riparian areas serve as vectors for the percolation of surface water into groundwater systems (groundwater recharge), a process responsible for maintaining stable inputs into groundwater aquifers.

Wetlands and riparian areas also provide a high level of biotic nutrient exchange through the provision of detritus and large wood debris that promote productive, living, breathing soils. Abiotic processes are also commonplace in the vegetation and groundcover associated with wetlands and riparian areas. Highly dense scrub-shrub and forested wetlands attenuate flood flows, thus reducing the erosive potential of high velocity runoff events. Canopy cover of mature scrub-shrub and forested wetlands and riparian areas shade water resources, maintaining—and in some cases improving—the quality and quantity of water through temperature control. It is because of these functions and values provided by intact, undisturbed wetlands and riparian areas that they have been included in this analysis. Because wetland and riparian areas are so important to the maintenance of water quality, they are included in this section and are analyzed on the basis that removal or modification of these vegetation communities would have indirect, adverse effects on water quality.

Wetlands and riparian areas are also discussed in Section 3.2.5.5 of this document. There, a quantitative analysis of the potential Project related modification of surface vegetation associated with these habitats is discussed. While a discussion of the potential impacts on the vegetative communities is vital to providing an analysis of the full suite of potential Project effects, it does not relate the modification of those communities to water quality.

By definition, riparian means occurring next to water. It is a common misunderstanding that all riparian vegetation is inherently wetland vegetation because it occurs near water. Many water resources in the Project area support riparian vegetation, but the water source may be available for plant uptake on a short-term, intermittent basis or on a long-term, perennial basis. On a perennial river or stream, it is common to find wetland plants in the riparian zone, but when streams are intermittent or ephemeral, water is available for plant uptake only briefly each year or may not be present in drought years. In these circumstances, upland vegetation existing near the margins of intermittent or ephemeral waters would be of a noticeably different species from the surrounding plant communities or would have a noticeably different growth form or relative vigor due to the presence of water, brief as it may be in any given year. While these plants are not what many consider to be riparian species, they are discernible from the surrounding plant community and thus are considered riparian vegetation in a riparian area.

Wetlands are dependent on a consistent and usually perennial source of hydrology. Whether it is groundwater, surface water, springs, seeps, or an anthropogenic source (irrigation), wetlands exist where adequate hydrology is present. Wetlands are present throughout the Project area and can range from special aquatic sites such as mud flats and playas to emergent wetlands, scrub-shrub wetlands, and forested wetlands.

The standard classification for wetlands and deepwater habitats is derived from *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) which is in turn the standard adopted for this discussion. The Cowardin Code, as it is commonly referred to, takes a hierarchical approach to classifying wetlands and other waters based on their geographic orientation (System), flow or tidal characteristics (Subsystem), and physical make-up (Class). Cowardin codes are used in this analysis to differentiate wetlands because of the vast differences in ecological services provided by different wetland types and the differences in the sensitivity of different wetland types to disturbance.

Wetland and riparian data were derived mainly from two sources: the National Wetlands Inventory (NWI) (FWS 2012a) and the Southwest Region Gap Analysis Program (SWReGAP) (USGS 2010b, 2012c). The NWI was established by the FWS in 1974 to conduct a nationwide inventory of wetlands in the United

States for providing information on the distribution of wetlands, thus aiding in wetland conservation efforts. The SWReGAP data provide regional assessments of natural land-cover types to facilitate the application of this information to land-management activities. These data were combined and overlaid on preliminary Project designs as a basis to identify potential impacts from alternative routes considered for the Project.

Wetlands and riparian areas are found throughout the Project area and include Palustrine Scrub/Shrub Wetlands, Palustrine Emergent Wetlands, swamps, marshes, and estuaries. Riparian areas consist of those mapped by the SWReGAP and those wetland habitats classified as the Cowardin littoral subclass (refer to Appendix E.1). Even though wetlands and riparian areas are found throughout the Project area, they are limited in their range and diversity due to low annual precipitation; short growing seasons; cold, long winters; and hot, dry summers. Wetlands and riparian areas crossed by alternative routes considered for the Project were identified during the water resources inventory.

Lentic waters in the Study Area – Reservoirs, Lakes, and Ponds

Lentic waters are characterized as having standing or relatively still water contained in a closed or semi-closed impoundment. Lentic waters in the Project area include lakes, reservoirs, and ponds that can be categorized using the Cowardin system (Cowardin et al. 1979) under the lacustrine deepwater habitat system. Lentic waters are highly variable throughout the Project; many are man-made, serving the purpose of storing water for municipal and agricultural uses and controlling floods. There are many natural lentic waters ranging from the high alpine lakes of the Big Sandy, Blacks Fork, and Duchesne subbasins to warm water lakes and ponds of the Little Snake, Provo, and Lower Green River subbasins, as well as unique lentic waters such as the ephemeral desert playas of the Great Divide closed-basin subbasin.

Lentic waters exhibit a high degree of spatial and temporal heterogeneity that can be broken generally into three zones: the pelagic or open water zone, the benthic zone or bed and banks zone, and the profundal zone (the zone in which light does not penetrate) (Kalff 2002). These zones support local intrazonal and somewhat interactive interzonal abiotic physical and chemical interactions that lend to a wide variety of biotic interactions among plants, animals, and micro-organisms inhabiting the different zones (Brown 1987). Some perennial lentic waters are named; whereas, most intermittent or ephemeral lentic waters are not named. Named lentic waters crossed by alternative routes were identified in the water resources inventory (Section 3.2.4.4).

Lotic waters in the Study Area – Rivers, Streams, and Deepwater Habitats

Lotic waters are characterized as having flowing water in a state of continual physical change (Giller and Malmqvist 1998). Lotic waters in the Project area include rivers and streams (perennial, intermittent, and ephemeral). These waters vary greatly throughout the Project area, mainly due to variations in terrain, aspect, geology, and precipitation specific to the drainage areas from which they originate. At a finer scale, lotic waters exhibit a high degree of spatial and temporal heterogeneity (microhabitats) that support a wide variety of biotic interactions among plants, animals, and micro-organisms, as well as abiotic physical and chemical interactions (Campbell et al. 2009).

Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands. These habitats include environments where surface water is permanent and often deep so that water rather than air is the principal medium within which the dominant organisms live, regardless of whether they are attached to the substrate. As in wetlands, the dominant plants are hydrophytes; however, the substrates are considered nonsoil because the water is too deep to support emergent vegetation (U.S. Soil Conservation Service 1975). Wetlands and deepwater habitats are defined separately because, traditionally, the term wetland has not included deep permanent water; however, both must be considered in an ecological approach to classification (Cowardin et al. 1979).

Most of the significant lotic waters found in the Project area have conventional names (e.g., Medicine Bow River or Red Creek), but the majority of intermittent and ephemeral streams do not. Rather than relying solely on conventional names, lotic waters can be identified using two highly interconnected datasets, the WBD HUC and the National Hydrography Dataset (NHD). As discussed previously, the HUC identifies where a water resource exists spatially within a drainage area. The NHD on the other hand comprises digital vector data features such as lakes, ponds, streams, rivers, canals, dams, and stream gauges. The NHD enables GIS technologies to take advantage of attributes embedded in the NHD to generate specialized information. These analyses are possible because the NHD contains a flow network that allows for tracing water downstream or upstream. It also uses an address system based on reach codes and linear referencing to link specific information to the WBD HUC. Named lotic waters crossed by alternative routes were identified in the water resources inventory.

Springs and Wells

Springs and wells are significant sources of water for municipalities, homesteads, livestock, and wildlife in the Project area. Springs are defined as places where groundwater flows naturally to the Earth's surface. Given their flowing characteristic, springs are considered lotic waters. Springs are found throughout the Project area in many forms typically categorized by the volume of water emanating from a particular site. Springs common to the Project area are those that have infiltrated the Earth's surface through cracks or fissures. Typically, springs result from a pressure differential in an aquifer created by perched groundwater aquifers or aquifers that occur at a higher elevation than a permeable area, which water can easily infiltrate (Bates and Jackson 1987). For this discussion, wells are limited to water wells developed for municipal and agricultural applications. Springs and wells located within 300 feet of the reference centerlines of the alternative routes considered for the Project were identified in the water resources inventory.

3.2.4.4 Study Methodology

3.2.4.4.1 Inventory

Information for the water resources inventory was obtained from scientific literature, governmental agencies, and institutions, including but not limited to the BLM, USFS, NRCS, EPA, FWS, FEMA, USGS, Utah Division of Water Resources and other state agencies. Water resources identified during inventory analysis include perennial streams, intermittent/ephemeral streams, lakes, reservoirs, ponds, springs, wells, wetlands, and riparian areas. In addition to identifying all physical water resources, drainage areas based on an 8-digit HUC crossed by alternative routes and route variations were identified specifically to give a spatial reference for where water resources occur in the Project area. For discussion purposes, water resources inventory information is organized into three categories, (1) specially designated waters, (2) wetlands and riparian areas, and (3) lentic and lotic waters.

Specially Designated Waters

Specially designated waters are water resources that have federal or state protective measures associated with them, as well as a degree of uniqueness on the landscape or are particularly susceptible to impacts. Specially designated waters include impaired waters listed on the CWA Section 303(d) list, outstanding waters, and Palustrine Forested Wetlands. Specially designated waters crossed by alternative route reference centerline are summarized in the following tables.

State-listed Impaired Waters

In the Project area, 35 waters (both lentic and lotic) crossed by alternative routes are listed on the CWA Section 303(d) list of impaired waters. Table 3-38 summarizes the listed impaired waters crossed by alternative routes of the Proposed Action. Some waters are crossed more than once.

TABLE 3-38
STATE-LISTED IMPAIRED WATERS CROSSED BY ALTERNATIVE ROUTES

Alternative Route	Subbasin (Hydrologic Unit Code)	Impaired Water (Identification Number)	Location Description	Water Name[1]	Source of Impairment	Cause of Impairment
All COUT BAX alternative routes	Westwater Canyon (14030001)	Cottonwood Wash (UT14030001-001_00)	Cottonwood Wash from Colorado River confluence to headwaters	Cottonwood Wash	Non-point Source	Unknown
All COUT BAX alternative routes	Westwater Canyon (14030001)	Westwater Creek (UT14030001-003_00)	Westwater Creek and tributaries from confluence with Colorado River to headwaters	Westwater Creek	Non-point Source	Unknown
WYCO-D and route variation	Upper Yampa (14050001)	Fortification Creek (COLCLY05_8000)	Mainstem of Fortification Creek from the confluence of The North Fork and South Fork to the confluence with the Yampa River	Fortification Creek	Unknown	Selenium
WYCO-B, WYCO-C, and WYCO-F and route variations	Lower Yampa (14050002)	Yampa River (COLCLY02_8100)	Mainstem of the Yampa River from a point immediately above the confluence with Lay Creek to the confluence with the Green River	Yampa River	Unknown	Iron
WYCO-D and route variation	Muddy (14050004)	Muddy Creek-1 (WYLS140500040104_01)	From the confluence with Red Wash upstream to the confluence with Antelope Creek	Muddy Creek	Grazing, Non-point source	Habitat Alterations
	Muddy (14050004)	Muddy Creek-2 (WYLS140500040308_01)	From below the confluence with Youngs Draw upstream to the confluence with Deep Creek	Muddy Creek	Non-point source, natural	Selenium, Chloride

TABLE 3-38
STATE-LISTED IMPAIRED WATERS CROSSED BY ALTERNATIVE ROUTES

Alternative Route	Subbasin (Hydrologic Unit Code)	Impaired Water (Identification Number)	Location Description	Water Name[1]	Source of Impairment	Cause of Impairment
All COUT BAX and COUT alternative routes and route variations	Lower White (14050007)	West Evacuation Creek and Douglas Creek (COLCWH22_8501)	All tributaries to the White River, including all wetlands, lakes and reservoirs, from a point immediately above the Confluence with Douglas Creek to the Colorado/Utah border, except for specific listing in segment 23	Douglas Creek, Dripping Rock Creek, East Twin Wash, Stinking Water Creek, West Twin Wash, Willow Creek	Unknown	Sedimentation/silt
All COUT BAX alternative routes	Lower White (14050007)	Evacuation Creek (UT14050007-003_00)	Evacuation Creek and tributaries from the confluence with White River to headwaters	Evacuation Creek, Little Whiskey Creek, Missouri Creek, Texas Creek, Whiskey Creek	Non-point source, Agriculture	Total Dissolved Solids
COUT-A and COUT-B and route variations	Duchesne (14060003)	Dry Gulch Creek (UT14060003-009_00)	Dry Gulch Creek and tributaries from confluence with Duchesne River to headwaters	Dry Gulch Creek, Knight Ditch, Lake Fork River, Montes Creek, North Lateral C Canal, Uinta River	Non-point Source, Agriculture, Natural/ Wildlife	Total Dissolved Solids
	Duchesne (14060003) and Strawberry (14060004)	Lake Fork-1 (UT14060003-008_00)	Lake Fork River and tributaries from confluence Duchesne River to Pigeon Water Creek confluence	Duchesne River, Knight Ditch, Lake Fork River, Lateral Number 5, Midview Ditch, Moon Lake Canal, Sowers Creek, Gray Mountain Canal, Currant Creek, Red Creek, Strawberry River	Non-point Source	Total Dissolved Solids
	Duchesne (14060003)	Uinta River-2 (UT14060003-004_00)	Uinta River and tributaries from Dry Gulch confluence upstream to U.S. Highway 40	Uinta River	Non-point Sources, Agriculture, Habitat Alterations, Natural/wildlife	Physical Substrate Habitat Alterations; Total Dissolved Solids

TABLE 3-38
STATE-LISTED IMPAIRED WATERS CROSSED BY ALTERNATIVE ROUTES

Alternative Route	Subbasin (Hydrologic Unit Code)	Impaired Water (Identification Number)	Location Description	Water Name[1]	Source of Impairment	Cause of Impairment
COUT-B and route variations	Duchesne (14060003)	Duchesne River-3 (UT14060003-006_00)	Duchesne River from Myton to Strawberry River confluence	Duchesne River	Non-point Source	Benthic-Macroinvertebrate Bioassessments
COUT-C and route variations, COUT-H, and COUT-I	Willow (14060006)	Willow Creek (UT14060006-001_00)	Willow Creek and tributaries from Green River confluence to Meadow Creek confluence (excluding Hill Creek)	Willow Creek	Non-point source, unknown	Unknown
All COUT BAX alternative routes, COUT-B and COUT-C and route variations, COUT-H, and COUT-I	Price (14060007) and San Rafael (14060009)	Price River-Woodside to Soldier Creek (UT14060007-014)	Price River and tributaries from near Woodside to Soldier Creek confluence	Beaver Creek, Bear Creek, Gooseberry Creek, Deer Creek, Dry Fork, Grassy Trail Creek, Horse Creek, Icelander Creek, Kyune Creek, Price River, Right Fork Kyune Creek, Miller Creek, Mud Creek, Price River, Serviceberry Creek, Tabbyune Creek, White River, Willow Creek, West Fork Willow Creek, Whetstone Creek	Point/Nonpoint Source	Salinity/Total Dissolved Solids/Chlorides
COUT BAX-B and COUT BAX-C	Price (14060007)	Price River-5 (UT14060007-015)	Price River and tributaries from confluence with Green River to near Woodside	Price River	Point/Nonpoint Source	Salinity/Total Dissolved Solids/Chlorides
COUT BAX-E, and COUT-H	Price (14060007)	Gordon Creek and Tributaries (UT14060007-006)	Gordon Creek from confluence with Price River to headwaters	North Fork Gordon Creek	Point/Nonpoint Source	Total Dissolved Solids

TABLE 3-38
STATE-LISTED IMPAIRED WATERS CROSSED BY ALTERNATIVE ROUTES

Alternative Route	Subbasin (Hydrologic Unit Code)	Impaired Water (Identification Number)	Location Description	Water Name[1]	Source of Impairment	Cause of Impairment
All COUT BAX alternative routes, COUT-H, and COUT-I	San Rafael (14060009)	Huntington Creek-1 (UT14060009-010_00)	Huntington Creek and tributaries from confluence with Cottonwood Creek to Highway 10	Cedar Creek, Cottonwood Creek, Huntington Canal, Deer Creek, Huntington Creek, Indian Creek, Mammoth Canal, Whetstone Creek	Point/Nonpoint Source	Selenium
COUT BAX-E, COUT-H, and COUT-I	San Rafael (14060009)	Deer Creek (UT14060009-003)	Huntington Creek in Castle Valley, Huntington Creek - U.S. Highway 10 to Headwaters	Upper Huntington Creek	Point Source-Pacific Corp - Deer Creek Coal Plant	Ammonia, Chlorine, Total Dissolved Solids
COUT-A, COUT-B, and COUT-C and route variations	Spanish Fork (16020202)	Soldier Creek-1 (UT16020202-012)	Soldier Creek from confluence with Thistle Creek to confluence of Starvation Creek	Soldier Creek	Nonpoint Source	Phosphorus, Sedimentation/ Siltation, Total Suspended Solids
	Spanish Fork (16020202)	Thistle Creek-1 (UT16020202-022_00)	Thistle Creek from confluence with Soldier Creek to confluence with Little Clear Creek	Thistle Creek	Unknown	Unknown

SOURCES: Envirionmental Protection Agency 2012c, d, e, f; U.S. Geological Survey 2009a, 2010a
NOTE: [1]Named streams included in the impaired water listing crossed by reference centerline.

State-listed Outstanding Waters

A total of 161 outstanding waters are crossed by alternative routes. These waters include 36 perennial streams, 117 intermittent streams, 2 springs, 1 perennial lake/pond, 3 intermittent lake/ponds, 1 canal, and 1 connector canal. Named outstanding waters designated by Wyoming and Utah are summarized in Table 3-39. Many outstanding waters or tributaries of those waters are not named but are identified by their specific reach code. There were no outstanding waters identified in the Project area in Colorado.

TABLE 3-39
STATE-LISTED OUTSTANDING WATERS CROSSED BY ALTERNATIVE ROUTES

Link	Water Name	Reach Code	Water Type
Wyoming			
Upper North Platte Subbasin (HUC 10180002)			
W30	North Platte River	10180002	Perennial stream
Utah			
Duchesne Subbasin (HUC 14060003)			
U420	Duchesne River	14060003	Perennial stream
U431	South Lost Hollow	14060003003475	Intermittent stream
U431	North Lost Hollow	14060003003476	Intermittent stream
U431	Quitchampau Canyon	14060003003480	Intermittent stream
U431	Jolie Hollow	14060003003486	Intermittent stream
U431	Trail Hollow	14060003003493	Intermittent stream
U431	Broad Hollow	14060003003494	Intermittent stream
U431	Wire Fence Canyon	14060003004307	Intermittent stream
U431	Unnamed	14060003009485	Intermittent stream
U431	Unnamed	14060003009505	Intermittent stream
U431	Unnamed	14060003009523	Intermittent stream
U431	Unnamed	14060003009537	Intermittent stream
U431	Unnamed	14060003009547	Intermittent stream
U431	Unnamed	14060003009559	Intermittent stream
U431	Unnamed	14060003009572	Intermittent stream
U431	Unnamed	14060003009600	Intermittent stream
U431	Unnamed	14060003009601	Intermittent stream
U431	Sowers Creek	14060003003473	Perennial stream
U431	Sowers Creek	14060003003474	Perennial stream
U431	Sowers Creek	14060003003477	Perennial stream
U431	Sowers Creek	14060003003481	Perennial stream
U431	Sowers Creek	14060003003488	Perennial stream
U431	Sowers Creek	14060003003490	Perennial stream
U431	Sowers Creek	14060003003492	Intermittent stream
U431	Trapper Canyon	14060003003489	Intermittent stream
U431	Unnamed	14060003009571	Intermittent stream
U431	Sowers Creek	14060003003492	Perennial stream
U431	Unnamed	14060003009497	Intermittent stream
U431	Sowers Creek	14060003003472	Perennial stream
U431	Unnamed	14060003009599	Intermittent stream
U431	Unnamed	14060003009540	Intermittent stream
U431	Sowers Creek	14060003003478	Perennial stream
U431	Sowers Creek	14060003003483	Perennial stream
U431	Unnamed	14060003009531	Perennial stream
U431	Sowers Creek	14060003003484	Perennial stream
U431	Clem Hollow	14060003003479	Intermittent stream

TABLE 3-39 STATE-LISTED OUTSTANDING WATERS CROSSED BY ALTERNATIVE ROUTES			
Link	**Water Name**	**Reach Code**	**Water Type**
U431	Unnamed	14060003009525	Intermittent stream
U431	Unnamed	14060003009519	Intermittent stream
U431	Unnamed	14060003009506	Perennial stream
U431	Sowers Creek	14060003003482	Perennial stream
U431	Mine Hollow	14060003003502	Intermittent stream
U431	Sowers Creek	14060003003495	Intermittent stream
U431	Sowers Creek	14060003003474	Perennial stream
Strawberry Subbasin (HUC 14060004)			
U424	French Hollow	14060004000603	Intermittent stream
U424	Unnamed	14060004000604	Intermittent stream
U424	Unnamed	14060004002046	Intermittent stream
U424	Unnamed	14060004002155	Intermittent stream
U424	Unnamed	14060004002213	Intermittent stream
U424	Unnamed	14060004002214	Intermittent stream
U424	Unnamed	14060004002245	Intermittent stream
U424	Unnamed	14060004002252	Intermittent stream
U424	Unnamed	14060004002303	Intermittent stream
U424	Strawberry River	14060004000124	Perennial stream
U424	Center Canyon	14060004000605	Intermittent stream
U424	Unnamed	14060004000516	Intermittent stream
U424	Strawberry River	14060004000123	Perennial stream
U428	Trail Hollow	14060004000587	Intermittent stream
U428	Unnamed	14060004000587	Perennial stream
U429	Buffalo Canyon	14060004000608	Intermittent stream
U429	Unnamed	14060004002471	Intermittent stream
U429	Unnamed	14060004004410	Intermittent lake/pond
U429	Unnamed	14060004004406	Intermittent lake/pond
Lower Green-Desolation Canyon Subbasin (HUC 14060005)			
U401	Unnamed	14060005000492	Intermittent stream
U401	Unnamed	14060005002854	Intermittent stream
Price Subbasin (HUC 14060007)			
U530	Price River	14060007000165	Perennial stream
U600	Unnamed	14060007005587	Intermittent stream
U600	Unnamed	14060007005608	Intermittent stream
U600	Boarding House Canyon	14060007005754	Intermittent stream
U600	Unnamed	14060007005851	Intermittent stream
U600	Gooseberry Creek	14060007000180	Perennial stream
San Rafael Subbasin (HUC 14060009)			
U600	Swens Canyon	14060009000581	Intermittent stream
U600	Burnout Canyon	14060009000582	Intermittent stream
U600	North Fork Swens Canyon	14060009001108	Intermittent stream
U600	Unnamed	14060009001109	Intermittent stream
U600	Upper Huntington Creek	14060009000960	Perennial stream
U600	Unnamed	14060009001113	Intermittent stream
U600	Swens Canyon	14060009000581	Intermittent stream
U600	Unnamed	14060009005856	Perennial lake/pond
U629	Maple Gulch	14060009000612	Intermittent stream
U629	Unnamed	14060009001278	Connector
U629	Unnamed	14060009001308	Intermittent stream

TABLE 3-39 STATE-LISTED OUTSTANDING WATERS CROSSED BY ALTERNATIVE ROUTES			
Link	**Water Name**	**Reach Code**	**Water Type**
U629	Mariunus Canyon	14060009001336	Intermittent stream
U629	Unnamed	14060009001412	Intermittent stream
U629	Unnamed	14060009001422	Intermittent stream
U629	Unnamed	14060009001436	Intermittent stream
U629	Unnamed	14060009001493	Intermittent stream
U629	Cottonwood Creek	14060009000133	Intermittent stream
U629	Deer Creek	14060009000611	Perennial stream
U629	Whetstone Creek	14060009000323	Intermittent stream
U629	Unnamed	14060009001430	Intermittent stream
U629	Unnamed	14060009001441	Intermittent stream
U629	Unnamed	14060009001426	Intermittent stream
U629	Unnamed	Not applicable	Spring/seep
U630	Unnamed	14060009000657	Intermittent stream
U630	Booths Canyon	14060009001243	Intermittent stream
U630	Booths Canyon	14060009001247	Intermittent stream
U630	Dry Canyon	14060009001256	Intermittent stream
U630	Indian Creek	14060009000143	Perennial stream
U630	Unnamed	14060009001242	Intermittent stream
U630	North Fork Coal Fork	14060009006915	Canal/ditch
U630	Unnamed	14060009005897	Intermittent lake/pond
Utah Lake Subbasin (HUC 16020201)			
U639	Unnamed	16020201000802	Intermittent stream
U639	Unnamed	16020201003064	Intermittent stream
U650	Unnamed	16020201000414	Intermittent stream
U650	Unnamed	16020201002867	Intermittent stream
U650	Forbs Canyon	16020201002918	Intermittent stream
U650	Unnamed	16020201002919	Intermittent stream
U650	Unnamed	16020201003072	Intermittent stream
U650	Rocky Ridge Canyon	16020201003082	Intermittent stream
U650	Salt Spring Canyon	16020201003101	Intermittent stream
Spanish Fork Subbasin (HUC 16020202)			
U433	Right Fork Timber Canyon	16020202000645	Intermittent stream
U433	Unnamed	16020202000659	Intermittent stream
U433	Unnamed	16020202000660	Intermittent stream
U433	Unnamed	16020202000661	Intermittent stream
U433	Unnamed	16020202000662	Intermittent stream
U433	Unnamed	16020202001641	Intermittent stream
U433	Unnamed	16020202001647	Intermittent stream
U433	Unnamed	16020202001669	Intermittent stream
U433	Unnamed	16020202001691	Intermittent stream
U433	Tank Hollow	16020202001702	Intermittent stream
U433	Unnamed	16020202001706	Intermittent stream
U433	Sheep Creek	16020202000241	Intermittent stream
U433	Sheep Creek	16020202000241	Perennial stream
U433	Tie Fork	16020202000252	Perennial stream
U433	Sheep Creek	16020202000240	Perennial stream
U433	Unnamed	16020202001656	Intermittent stream
U460	Unnamed	16020202000582	Intermittent stream
U460	Unnamed	16020202000583	Intermittent stream

TABLE 3-39 STATE-LISTED OUTSTANDING WATERS CROSSED BY ALTERNATIVE ROUTES			
Link	**Water Name**	**Reach Code**	**Water Type**
U460	Unnamed	16020202001695	Intermittent stream
U460	Unnamed	16020202001698	Intermittent stream
U460	Unnamed	16020202001701	Intermittent stream
U530	Unnamed	16020202001845	Intermittent stream
U530	Indian Creek	16020202000623	Perennial stream
U539	Water Hollow	16020202000593	Intermittent stream
U539	Garner Canyon	16020202000655	Intermittent stream
U539	Heslington Canyon	16020202000656	Intermittent stream
U539	Unnamed	16020202000657	Intermittent stream
U539	Unnamed	16020202001756	Intermittent stream
U539	Unnamed	16020202001763	Intermittent stream
U539	Unnamed	16020202001775	Intermittent stream
U539	Unnamed	16020202001808	Intermittent stream
U539	Unnamed	16020202001809	Intermittent stream
U539	Hicks Canyon	16020202001810	Intermittent stream
U539	Unnamed	16020202001815	Intermittent stream
U539	Unnamed	16020202001827	Intermittent stream
U539	Sheep Creek	16020202000236	Perennial stream
U539	Tie Fork	16020202000243	Perennial stream
U539	Spring/Seep	Not applicable	Intermittent stream
U621	Cox Canyon	16020202000563	Intermittent stream
U621	Blind Canyon	16020202000565	Perennial stream
U621	Unnamed	16020202001822	Intermittent stream
U621	Unnamed	16020202001833	Intermittent stream
U621	Unnamed	16020202001837	Intermittent stream
U621	Unnamed	16020202001847	Intermittent stream
U621	Unnamed	16020202001859	Intermittent stream
U625	Left Fork Spencer Creek	16020202002090	Perennial stream
San Pitch Subbasin (HUC 16030004)			
U600	Cottonwood Creek	16030004000068	Perennial stream
U600	Maple Fork Creek	16030004000989	Intermittent stream
U600	White Pine Fork Creek	16030004003840	Perennial stream
U600	Cottonwood Creek	16030004000069	Perennial stream
SOURCES: U.S. Geological Survey 2010a NOTE: HUC = Hydrologic Unit Code			

Palustrine Forested Wetlands

Forested wetlands are scarce in the Project area. These specially designated waters have been identified in two locations where the alternative route reference centerline crosses the Green River at Links U390 and U400.

Wetlands and Riparian Areas

Wetlands and riparian areas were grouped together for analytical purposes based on the relative uniqueness of these resources across the landscape and similarity of their susceptibility to impacts. Wetlands and riparian areas crossed by alternative routes include Palustrine systems derived from the NWI database and riparian areas derived from the SWReGAP database. A total of 248 Palustrine systems and 593 riparian areas are crossed or are within 300 feet of alternative routes of the Proposed Action. Those wetlands and riparian areas crossed by the Project centerline are summarized in Table 3-40.

TABLE 3-40
WETLANDS AND RIPARIAN AREAS CROSSED BY ALTERNATIVE ROUTES

Subbasin (Hydrologic Unit Code)	Link(s)	Cowardin Code	Cowardin Name
Upper North Platte (10180002)	W21, W30	PEMC	Palustrine, Emergent, Seasonally Flooded
Upper North Platte (10180002)	W35	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Upper North Platte (10180002)	W35	PEMFh	Palustrine, Emergent, Semipermanently Flooded, Diked/impounded
Pathfinder-Seminoe Reservoirs (10180003)	W22	PEMA	Palustrine, Emergent, Temporarily Flooded
Pathfinder-Seminoe Reservoirs (10180003)	W22	PEMAh	Palustrine, Emergent, Temporarily Flooded, Diked/impounded
Pathfinder-Seminoe Reservoirs (10180003)	W22	PEMC	Palustrine, Emergent, Seasonally Flooded
Medicine Bow (10180004)	W22	PEMA	Palustrine, Emergent, Temporarily Flooded
Medicine Bow (10180004)	W21, W22	PEMB	Palustrine, Emergent, Saturated
Medicine Bow (10180004)	W21	PEMC	Palustrine, Emergent, Seasonally Flooded
Medicine Bow (10180004)	W21	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Medicine Bow (10180004)	W22	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Colorado Headwaters-Plateau (14010005)	C197	PEMC	Palustrine, Emergent, Seasonally Flooded
Colorado Headwaters-Plateau (14010005)	C197	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Westwater Canyon (14030001)	U490	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Great Divide Closed Basin (14040200)	W32	PABF	Palustrine, Aquatic Bed, Semipermanently Flooded
Great Divide Closed Basin (14040200)	W32	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Great Divide Closed Basin (14040200)	W102, W108, W32	PEMA	Palustrine, Emergent, Temporarily Flooded
Great Divide Closed Basin (14040200)	W101	PEMC	Palustrine, Emergent, Seasonally Flooded
Great Divide Closed Basin (14040200)	W125, W32	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Great Divide Closed Basin (14040200)	W125	PUSAx	Palustrine, Unconsolidated Shore, Temporarily Flooded, Excavated
Lower Yampa (14050002)	C106	PEMC	Palustrine, Emergent, Seasonally Flooded
Lower Yampa (14050002)	C106	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Little Snake (14050003)	W124	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Little Snake (14050003)	W113	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Muddy (14050004)	W110, W111	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed

TABLE 3-40 WETLANDS AND RIPARIAN AREAS CROSSED BY ALTERNATIVE ROUTES			
Subbasin (Hydrologic Unit Code)	**Link(s)**	**Cowardin Code**	**Cowardin Name**
Muddy (14050004)	W116	PEMA	Palustrine, Emergent, Temporarily Flooded
Muddy (14050004)	W120	PEMC	Palustrine, Emergent, Seasonally Flooded
Muddy (14050004)	W120	PUBFx	Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated
Muddy (14050004)	W102, W110, W113	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Muddy (14050004)	W110, W111	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Lower White (14050007)	U242, C196, C177	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Lower White (14050007)	C186	PEMA	Palustrine, Emergent, Temporarily Flooded
Lower White (14050007)	C177, C175, C196	PEMAh	Palustrine, Emergent, Temporarily Flooded, Diked/impounded
Lower White (14050007)	C177	PEMC	Palustrine, Emergent, Seasonally Flooded
Lower White (14050007)	C195	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Lower White (14050007)	C177, C196, C186, C175	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Lower White (14050007)	C177	PEMF	Palustrine, Emergent, Semipermanently Flooded
Lower White (14050007)	C177	PEMFh	Palustrine, Emergent, Semipermanently Flooded, Diked/impounded
Lower White (14050007)	C177, U242	PSSAh	Palustrine, Scrub-Shrub, Temporarily Flooded, Diked/impounded
Lower White (14050007)	C175, C177, C195, U242	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Lower White (14050007)	C195, U242	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Lower Green-Diamond (14060001)	U241	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Lower Green-Diamond (14060001)	U391	PEMA	Palustrine, Emergent, Temporarily Flooded
Lower Green-Diamond (14060001)	U241	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Lower Green-Diamond (14060001)	U390	PFOA	Palustrine, Forested, Temporarily Flooded
Duchesne (14060003)	U420	PABF	Palustrine, Aquatic Bed, Semipermanently Flooded
Duchesne (14060003)	U420, U410, U431	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Duchesne (14060003)	U410	PABKx	Palustrine, Aquatic Bed, Artificially Flooded, Excavated
Duchesne (14060003)	U410, U420, U430, U431	PEMA	Palustrine, Emergent, Temporarily Flooded
Duchesne (14060003)	U420, U410, U431	PEMB	Palustrine, Emergent, Saturated
Duchesne (14060003)	U420, U410, U431	PEMC	Palustrine, Emergent, Seasonally Flooded
Duchesne (14060003)	U410	PEMCx	Palustrine, Emergent, Seasonally Flooded, Excavated

TABLE 3-40
WETLANDS AND RIPARIAN AREAS CROSSED BY ALTERNATIVE ROUTES

Subbasin (Hydrologic Unit Code)	Link(s)	Cowardin Code	Cowardin Name
Duchesne (14060003)	U420, U410, U430	PEMF	Palustrine, Emergent, Semipermanently Flooded
Duchesne (14060003)	U410, U420, U430, U431	PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
Duchesne (14060003)	U430	PSSB	Palustrine, Scrub-Shrub, Saturated
Duchesne (14060003)	U430	PUBFx	Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated
Duchesne (14060003)	U431	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Duchesne (14060003)	U431	PUSAx	Palustrine, Unconsolidated Shore, Temporarily Flooded, Excavated
Duchesne (14060003)	U410, U420	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Duchesne (14060003)	U410	PUSCx	Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated
Strawberry (14060004)	U426	PABF	Palustrine, Aquatic Bed, Semipermanently Flooded
Strawberry (14060004)	U420	PABFh	Palustrine, Aquatic Bed, Semipermanently Flooded, Farmed
Strawberry (14060004)	U427	PABGb	Palustrine, Aquatic Bed, Intermittently Flooded, Beaver
Strawberry (14060004)	U426	PEMA	Palustrine, Emergent, Temporarily Flooded
Strawberry (14060004)	U427	PEMB	Palustrine, Emergent, Saturated
Strawberry (14060004)	U427	PEMBb	Palustrine, Emergent, Saturated, Beaver
Strawberry (14060004)	U426	PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
Strawberry (14060004)	U426	PUBFx	Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated
Strawberry (14060004)	U420, U425, U426, U427	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Strawberry (14060004)	U421	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
Lower Green-Desolation Canyon (14060005)	U406	PABF	Palustrine, Aquatic Bed, Semipermanently Flooded
Lower Green-Desolation Canyon (14060005)	U432	PABGb	Palustrine, Aquatic Bed, Intermittently Flooded, Beaver
Lower Green-Desolation Canyon (14060005)	U406	PEMB	Palustrine, Emergent, Saturated
Lower Green-Desolation Canyon (14060005)	U404	PEMC	Palustrine, Emergent, Seasonally Flooded
Lower Green-Desolation Canyon (14060005)	U400, U432	PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
Lower Green-Desolation Canyon (14060005)	U432	PSSBb	Palustrine, Scrub-Shrub, Saturated, Beaver
Willow (14060006)	U300	PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
Price (14060007)	U489	PEMCh	Palustrine, Emergent, Seasonally Flooded, Diked/impounded
Price (14060007)	U495, U530	PSSA	Palustrine, Scrub-Shrub, Temporarily Flooded
Price (14060007)	U489	PUBFx	Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated

TABLE 3-40 WETLANDS AND RIPARIAN AREAS CROSSED BY ALTERNATIVE ROUTES			
Subbasin (Hydrologic Unit Code)	**Link(s)**	**Cowardin Code**	**Cowardin Name**
Price (14060007)	U492, U524, U544, U548	PUSAh	Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/impounded
Price (14060007)	U489	PUSAx	Palustrine, Unconsolidated Shore, Temporarily Flooded, Excavated
Price (14060007)	U523, U545	PUSCh	Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded
SOURCES: National Wetlands Inventory (U.S. Fish and Wildlife Service 2012a); Southwest Region Gap Analysis Project Dataset (U.S. Geological Survey 2010c)			

Lentic and Lotic Waters

Lentic and lotic waters constitute the majority of surface-water resources occurring in the Project area. Water resources grouped into this category include riverine systems (rivers, streams, canals, ditches); limnetic subsystems (lakes, ponds, reservoirs); and springs and wells and are widespread throughout the Project area.

Lentic Waters

The HUC and NHD represent the geographic location of lentic waters in the Project area. The alternative routes considered for the Proposed Action cross 8 named lentic waters and 116 unnamed lentic waters. Table 3-41 summarizes the named lentic waters crossed by the alternative routes and route variations.

TABLE 3-41 NAMED LENTIC WATERS CROSSED BY ALTERNATIVE ROUTES	
Subbasin (Hydrologic Unit Code)	**Waterbody Name**
Lower Yampa (14050002)	Culverwell Reservoir
Little Snake (14050003)	R O W Reservoir Clay Flat Reservoir
Muddy (14050004)	Duck Lake
Lower White (14050007)	Villard Flats Reservoir Box Elder Reservoir Number 2 Box Elder Reservoir
Lower Green-Desolation Canyon (14060005)	Sky-high Pond
SOURCE: U.S. Geological Survey 2010a	

Lotic Waters

The alternative routes and route variations considered for the Project cross a total of 1,023 perennial lotic waters and 2,099 intermittent or ephemeral waters. Table 3-42 summarizes the named perennial and intermittent lotic waters crossed by alternative routes and route variations considered for the Project.

TABLE 3-42
NAMED LOTIC WATERS CROSSED BY ALTERNATIVE ROUTES

Perennial Streams[1]	Intermittent Streams	
Upper North Platte Subbasin (HUC 10180002)		
North Platte River[3]	Coal Creek Saint Mary's Creek Sugar Creek	
Pathfinder-Seminoe Reservoirs Subbasin (HUC 10180003)		
None	Big Ditch Jim Creek Sandpipe Draw	
Medicine Bow Subbasin (HUC 10180004)		
Medicine Bow River	Pine Draw South Pine Draw	
Westwater Canyon Subbasin (HUC 14030001)		
Sagers Wash	Bitter Creek Bootlegger Wash Bryson Wash Cisco Wash Coal Draw Cottonwood Wash[2]	Danish Wash Pinto Wash Sagers Wash Saleratus Wash Westwater Creek[2]
Upper Colorado-Kane Springs Subbasin (HUC 14030005)		
None	Salt Wash	
Great Divide Closed Basin Subbasin (HUC 14040200)		
None	Coal Bank Wash Echo Springs Draw Fillmore Creek Government Res. Outlet Horse Pasture Draw Separation Creek Standard Draw	
Upper Yampa Subbasin (HUC 14050001)		
Elkhead Creek Fortification Creek[2] Little Bear Creek Little Cottonwood Creek SF Fortification Creek Yampa River[2]	Basin Res. Outlet Bogenschutz Creek Cole Gulch Deacon Gulch Dry Cottonwood Creek Elkhorn Ditch	Flume Gulch Johnson Gulch Long Gulch NF Fortification Creek Wymore Gulch
Lower Yampa Subbasin (HUC 14050002)		
Yampa River[2]	Cedar Springs Draw Deception Creek Horse Gulch Mud Springs Gulch Twelvemile Gulch	

TABLE 3-42
NAMED LOTIC WATERS CROSSED BY ALTERNATIVE ROUTES

Perennial Streams[1]	Intermittent Streams	
Little Snake Subbasin (HUC 14050003)		
Little Snake River	Cedar Breaks Draw Cherokee Draw Colloid Draw Clay Flats Res. Outlet Devils Canyon East Fork Cherokee Creek Gibson Blair Ditch Gledhill Draw Hartt Cabin Draw Mud Spring Draw Pole Gulch Powder Wash	Reader Cabin Draw Red Creek ROW Res. Outlet Sand Creek Simsberry Draw Spence Gulch Timberlake Creek Van Fleet Draw W Branch Willow Creek WF Cherokee Creek West Side Canal Willow Creek
Muddy Subbasin (HUC 14050004)		
Muddy Creek[2]	Antelope Creek Barrel Springs Draw Blue Gap Draw Coal Gulch Cottonwood Creek Little Coal Gulch Little Robbers Gulch N Barrel Springs Draw	NF Cottonwood Creek Red Wash Robbers Gulch Soap Hole Wash S Barrel Springs Draw Strecktus Draw Windmill Draw
Lower White Subbasin (HUC 14050007)		
Douglas Creek Red Wash[2] Whiskey Creek[2] White River[2]	Antelope Draw Big Horse Draw Box Elder Creek[2] Coyote Wash Davis Canyon Dripping Rock Creek EF Wolf Creek[2] East Twin Wash Elk Springs Draw Evacuation Creek[2] Gillam Draw Horse Draw Kennedy Wash Little Gilliam Draw Little Whiskey Creek[2]	MF Wolf Creek[2] Miller Creek[2] Missouri Creek[2] Park Canyon Red Wash[2] Sand Wash Skull Creek[2] Stinking Water Creek Taylor Draw Texas Creek[2] Three Springs Draw Trail Draw West Twin Wash Whiskey Creek Willow Creek Wolf Creek[2]
Lower Green-Diamond Subbasin (HUC 14060001)		
Green River	Baser Wash Ouray Valley Canal Powder Springs Wash Snake John Wash	

TABLE 3-42
NAMED LOTIC WATERS CROSSED BY ALTERNATIVE ROUTES

Perennial Streams[1]	Intermittent Streams	
Duchesne Subbasin (HUC 14060003)		
Big Sand Wash	Benson Draw	Moon Lake Canal[2]
Dry Gulch Creek[2]	Big Sand Wash	N Lost Hollow[3]
Duchesne River[4]	Broad Hollow[3]	North Lateral C Canal[2]
Lake Fork River[2]	Clem Hollow[3]	Ouray Park Canal
Montes Creek[2]	Cobble Hollow	Pickup Wash
Lateral No. 5	Cottonwood Wash	Quitchampau Canyon[3]
Montes Creek	Dry Gulch	Red Cap Canal
Sowers Creek[2]	Duchesne Feeder Canal	S Lateral C Canal
Uinta River[2]	Jolie Hollow[3]	S Lost Hollow[3]
	Lake Fork Lateral Canal	Sowers Creek[3]
	Lateral C Canal	Trail Hollow[3]
	Lateral No. 5[2]	Trapper Canyon[3]
	Midview Ditch[2]	Wire Fence Canyon[3]
	Mine Hollow[3]	Zimmerman Wash
Strawberry Subbasin (HUC 14060004)		
Currant Creek[2]	Buffalo Canyon[3]	
Duchesne River	Center Canyon[3]	
Red Creek[2]	French Hollow[3]	
Strawberry River[4]	Rabbit Gulch	
	Saleratus Wash	
	Sand Wash	
	Sink Draw	
	Trail Hollow[3]	
Lower Green-Desolation Canyon Subbasin (HUC 14060005)		
Argyle Creek	Bear Canyon	Leers Canyon
Green River	Big Sulphur Canyon	Lion Canyon
Minnie Maud Creek	Canyon Wash	North Corral Canyon
Summit Creek	Desert Spring Wash	Petes Wash
	Dry Canyon	Wash Canyon
	Four Mile Wash	Wood Canyon
Colorado Headwaters-Plateau Subbasin (HUC 14060005)		
None	McDonald Creek	
	Prairie Canyon	
	Wagon Canyon	
	West Salt Creek	
Willow Subbasin (HUC 14060006)		
Willow Creek	None	

TABLE 3-42
NAMED LOTIC WATERS CROSSED BY ALTERNATIVE ROUTES

Perennial Streams[1]		Intermittent Streams	
Price Subbasin (HUC 14060007)			
Bear Creek[2]	Miller Creek[2]	Bear Creek[2]	Icelander Creek[2]
Beaver Creek[2]	Mud Creek[2]	Boarding House Canyon[3]	Jackass Wash
Boarding House Canyon	Mud Water Canyon	Cat Canyon	Magazine Canyon
Bob Wright Canyon	NF Gordon Creek[2]	Clearwater Creek	Marsh Flats Wash
Coal Creek	Price River[4]	Coleman Wash	North Spring Canyon
Cottonwood Wash	RF Kyune Creek	Consumers Wash	Panther Canyon
Deep Canyon	Soldier Creek	Drop Wash	Pole Canyon
Gooseberry Creek[4]	Summit Creek	Dry Canyon	Potter Wash
Horse Creek[2]	Tabbyune Creek[2]	Dry Fork[2]	Sand Wash
Jack Canyon	Trail Canyon	Garley Canyon	Serviceberry Creek[2]
Kyune Creek[2]	West Fork Willow Creek	Grassy Trail Creek[2]	Spring Canyon
Marsing Wash	White River[2]	Haley Canyon	Timothy Wash
Mathis Canyon	Willow Creek[2]	Hardscramble Canyon	Twin Peaks Wash
		Hoffman Creek	Washboard Wash
		Horse Creek[2]	WF Willow Creek[2]
			Woods Canyon
Lower Green Subbasin (HUC 14060008)			
Floy Wash		Big Hole Wash	
Green River		Blaze Canyon	
Thompson Wash		Corral Wash	
		Cottonwood Wash	
		Crescent Wash	
		Crooked Wash	
		Solitude Wash	
San Rafael Subbasin (HUC 14060009)			
Cedar Creek[2]		Booths Canyon[3]	Fivemile Wash
Deer Creek[4]		Buckhorn Wash	Furniture Canyon
Huntington Creek[2]		Burnout Canyon[3]	Guymon Wash
Indian Creek[4]		Calf Canyon	Mammoth Creek[2]
Upper Huntington Creek[4]		Cedar Creek	Maple Gulch[3]
		Chris Otenson Hollow	Mariunus Canyon[3]
		Cottonwood Creek[4]	Swens Canyon[3]
		Cow Canyon	Whetstone Creek[4]
		Dry Canyon[3]	Wilberg Wash
Utah Lake Subbasin (HUC 16020201)			
Currant Creek		Currant Creek	
Hop Creek		Forbs Canyon[3]	
Water Hollow		Old Canyon	
West Creek		Rocky Ridge Canyon[3]	
		Salt Creek	
		Salt Spring Canyon[3]	
		West Creek	

TABLE 3-42 NAMED LOTIC WATERS CROSSED BY ALTERNATIVE ROUTES		
Perennial Streams[1]	**Intermittent Streams**	
Spanish Fork Subbasin (HUC 16020202)		
Blind Canyon[3] Indian Creek[3] Lake Fork Creek LF Spencer Creek[3] Sheep Creek[3] Soldier Creek[2] Thistle Creek[2] Tie Fork[3]	Cox Canyon[3] Garner Canyon[3] Heslington Canyon[3] Hicks Canyon[3] RF Timber Canyon[3] Sheep Creek[3] Soldier Creek[2] Tank Hollow[3] Water Hollow[3] Wildcat Canyon	
San Pitch Subbasin (HUC 16030004)		
Coal Fork Cottonwood Creek[3] Pleasant Creek San Pitch River White Pine Fork	Big Hollow Cottonwood Hollow Dublin Wash Indian Hollow Little North Creek Maple Fork Creek[3]	NF Mud Springs Wash North Creek Serviceberry Hollow Spring Hollow Wood Hollow White Pine Fork Creek[3]

SOURCE: U.S. Geological Survey 2010a
NOTES:
[1]The National Hydrography Dataset indicates that some streams consist of both perennial and intermittent reaches
[2]Impaired Waters
[3]Outstanding Waters
[4]Stream has impaired and outstanding reaches listed
HUC = Hydrologic Unit Code

Springs and Wells

There are 17 springs and 2 wells located within 300 feet of the alternative routes considered for the Project (Table 3-43) (USGS 2010a). No springs or wells are crossed by any alternative routes.

TABLE 3-43
SPRINGS AND WELLS WITHIN 300 FEET OF ALTERNATIVE ROUTES

Subbasin (Hydrologic Unit Code)	Link	Distance from Route Centerline (feet)	Water Type (Spring/Well)
Upper Yampa (14050001)	C105	16	Spring
Upper Yampa (14050001)	C13	43	Spring
Upper Yampa (14050001)	C13	245	Spring
Upper Yampa (14050001)	C13	293	Spring
Little Snake (14050003)	C91	94	Spring
Muddy (14050004)	W128	140	Well
Duchesne (14060003)	U431	153	Well
Duchesne (14060003)	U430	215	Spring
Price (14060007)	U530	112	Spring
Price (14060007)	U489	224	Spring
Price (14060007)	U530	281	Spring
Lower Green (14060008)	U730	220	Spring
San Rafael (14060009)	U629	254	Spring
San Rafael (14060009)	U629	295	Spring
Utah Lake (16020201)	U650	212	Spring
Utah Lake (16020201)	U650	250	Spring

TABLE 3-43 SPRINGS AND WELLS WITHIN 300 FEET OF ALTERNATIVE ROUTES			
Subbasin (Hydrologic Unit Code)	**Link**	**Distance from Route Centerline (feet)**	**Water Type (Spring/Well)**
Spanish Fork (16020202)	U539	109	Spring
Spanish Fork (16020202)	U433	135	Spring
Spanish Fork (16020202)	U621	288	Spring
SOURCES: National Hydrography Dataset (U.S. Geological Survey 2010a), Southwest Region Gap Analysis Project Dataset (U.S. Geological Survey 2010c)			

All water resources occurring outside of the BLM Rawlins Field Office within 300 feet of an alternative route reference centerline were inventoried and included in the impact assessment. This inventory area was identified in coordination with the Agency Interdisciplinary Team and cooperating agency representatives and is based off the most conservative avoidance buffer mandated by a cooperating agency in the Project Area; the Utah BLM Riparian Policy (BLM 2010a). In addition, all water resources occurring on land in the BLM Rawlins Field Office identified in the 100-year floodplain and within 500 feet of an alternative route reference centerline were inventoried and included in the impact assessment. These waters were identified by the BLM Rawlins Field Office based on the requirements in the RMP (Section 2.3.16, Management Action 5) (BLM 2008b).

3.2.4.4.2 Impact Assessment and Mitigation Planning

The methodology for assessing potential impacts on water resources associated with implementation of the Project includes:

- Identifying particular sensitivity, abundance, and value of inventoried water resources using USACE- and EPA-approved methods and standards;
- Identifying types of potential effects on water resources that could result from construction, operation, and maintenance of the Project;
- Developing criteria for assessing the level of potential effect on water resources;
- Determining initial impacts on water resources;
- Identifying appropriate design features of the Proposed Action (Table 2-8) to minimize potential adverse effects;
- Determining where selective mitigation measures should be applied; and
- Disclosing potential residual impacts on water resources.

Types of Potential Environmental Effects

No direct impacts on water quantity would be anticipated because there would be no direct removal of water for construction, operation, and maintenance of the Project beyond what is currently being used either by municipalities or existing water rights. Section 2.4.5.3 discusses water use for the Project. The potential exists that actions related to the construction, operation, and maintenance of the Project could result in direct impacts on water quality.

Direct impacts on water resources from implementation of the Project could result from ground-disturbing activities associated with construction of Project facilities including access roads, tower pads, and ancillary facilities. Construction of permanent and temporary access roads may require crossing wetlands and riparian areas, as well as lentic and lotic waters, which could require temporary removal of riparian vegetation, grading of stream banks, and/or the placement of fill such as washed rock, native substrate, bridge pilings, culverts, wing walls, etc. into a waterbody to support a bridge or other stream crossing structure. Modification of water resources (i.e., channelization of stream channels, removal of wetland and riparian vegetation, dredging of bed materials, temporary diversions, or impoundments)

could be required for Project construction, operation, or maintenance but any such activity would be avoided unless constructability standards preclude such avoidance. Project facilities or access roads crossing a waterbody would be constructed within the minimum footprint required to safely and effectively conduct construction activities while maintaining water conveyance and riparian, stream bed, and stream bank stability. Improving existing roads and crossings would require application of stabilization measures to maintain Project conformance with state and federal water quality standards not currently implemented or required along existing roads.

Where Project facilities requiring ground-disturbing activities cannot be avoided in proximity to water resources, there is potential for adverse, short-term, indirect effects on water resources. Indirect effects could include an increased potential for erosion caused sedimentation to be discharged into a waterbody from destabilization of soils in riparian areas, removal of vegetation, and modification of stream geomorphology. Design features of the Proposed Action, selective mitigation measures, and additional site-specific design features would mitigate, reduce, or eliminate the potential for these activities to result in short-term indirect adverse effects on water resources. Long-term, indirect effects are not likely to occur following stabilization of areas disturbed by construction activities.

Indirect beneficial effects on water resources could also result from development of the Project. Where applicable, existing roads would be utilized and improved to safely and effectively transport building materials and construction equipment from between construction sites. Where existing roads are used for Project development rather than constructing new access roads, comparative surface disturbance, and subsequent indirect impacts on water resources would be reduced. Existing stream crossings likely would need to be upgraded to accommodate larger vehicles. Improvements to crossing structures would be done in a manner that, in the short-term could result in minor discharges of sediment but, in the long-term, could reduce impacts from non-Project related traffic.

The CWA requires that any work performed within the bed and banks and below the plane of the ordinary high water mark (direct impacts) in any waters determined to be waters of the U.S. including wetlands (33 CFR 328.3) would require USACE authorization under 33 CFR 404. Dredge or fill in waters of the U.S. requires mitigation of impacts which can range from pre-construction avoidance and minimization during the design phase to mitigation for the permanent loss of waters of the U.S. Mitigation requirements for potential Project impacts on waters of the U.S. are addressed through design features of the Proposed Action, which specifies that impacts on water resources are avoided or minimized to the extent practicable. Unavoidable impacts over an allowable threshold specified by the CWA permits required for the Project would be offset by additional mitigation. Impacts resulting from permanent crossings would be limited to new roads constructed through or over water resources, improvements to existing crossings, and modification of riparian vegetation to meet safety standards.

Additionally, potential impacts on state-listed or outstanding waters should be differentiated from impacts on nonlisted waters and waters not classified as outstanding. Of the 20 waters on the CWA Section 303(d) list of impaired waters inventoried in the study corridor, 9 have an EPA-approved TMDL limitation designated for the source or sources of impairment. If the Project, for any reason, causes the discharge of materials to these waters and contributes to the maximum-allowable TMDL, such as the discharge of sediment from erosion, fugitive dust, or incidental fallback to an impaired water listed for sediment or total dissolved solids; the Project would then be in violation of that TMDL and Sections 319, 401, and 402 of the CWA.

Outstanding waters are also protected under the National Antidegradation Policy by each state with additional avoidance buffers and stipulations that differentiate them from the standard CWA provisions. Stipulations are defined by the appropriate State Department of Environmental Quality.

Temporary stream crossings would be used either to cross water resources with little to no stream flow or would only be needed for the construction phase of the Project. Types of temporary stream crossings may include (1) dry crossings with no bank or channel improvement, (2) dry crossings requiring mechanically grading banks to a slope sufficient to drive equipment and building materials across the, (3) placement of temporary fill such as washed rock, log bunks, culverts, etc. that would be removed following the completion of work requiring the crossing, or (4) temporary span structures; while temporary, these crossings would have the potential to affect riparian and in-stream stability. The erosion and sedimentation potential would increase as a parallel function of the type, duration, and spatial extent of surface-disturbance. Depending on the type of stream crossing method used, it may be necessary to obtain a stream alteration permit from the state and/or a Section 404 CWA permit from the USACE. Temporary modifications of channel morphology would be re-graded to as close to preconstruction contours as possible once the temporary crossing is decommissioned. Permanent stabilization measures would be implemented in conformance with state and federal water quality regulations.

Additional indirect impacts would be due to ground-disturbing activities such as clearing, grubbing, and blading to remove vegetation for safe workspaces. These activities would mobilize fugitive dust and destabilize soils in some places. Mobilization of fugitive dust and erosion may result in the discharge of sediment to water resources. Increased sedimentation indirectly related to ground-disturbing activities potentially could degrade the functional capacity of water resources including wetlands and riparian areas by discharging higher rates of sediment into the system than can be attenuated, filtered, and/or immobilized under normal circumstances. These effects would only be seen where unexpected circumstance such as dramatic or non-typical climactic events compromise the integrity and functionality of erosion control design features or where design features are not properly installed and maintained.

Other indirect impacts on water resources could be attributed to accidental spills of environmentally harmful substances such as petroleum products, concrete waste, herbicides/pesticides, or incidental stabilization of native materials. Indirect impacts on springs would be similar to those described for perennial lentic and lotic waters, and impacts on wells could include accidental physical damage to well structures during construction. Another potential indirect impact could be attributed to accidental introduction of aquatic invasive species. Following design features of the Proposed Action, implementation of selective mitigation measures, and application of additional site-specific mitigation, potential indirect impacts on water resources could be completely mitigated.

Effects Analysis

Resource Vulnerability

The level of a potential impact on water resources was assigned based on the overall vulnerability of a water resource to ground-disturbing activities. Resource vulnerability was categorized as high, moderate, or low, depending on a resource's (1) value to the landscape (2) sensitivity to impacts; (3) quality and functional capacity as a component of the environment; and (4) abundance, distribution, and range in the Project area. Table 3-44 illustrates the resource vulnerability model developed for water resources.

TABLE 3-44
WATER RESOURCE VULNERABILITY MODEL

Water Resource (Data Sources)	Potential Resource Vulnerability				Overall Vulnerability
	Resource Value	Resource Sensitivity	Resource Quality	Resource Quantity	
Specially Designated Waters					
Palustrine Forested Wetlands	High	High	High	Low	High
Outstanding Waters	High	High	High	Low	High
Impaired Waters	High	High	Low	Low	High

TABLE 3-44 WATER RESOURCE VULNERABILITY MODEL					
	Potential Resource Vulnerability				
Water Resource (Data Sources)	Resource Value	Resource Sensitivity	Resource Quality	Resource Quantity	Overall Vulnerability
Wetlands and Riparian Areas					
Palustrine Scrub-Shrub Wetlands	Moderate	Moderate	Moderate	Moderate	Moderate
Palustrine Emergent Wetlands	Moderate	Low	Moderate	Moderate	Moderate
Swamp, Marsh, Estuary	Moderate	Moderate	Moderate	Low	Moderate
Riparian Areas	Moderate	Moderate	Moderate	Low	Moderate
Lentic and Lotic Waters					
Perennial Stream/River	Moderate	Moderate	Moderate	Moderate	Moderate
Well/Spring	Moderate	Moderate	Moderate	Moderate	Moderate
Lake, Reservoir, Pond	Moderate	Low	Moderate	Moderate	Moderate
Intermittent Stream	Moderate	Moderate	Low	High	Moderate
Canal Ditch	Low	Low	Low	High	Low
Ephemeral Stream/Wash	Low	Low	Low	High	Low
SOURCES: Impaired Waters: (Environmental Protection Agency 2012a, b, c); Outstanding Waters: Utah and Wyoming Wetlands: National Wetlands Inventory Dataset (U.S. Fish and Wildlife Service 2012a); Riparian Areas: Southwest Regional Gap land-cover dataset (U.S. Geological Survey 2010c); Lentic and Lotic Waters: National Hydrography Dataset (U.S. Geological Survey 2010a).					

Criteria for Assessing Level of Impacts

Criteria were developed to assess the level of potential impacts (both initial and residual) on water resources associated with the Project (Table 3-45). These criteria focused on the abundance of a particular water resource in the region; the vulnerability of that resource; the time in which, if affected, those resources would return to pre-disturbance conditions; the potential for permanent loss of water resource components such as riparian and wetland vegetation; federal and state statutes applicable to water resources; and the varying degree of importance a water resource has to the greater ecosystem.

TABLE 3-45 CRITERIA FOR ASSESSING LEVEL OF INITIAL IMPACTS ON WATER RESOURCES	
Level of Impact	**Description**
High	▪ Permanent loss of Palustrine Forested Wetlands ▪ Permanent loss of greater than 0.5 acre of any wetland or water of the United States ▪ Deposition of materials into Sections 303(d) or 305(b)-listed impaired waters ▪ Deposition of materials into state-listed Class 1: Outstanding Waters ▪ Modification of natural springs or existing wells
Moderate	▪ Permanent loss of Palustrine Scrub-Shrub Wetlands ▪ Permanent loss of greater than 0.1 acre of any wetland or water of the United States ▪ Permanent increase of sedimentation to water resources
Low	▪ Permanent loss of Palustrine Emergent Wetlands ▪ Temporary loss of Palustrine Scrub-Shrub Wetlands ▪ Temporary dredge/fill in waters of the United States ▪ Temporary increases in sedimentation to nearby water resources
No Identifiable	▪ Temporary impacts on water resources within the range of natural variability under normal circumstances

Assessment of Initial Impacts

Water resources are primarily affected by sedimentation from ground-disturbing activities, such as construction of access roads, ancillary facilities, and tower structures. An access model was used (Sections 2.5.1.2) to estimate potential ground disturbance per alternative route. Table 2-10 illustrates the

access levels modeled for the Project, as well as the estimated area of disturbance for each access level. Table 2-11 presents the estimated ground disturbance for each alternative route and route variation.

Initial impacts resulting from construction, operation, and maintenance of the Project include high, moderate, low, and no identifiable impacts. These impact levels are derived by comparing each water resource and its corresponding vulnerability to impacts (Table 3-44) in conjunction with the level of impact expected from Project-related disturbance (Table 3-45). For purposes of the analysis and consistency between resources, initial impacts are expected to result in the same level of impact on water resources crossed by reference centerline as those which occur within the geographic scope of analysis (300 feet on either side of reference centerline).

Mitigation Planning and Effectiveness

In addition to design features of the Proposed Action described as part of the Project description in Chapter 2 (Table 2-8); selective mitigation measures were developed to minimize adverse impacts on water resources. Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13 would be applied where applicable and feasible based on the Project description, to reduce the effects of ground-disturbing activities on water resources.

- **Selective Mitigation Measure 1 (avoid disturbance to sensitive soils and vegetation).** Existing access roads/trails would not be widened or otherwise upgraded for construction and maintenance in areas where soils and vegetation are particularly sensitive to disturbance, except in areas where repairs are necessary to make existing roads/trails passable and safe as determined by the land-management agency. Avoiding unnecessary access road upgrades within 300 feet of outstanding waters, impaired waters, perennial streams, and intermittent streams would limit the amount of surface disturbance. Limiting ground disturbance in proximity to lotic waters would reduce the potential for indirect effects such as increased potential for erosion and sediment transport from soil compaction/decompaction and loss of soil stabilizing vegetation.
- **Selective Mitigation Measure 2 (sensitive resource avoidance).** Access roads would be designed to avoid placement of permanent fill in all three categories of water resources. Avoiding water resources would (1) reduce the need for removing riparian and/or wetland vegetation, (2) decrease soil erosion and sedimentation, and (3) maintain the functional capacity of water resources to filter sediments and nutrients and attenuate damaging flood flows. Where construction vehicles and equipment would need to access areas within the 300-foot water resource avoidance buffer, potential impacts would be avoided in the design stage and anticipated impacts would be adequately mitigated. In addition, an erosion control plan would be implemented to minimize the potential for sedimentation. Spill prevention and containment measures would be implemented, and vehicle refueling and maintenance activities would be limited to designated work areas at least 300 feet from all water resources.
- **Selective Mitigation Measure 3 (minimize slope cut and fill).** The alignment of any new access roads or cross-country routes in designated areas would follow the landform contours where practicable to minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, providing that such alignment does not impact other resource values. Following the existing land contours and terrain, particularly in steep terrain, minimizes the cutting and filling of slopes where water resources are particularly sensitive to surface disturbance.
- **Selective Mitigation Measure 4 (minimize tree clearing).** Tree clearing would be minimized to within 300 feet of specially designated waters, as well as lentic and lotic systems with a forested riparian component or where timber is present on steep slopes above water resources. Minimizing tree clearing on steep slopes would provide beneficial effects on water resources. Trees left

standing protect soils from erosion and reduce the amount of sediment being transferred down-slope and eventually into waters.

- **Selective Mitigation Measure 5 (minimize new or improved accessibility).** To limit new or improved access into the Project area, all new or improved access (e.g., blading, widening existing access) not required for maintenance would be closed or rehabilitated using the most effective and least environmentally damaging methods appropriate and developed through consultation with the landowner or land-management agency. This mitigation measure would be employed around lotic waters, riparian areas, and specially designated waters.
- **Selective Mitigation Measure 7 (span and/or avoid sensitive features).** Potential impacts on water resources would be minimized by locating tower structures so as to avoid sensitive features such as wetlands, riparian areas, springs, wells, and perennial lentic and lotic systems. Application of this mitigation measure would reduce soil destabilization and soil compaction near sensitive water resources, which would result in less construction-related erosion and downstream sedimentation.
- **Selective Mitigation Measure 11 (minimize right-of-way clearing).** Clearing of the right-of-way would be minimized to avoid sensitive features that include forested wetlands, mature riparian areas, scrub-shrub wetlands, and perennial and intermittent streams. In select areas, the right-of-way width may be modified (within the limits of PacifiCorp Vegetation Management Standards and standard tower design) to protect sensitive water resources. Limiting the width of the area cleared in the right-of-way reduces the amount of vegetation (i.e., trees) removed at the edges of and within the right-of-way, minimizing the potential for erosion and subsequent sedimentation to receiving waters.
- **Selective Mitigation Measure 13 (overland access).** The Construction Contractor would use overland access to the greatest extent possible in areas where no grading would be needed to access work areas. Overland access would consist of drive-and-crush and/or clear-and-cut travel, and would avoid or minimize the removal of surface soil and vegetation, reducing the potential for erosion and sedimentation from loss of vegetation and soil disturbance. In addition, avoiding the construction of a new road would reduce the potential for increased traffic and the associated indirect effects.

Residual Impacts

Residual impacts were assessed for potentially affected specially designated waters, wetlands and riparian areas, lentic and lotic waters, springs, and wells. Water resources directly crossed by an alternative route reference centerline are reported separate from water resources that are not crossed by an alternative route reference centerline, but which occur within the geographic scope of analysis (300 feet on either side of the reference centerline except within the BLM Rawlins Field Office where water resources are reported within 500 feet of the alternative route reference centerlines). This distinction is made because it is anticipated that the intensity of residual impacts would be greater closer to a water resource and vice versa.

Table 3-46 summarizes the anticipated initial and residual impact on the water resources being analyzed by category. Initial impacts are based on resource vulnerability to potential impacts and implementation of design features of the Proposed Action. Residual impacts are a function of properly implemented selective mitigation measures applied to minimize potentially adverse effects on those resources.

TABLE 3-46
SUMMARY OF INITIAL IMPACTS AND RESIDUAL IMPACTS ON WATER RESOURCES

Water Resource (data source)	Overall Resource Vulnerability	Design Features of the Proposed Action	Initial Impact	Selective Mitigation Measure	Residual Impact	
					Resources Crossed	Resources Not Crossed
Specially Designated Waters						
Palustrine Forested Wetlands (NWI)	High	2, 26, 27, 28, 30, 33	High	2,4,7, 11	Moderate	Low
Class 1: Outstanding Waters (EPA)	High	1, 26, 27, 28, 30, 33	Moderate	1, 2, 3, 5, 7, 11, 13	Low	No Impact
Class 4: State Listed Impaired Waters (EPA)	High	1, 26, 27, 28, 30, 33	Moderate	1, 2, 3, 5, 7, 11, 13	Low	No Impact
Wetlands and Riparian Areas						
Palustrine Scrub-Shrub Wetlands (NWI)	Moderate	1, 2, 26, 28, 30, 33	Moderate	2, 4, 5, 7, 11	Moderate	Low
Palustrine Emergent Wetlands (NWI)	Moderate	1, 2, 18, 26, 28	Moderate	2, 5, 7, 13	Low	No Impact
Swamp Marsh, Estuary (NHD, NWI)	Moderate	1, 2, 26, 27, 28, 30, 33	Low	2,7	Low	No Impact
Riparian Areas (NWI, SWReGAP)	Moderate	1, 2, 26, 27, 28, 30, 33	Moderate	2, 4, 5, 7, 11, 13	Low	No Impact
Lentic/Lotic Waters						
Perennial Stream/River (NHD)	Moderate	1, 2, 27, 28, 30, 33	Moderate	1, 2, 3, 4, 5, 7, 11, 13	Moderate	Low
Intermittent Stream (NHD)	Moderate	1, 2, 18, 27, 28, 30, 33	Moderate	1, 2, 3, 4, 5, 7, 11, 13	Low	No Impact
Ephemeral Stream/ Wash (NHD)	Moderate	1, 2, 18, 27, 28, 30, 33	Low	2, 5, 7, 13	Low	No Impact
Well/Spring (NHD)	Moderate	1, 2, 30, 32, 33	Moderate	2,7	Low	No Impact
Lake, Reservoir, Pond (NHD)	Moderate	1, 27, 30, 33	Low	2,7	Low	No Impact
Canal/Ditch (NHD)	Low	2, 27, 30, 33	Low	2, 5, 7	Low	No Impact

SOURCES: U.S. Fish and Wildlife Service 2012a; U.S. Geological Survey 2010a, c)
EPA = Environmental Protection Agency
NHD = National Hydrography Dataset
NWI = National Wetlands Inventory
SWReGAP = Southwest Regional Gap Analysis Project

3.2.4.5 Results

All alternative routes and route variations considered for the Project potentially would affect lentic and lotic systems, including perennial and intermittent streams, lakes, ponds, limnetic subsystems, canals, and ditches. Impaired waters, outstanding waters, wetlands, and riparian areas also could be affected. Impacts on perennial lentic and lotic waters could include sedimentation from ground disturbance, temporary and permanent fill associated with development of access routes, removal of riparian vegetation, bank alteration, or accidental contamination associated with spills of environmentally harmful material. Impacts on intermittent lentic and lotic waters would be similar to perennial water features, although intermittent features typically have less associated riparian vegetation and would be more prone to erosion and sedimentation.

The USFS evaluated whether implementation of the Project would be in conformance with standards, guidelines, and management objectives pertaining to water resources contained in applicable USFS LRMPs. The results of these analyses are presented in the Water Resource and Compliance Report, which is available for review and download from the Project website. The analysis found that the Project could be approved in compliance with standards, guidelines, and management objectives pertaining to water resources contained in applicable USFS LRMPs.

The following sections identify the water resources potentially affected by the proposed Project and summarize potential impacts resulting from the construction, operation, and maintenance of the Project. Impacts are organized by water resource category (i.e., specially designated waters, wetlands and riparian areas, and lentic and lotic waters). For each alternative route, the names of perennial waters and specially designated waters are included. In many cases, the number of impacts does not equal the number of named waters listed because many of the waters are affected more than once by a particular alternative route. Similarly, impacts reported in the following sections often affect the same water body (i.e., one particular stream could be affected multiple times). All impacts are reported in the text and are further broken out in Tables 3-47, 3-48, 3-49 which summarize impacts on resources by alternative routes and route variations considered for the Project.

3.2.4.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.4.5.2 Impacts Common to All Action Alternatives

There are not any quantifiable impacts that would be common to all action alternative routes. However, moderate residual impacts would be associated with the construction of temporary and permanent Project facilities and would result from all alternative routes considered in proximity to perennial streams. While Project facilities would be sited as far away from the physical banks of any major waterway, construction and maintenance of the Project would result in some degree of ground disturbance. Removal of vegetation from the uplands and possibly from the riparian areas on the periphery of perennial streams, as well as soil compaction and decompaction from construction, operation, and maintenance, would result in greater potential for erosion and sedimentation into perennial streams or their tributaries. It is expected that through proper implementation of design features, Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13, and additional site-specific design features detailed in the Project POD, potential impacts would be mostly or entirely mitigated.

3.2.4.5.3 345-kilovolt Ancillary Transmission Components

The 345kV segments would be constructed in uplands currently being utilized for agriculture and livestock grazing. Construction of these three segments would not affect specially designated waters, impaired waters, wetlands or riparian areas, lentic waters, wells, or springs. The segments would affect nine unnamed intermittent lotic waters which are tributaries of Currant Creek and the Burraston Ponds (MV-6).

3.2.4.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B and associated route variations in Wyoming would affect 1 specially designated water, a crossing of the North Platte River, 1 outstanding water; 27 wetlands and riparian areas; 253 lotic waters, including 6 impacts on perennial streams (North Platte and Medicine Bow rivers) and 247 intermittent or ephemeral streams, 2 springs/wells; and 14 lentic water ponds (MV-6).

Named intermittent lotic waters of particular concern to the Rawlins Field Office along the Alternative WYCO-B include Barrel Springs Draw, Big Ditch, Coal Gulch, Hanna Draw, Hartt Cabin Draw, Saint Mary's Creek, Sand Creek, South Barrel Springs Draw, and Windmill Draw. These intermittent streams are subject to avoidance criteria described in the BLM Rawlins Field Office RMP (refer to Appendix E).

Environmental Consequences (Wyoming)

Alternative WYCO-B and Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Following proper implementation of selective mitigation measures (Table 3-46), a 0.4 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-B and route variations in Wyoming would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links W15 (Medicine Bow River) and W30 (North Platte River).

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-B and route variations in Wyoming would result in 48.0 miles of low residual impacts on specially designated waters, wetlands, and intermittent streams (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Colorado)

Alternative WYCO-B in Colorado would affect 34 state-listed 303(d) impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) as well as the Yampa River (COLCLY02_8100) suite of waters listed under those designations; 5 wetlands and riparian areas; 129 lotic waters, including one crossing each of the Little Snake and Yampa rivers and 127 intermittent or ephemeral streams; and 2 lentic waters (MV-6).

Route Variation WYCO-B-1 in Colorado varies at Link C72 from Alternative WYCO-B in Colorado. This route variation was developed to avoid the Sevenmile Ridge area. The route variation would affect two additional intermittent streams than Alternative WYCO-B in Colorado.

Route Variation WYCO-B-2 in Colorado varies at Link C173 from Alternative WYCO-B in Colorado and is located along U.S. Highway 40. The route variation includes Link C93 and would affect 8 additional intermittent streams and one additional lentic water than Alternative WYCO-B in Colorado.

Route Variation WYCO-B-3 in Colorado varies at Link C173 from Alternative WYCO-B in Colorado and is colocated with an existing transmission line for approximately 4 miles. The route variation includes Link 172 and would affect one less lentic water than Alternative WYCO-B in Colorado.

Environmental Consequences (Colorado)

Following proper implementation of selective mitigation measures (Table 3-46), a 0.4 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-B and route variations in Colorado would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the Project in proximity to perennial streams at Links C71 and C91.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-B and route variations in Colorado would result in 18.6 miles of low residual impacts resulting from crossing impaired waters, wetlands, and lotic waters (Table 3-47 and MV-6).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C and associated route variations in Wyoming could affect the North Platte River, 1 outstanding water; 23 wetlands and riparian areas; 302 lotic waters, including 6 impacts on perennial streams (North Platte and Medicine Bow rivers), 296 intermittent or ephemeral streams, 3 spring/wells, and 9 lentic waters (Table 3-47 and MV-6).

Named intermittent lotic waters of particular concern to the BLM Rawlins Field Office along Alternative WYCO-C include Big Ditch, Hanna Draw, Saint Mary's Creek, Sand Creek, Reader Cabin Draw, Willow Creek, and Windmill Draw. These intermittent streams are subject to avoidance criteria described in the BLM Rawlins Field Office RMP (Appendix E).

Environmental Consequences (Wyoming)

Following proper implementation of selective mitigation (Table 3-46), a 0.6 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-C and route variations in Wyoming would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links W30 and W15.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-C and route variations in Wyoming would result in 50.9 miles of low residual impacts on water quality from crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Colorado)

Alternative WYCO-C and associated route variations in Colorado would affect the same water resources as Alternative WYCO-B in Colorado (Table 3-47 and MV-6).

Environmental Consequences (Colorado)

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Alternative WYCO-C and associated route variations share a common alignment with Alternative WYCO-B through Colorado. Potential impacts resulting from development of Alternative WYCO-C in Colorado would be the same as those described for Alternative WYCO-B in Colorado.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming would affect 3 specially designated waters, including one crossing of the North Platte River, 1 outstanding water, and 2 state-listed 303(d) impaired waters from the Muddy Creek-1 (WYLS140500040104_01) and Muddy Creek-2 (WYLS1400500040308_01) suite of waters listed under those designations (Table 3-38); 27 wetlands and riparian areas; 242 lotic waters, including 11 perennial streams (Muddy Creek, Medicine Bow River, and North Platte River), 231 intermittent or ephemeral streams, 2 spring/wells, and 20 lentic waters (Table 3-47 and MV-6).

> Named intermittent lotic waters of particular concern to the BLM Rawlins Field Office along Alternative WYCO-D and Route Variation WYCO-D-1 include Antelope Creek, Big Ditch, Coal Gulch, Cottonwood Creek, Jim Creek, Pine Draw, Robber's Gulch, Soup Hole Wash, Saint Mary's Creek, South Pine Draw, and Standpipe Draw. These intermittent streams are subject to avoidance criteria described in the BLM Rawlins Field Office RMP (Appendix E).

Environmental Consequences (Wyoming)

Alternative WYCO-D

Following proper implementation of selective mitigation measures (Table 3-46) a 1.3 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of ground disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links W30, W15, W110, W111, and W121.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming would result in 46.8 miles of low residual impacts resulting from crossing specially designed waters, wetlands, lotic waters, and lentic waters (Table 3-47 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Colorado)

Alternative WYCO-D in Colorado would affect 34 state-listed 303(d) impaired waters from the West Evacuation Creek (COLCWH22_8501) and Douglas Creek (COLCWH22_8501) as well as the Yampa (COLCLY02_8100) suite of waters listed under those designations (Table 3-38); 10 wetlands and riparian areas; 237 lotic waters, including 10 perennial streams (Elkhead, Little Cottonwood, South Fork Fortification, Fortification, and Little Bear creeks; the Yampa and Little Snake rivers), 227 intermittent or ephemeral streams, 3 spring/wells; and 19 lentic waters, including one crossing of Culverwell Reservoir (Link C106) (Table 3-47 and MV-6).

Route Variation WYCO-D-1 diverges from Alternative WYCO-D in Colorado and replaces Link C173 with Link C172 to colocate the route variation with an existing transmission line for approximately 4 miles. Given the proximity of the two links and the drainage pattern in the vicinity, Links C173 and C172 could affect the same water resources.

Environmental Consequences (Colorado)

Alternative WYCO-D

Following proper implementation of selective mitigation measures (Table 3-46), 1.4 miles of moderate residual impacts on water resources associated with implementation of Alternative WYCO-D in Colorado would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links C100, C13, C105, C106, and C27.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-D in Colorado would result in 34.2 miles of low residual impacts as a result of crossing wetlands, lotic waters, and lentic waters (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative WYCO-D Route Variation (WYCO-D-1)

Route Variation WYCO-D-1 would result in similar impacts on water resources. Substituting Link C173 with Link C172 would result in some variation between impacts on the same water resources. Following proper implementation of selective mitigation measures, 1.4 miles of moderate residual impacts on water resources associated with implementation of Route Variation WYCO-D-1 in Colorado would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links C100, C13, C105, C106, and C27.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Route Variation WYCO-D-1 in Colorado would result in 34.7 miles of low residual impacts as a result of crossing wetlands, lotic waters, and lentic waters (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F and associated route variations in Wyoming would affect 1 specially designated water, a crossing of the North Platte River, 1 outstanding water; 28 wetlands and riparian areas; 292 lotic waters, including 6 perennial streams (Medicine Bow and North Platte rivers), 286 intermittent or ephemeral streams, 2 spring/wells; and 13 lentic waters (MV-6).

Named intermittent lotic waters of particular concern to the BLM Rawlins Field Office along Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 include Antelope Creek, Big Ditch, Coal Gulch, Cottonwood Creek, Jim Creek, Pine Draw, Robber's Gulch, Soup Hole Wash, Saint

Mary's Creek, South Pine Draw, and Standpipe Draw. These intermittent streams would be subject to avoidance criteria described in the BLM Rawlins Field Office RMP (refer to Appendix E).

Environmental Consequences

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Following proper implementation of selective mitigation measures (Table 3-46), a 0.6 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links W15 and W30.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming would result in 51.3 miles of low residual impacts as a result of crossings specially designated waters, wetlands and riparian areas, and lotic waters (Table 3-47 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Colorado)

Alternative WYCO-F in Colorado would affect 34 state-listed 303(d) impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) as well as the Yampa River (COLCLY02_8100) suite of waters listed under those designations (Table 3-38); 5 wetlands and riparian areas; 129 lotic waters, including 2 perennial streams (Little Snake and Yampa rivers), and 127 intermittent or ephemeral streams; and 2 lentic waters. Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 differ only slightly from Alternative WYCO-F in Colorado (Table 3-47 and MV-6).

Route Variation WYCO-F-1 in Colorado would affect 34 state-listed 303(d) impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) as well as the Yampa River (COLCLY02_8100) suite of waters listed under those designations (Table 3-38); 5 wetlands and riparian areas, 131 lotic waters including 2 perennial streams (Little Snake and Yampa rivers) and 129 intermittent or ephemeral streams; and 2 lentic waters.

Route Variation WYCO-F-2 in Colorado would 34 state-listed 303(d) impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) as well as the Yampa River (COLCLY02_8100) suite of waters listed under those designations (Table 3-38); 5 wetlands and riparian areas, 137 lotic waters including 2 perennial streams (Little Snake and Yampa rivers) and 135 intermittent or ephemeral streams; and 3 lentic waters.

Route Variation WYCO-F-3 in Colorado would affect 34 state-listed 303(d) impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) as well as the Yampa River (COLCLY02_8100) suite of waters listed under those designations (Table 3-38); 5 wetlands and riparian areas, 129 lotic waters including 2 perennial streams (Little Snake and Yampa rivers) and 127 intermittent or ephemeral streams; and 1 lentic water.

Environmental Consequences

Alternative WYCO-F

Following proper implementation of selective mitigation measures (Table 3-46), a 0.4 mile moderate residual impact on water resources associated with implementation of Alternative WYCO-F in Colorado would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of ground disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links C61 and C91.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative WYCO-F in Colorado would result in 18.6 miles of low residual impacts as a result of crossings wetlands, lotic waters, and lentic waters (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Following proper implementation of selective mitigation measures (Table 3-46), a 0.4 mile moderate residual impact on water resources associated with implementation of Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado would be anticipated.

Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of ground disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links C61 and C91.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado would result in 18.4, 19.9, and 19.1 miles, respectively, of low residual impacts as a result of crossings wetlands, lotic waters, and lentic waters (Table 3-47).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

TABLE 3-47
WATER RESOURCES IMPACT SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Water Resource Category (number)															Total Number of Water Resources		Total Miles of Initial Impacts				Total Miles of Residual Impacts		
		Specially Designated Waters						Wetlands and Riparian Areas		Lotic Waters					Lentic Waters										
		Impaired Waters		Outstanding Waters		Forested Wetlands				Perennial Streams		Intermittent Streams		Spring/ Well											
		Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	None	Low	Moderate	High	None	Low	Moderate
Alternative WYCO-B and Route Variations																									
WYCO-B (Applicant Preferred Alternative)	204.5	27	7	1	0	0	0	17	15	6	2	310	64	2	7	9	368	99	137.1	1.7	65.7	0.0	137.1	66.6	0.8
Wyoming	*138.1*	*0*	*0*	*1*	*0*	*0*	*0*	*16*	*11*	*4*	*2*	*203*	*44*	*2*	*7*	*7*	*231*	*66*	*89.7*	*1.7*	*46.7*	*0.0*	*89.7*	*48.0*	*0.4*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*	*0*	*107*	*20*	*0*	*0*	*2*	*137*	*33*	*47.4*	*0.0*	*19.0*	*0.0*	*47.4*	*18.6*	*0.4*
WYCO-B-1	204.9	27	7	1	0	0	0	16	16	6	2	313	63	2	7	9	370	99	137.8	1.7	65.4	0.0	137.8	66.4	0.7
Wyoming	*138.1*	*0*	*0*	*1*	*0*	*0*	*0*	*16*	*11*	*4*	*2*	*203*	*44*	*2*	*7*	*7*	*231*	*66*	*89.7*	*1.7*	*46.7*	*0.0*	*89.7*	*48.0*	*0.4*
Colorado	*66.8*	*27*	*7*	*0*	*0*	*0*	*0*	*0*	*5*	*2*	*0*	*110*	*19*	*0*	*0*	*2*	*139*	*33*	*48.1*	*0.0*	*18.7*	*0.0*	*48.1*	*18.4*	*0.3*
WYCO-B-2 (Agency Preferred Alternative)	204.5	27	7	1	0	0	0	17	15	6	2	313	69	2	7	10	371	105	135.8	1.8	66.9	0.0	135.8	67.9	0.8
Wyoming	*138.1*	*0*	*0*	*1*	*0*	*0*	*0*	*16*	*11*	*4*	*2*	*203*	*44*	*2*	*7*	*7*	*231*	*66*	*89.7*	*1.7*	*46.7*	*0.0*	*89.7*	*48.0*	*0.4*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*	*0*	*110*	*25*	*0*	*0*	*3*	*140*	*39*	*46.1*	*0.1*	*20.2*	*0.0*	*46.1*	*19.9*	*0.4*
WYCO-B-3	204.5	27	7	1	0	0	0	18	14	6	2	310	64	2	7	8	369	97	136.6	1.7	66.2	0.0	136.6	67.1	0.8
Wyoming	*138.1*	*0*	*0*	*1*	*0*	*0*	*0*	*16*	*11*	*4*	*2*	*203*	*44*	*2*	*7*	*7*	*231*	*66*	*89.7*	*1.7*	*46.7*	*0.0*	*89.7*	*48.0*	*0.4*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*2*	*3*	*2*	*0*	*107*	*20*	*0*	*0*	*1*	*138*	*31*	*46.9*	*0.0*	*19.5*	*0.0*	*46.9*	*19.1*	*0.4*
Alternative WYCO-C and Route Variations																									
WYCO-C	210.4	27	7	1	1	0	0	17	11	6	2	346	77	3	5	6	402	107	139.9	1.1	69.4	0.0	139.9	69.5	1.0
Wyoming	*144.0*	*0*	*0*	*1*	*1*	*0*	*0*	*16*	*7*	*4*	*2*	*239*	*57*	*3*	*5*	*4*	*265*	*74*	*92.5*	*1.1*	*50.4*	*0.0*	*92.5*	*50.9*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*		*107*	*20*	*0*		*2*	*137*	*33*	*47.4*	*0.0*	*19.0*	*0.0*	*47.4*	*18.6*	*0.4*
WYCO-C-1	210.8	27	7	1	1	0	0	16	12	6	2	349	76	3	5	6	404	107	140.6	1.1	69.1	0.0	140.6	69.3	0.9
Wyoming	*144.0*	*0*	*0*	*1*	*1*	*0*	*0*	*16*	*7*	*4*	*2*	*239*	*57*	*3*	*5*	*4*	*265*	*74*	*92.5*	*1.1*	*50.4*	*0.0*	*92.5*	*50.9*	*0.6*
Colorado	*66.8*	*27*	*7*	*0*	*0*	*0*	*0*	*0*	*5*	*2*	*0*	*110*	*19*	*0*		*2*	*139*	*33*	*48.1*	*0.0*	*18.7*	*0.0*	*48.1*	*18.4*	*0.3*
WYCO-C-2	210.4	27	7	1	1	0	0	17	11	6	2	349	82	3	5	7	405	113	138.6	1.2	70.6	0.0	138.6	70.8	1.0
Wyoming	*144.0*	*0*	*0*	*1*	*1*	*0*	*0*	*16*	*7*	*4*	*2*	*239*	*57*	*3*	*5*	*4*	*265*	*74*	*92.5*	*1.1*	*50.4*	*0.0*	*92.5*	*50.9*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*	*0*	*110*	*25*	*0*		*3*	*140*	*39*	*46.1*	*0.1*	*20.2*	*0.0*	*46.1*	*19.9*	*0.4*
WYCO-C-3	210.4	27	7	1	1	0	0	18	10	6	2	346	77	3	5	5	403	105	139.4	1.1	69.9	0.0	139.4	70.0	1.0
Wyoming	*144.0*	*0*	*0*	*1*	*1*	*0*	*0*	*16*	*7*	*4*	*2*	*239*	*57*	*3*	*5*	*4*	*265*	*74*	*92.5*	*1.1*	*50.4*	*0.0*	*92.5*	*50.9*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*2*	*3*	*2*	*0*	*107*	*20*	*0*		*1*	*138*	*31*	*46.9*	*0.0*	*19.5*	*0.0*	*46.9*	*19.1*	*0.4*
Alternative WYCO-D and Route Variations																									
WYCO-D	250.0	29	7	1	0	0	0	17	20	17	4	383	75	5	12	27	459	138	166.3	2.7	81.0	0.0	166.3	81	2.7
Wyoming	*135.0*	*2*	*0*	*1*	*0*	*0*	*0*	*13*	*14*	*8*	*3*	*201*	*30*	*2*	*6*	*14*	*231*	*63*	*86.9*	*0.7*	*47.4*	*0.0*	*86.9*	*46.8*	*1.3*
Colorado	*115.0*	*27*	*7*	*0*	*0*	*0*	*0*	*4*	*6*	*9*	*1*	*182*	*45*	*3*	*6*	*13*	*228*	*75*	*79.4*	*2.0*	*33.6*	*0.0*	*79.4*	*34.2*	*1.4*
WYCO-D-1	250.0	29	7	1	0	0	0	18	19	17	4	383	75	5	12	26	460	136	165.8	2.7	81.5	0.0	165.8	81.5	2.7
Wyoming	*135.0*	*2*	*0*	*1*	*0*	*0*	*0*	*13*	*14*	*8*	*3*	*201*	*30*	*2*	*6*	*14*	*231*	*63*	*86.9*	*0.7*	*47.4*	*0.0*	*86.9*	*46.8*	*1.3*
Colorado	*115.0*	*27*	*7*	*0*	*0*	*0*	*0*	*5*	*5*	*9*	*1*	*182*	*45*	*3*	*6*	*12*	*229*	*73*	*78.9*	*2.0*	*34.1*	*0.0*	*78.9*	*34.7*	*1.4*
Alternative WYCO-F and Route Variations																									
WYCO-F	218.9	27	7	1	0	0	0	16	17	6	2	347	66	2	5	10	402	104	148.0	1.4	69.5	0.0	148	69.9	1.0
Wyoming	*152.5*	*0*	*0*	*1*	*0*	*0*	*0*	*15*	*13*	*4*	*2*	*240*	*46*	*2*	*5*	*8*	*265*	*71*	*100.6*	*1.4*	*50.5*	*0.0*	*100.6*	*51.3*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*	*0*	*107*	*20*	*0*	*0*	*2*	*137*	*33*	*47.4*	*0.0*	*19.0*	*0.0*	*47.4*	*18.6*	*0.4*
WYCO-F-1	219.3	27	7	1	0	0	0	15	18	6	2	350	65	2	5	10	404	104	148.7	1.4	69.2	0.0	148.7	69.7	0.9
Wyoming	*152.5*	*0*	*0*	*1*	*0*	*0*	*0*	*15*	*13*	*4*	*2*	*240*	*46*	*2*	*5*	*8*	*265*	*71*	*100.6*	*1.4*	*50.5*	*0.0*	*100.6*	*51.3*	*0.6*
Colorado	*66.8*	*27*	*7*	*0*	*0*	*0*	*0*	*0*	*5*	*2*	*0*	*110*	*19*	*0*	*0*	*2*	*139*	*33*	*48.1*	*0.0*	*18.7*	*0.0*	*48.1*	*18.4*	*0.3*
WYCO-F-2	218.9	27	7	1	0	0	0	16	17	6	2	350	71	2	5	11	405	110	146.7	1.5	70.7	0.0	146.7	71.2	1.0
Wyoming	*152.5*	*0*	*0*	*1*	*0*	*0*	*0*	*15*	*13*	*4*	*2*	*240*	*46*	*2*	*5*	*8*	*265*	*71*	*100.6*	*1.4*	*50.5*	*0.0*	*100.6*	*51.3*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*1*	*4*	*2*	*0*	*110*	*25*	*0*	*0*	*3*	*140*	*39*	*46.1*	*0.1*	*20.2*	*0.0*	*46.1*	*19.9*	*0.4*
WYCO-F-3	218.9	27	7	1	0	0	0	17	16	6	2	347	66	2	5	9	403	102	147.5	1.4	70.0	0.0	147.5	70.4	1.0
Wyoming	*152.5*	*0*	*0*	*1*	*0*	*0*	*0*	*15*	*13*	*4*	*2*	*240*	*46*	*2*	*5*	*8*	*265*	*71*	*100.6*	*1.4*	*50.5*	*0.0*	*100.6*	*51.3*	*0.6*
Colorado	*66.4*	*27*	*7*	*0*	*0*	*0*	*0*	*2*	*3*	*2*	*0*	*107*	*20*	*0*	*0*	*1*	*138*	*31*	*46.9*	*0.0*	*19.5*	*0.0*	*46.9*	*19.1*	*0.4*

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado would affect 71 state-listed 303(d) impaired waters from the Evacuation Creek (UT14050007-003_00) and West Evacuation Creek and Douglas Creek (COLCWH22_8501) suite of waters listed under those designations (Table 3-38), 17 wetlands and riparian areas including one Palustrine Scrub-Shrub Wetland at Link C177; 205 lotic waters, including 4 perennial streams (White River, Douglas Creek, and Whiskey Creek) and 201 intermittent or ephemeral streams; and 14 lentic waters (Box Elder and Villard Flats Reservoirs) (MV-6).

Environmental Consequences (Colorado)

Following proper implementation of selective mitigation measures (Table 3-46), 2.3 miles moderate residual impacts on water resources associated with implementation of Alternative COUT BAX-B in Colorado would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links C177, C185, and C196.

Moderate residual impacts resulting from this alternative route also could be attributed to permanent modification of existing wetlands including potential impacts on Palustrine Scrub-Shrub Wetlands at Link C177. Wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives off oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT BAX-B in Colorado would result in 39.8 miles of low residual impacts as a result of crossings wetlands, lotic waters, and lentic waters (Table 3-48 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Utah)

Alternative COUT BAX-B in Utah would affect 127 specially designated waters, including 32 outstanding waters (Maple Gulch, Mariunus, Booths, Dry, Forbs, Rocky Ridge, and Salt Spring canyons; Cottonwood, Deer, Whetstone, Indian, and North Fork Coal creeks; one outstanding spring) and 95 state-listed 303(d) impaired waters from the Cottonwood Wash (UT14030001-001_00), Huntington Creek-1 (UT14060009-010_00), Price River – Woodside to Soldier Creek (UT14060007-014), and Westwater Creek (UT14030001-003_00) suite of waters listed under those designations (Table 3-38); 11 wetlands and riparian areas; 344 lotic waters, including 19 perennial streams (Thompson and Floy washes; Deer, Pleasant, Coal Fork, Indian, Hop, Salt, West, Currant, and Huntington creeks; Green and San Pitch rivers; and Water Hollow), 325 intermittent or ephemeral streams and 3 springs; as well as 11 lentic waters (Table 3-48 and MV-6).

Environmental Consequences (Utah)

Following proper implementation of selective mitigation measures (Table 3-46) 1.8 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT BAX-B in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of ground disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U426, U486, U487, U498, U630, U636, U639, U650, and U731.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT BAX-B in Utah would result in 50.3 miles of low residual impacts as a result of crossing specially designated waters and wetlands (Table 3-48).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT BAX-C

Affected Environment (Colorado)

Alternative COUT BAX-C in Colorado shares a common alignment with Alternative COUT BAX-B in Colorado and could affect the same water resources (Table 3-48 and MV-6).

Environmental Consequences (Colorado)

Alternative COUT BAX-C in Colorado shares a common alignment with Alternative COUT BAX-B in Colorado and would have the same potential to impact water resources described under that alternative route.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah would affect 134 specially designated waters, including 32 outstanding waters (Maple Gulch, Mariunus, Booths, Dry, Forbs, Rocky Ridge, and Salt Spring canyons; Cottonwood, Deer, Whetstone, Indian, and North Fork Coal creeks; one outstanding spring) and 102 303(d) state-listed impaired waters from the Cottonwood Wash (UT14030001-001_00), Huntington Creek-1 (UT14060009-010_00), Price River – Woodside to Soldier Creek (UT14060007-014), and Westwater Creek (UT14030001-003_00) suite of waters listed under those designations (Table 3-38); 12 wetlands and riparian areas including one Palustrine Scrub Shrub wetland at Link C177; 363 lotic waters, including 19 perennial (Thompson and Floy washes; Deer, Pleasant, Coal Fork, Indian, Hop, Salt, West, Currant, and Huntington creeks; Green and San Pitch rivers; and Water Hollow), and 344 intermittent or ephemeral streams, 2 springs; and 10 lentic waters (Table 3-48 and MV-6).

Environmental Consequences (Utah)

Following proper implementation of selective mitigation measures (Table 3-46), 1.8 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT BAX-C in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U486, U487, U629, U630, U631, U639, U650, and U731.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative

COUT BAX-C in Utah would result in 52.7 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-48 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT BAX-E

Affected Environment (Colorado)

Alternative COUT BAX-E in Colorado shares a common route with Alternative COUT BAX-B in Colorado and would affect the same water resources (Table 3-48 and MV-6).

Environmental Consequences (Colorado)

Alternative COUT BAX-E in Colorado shares a common route with Alternative COUT BAX-B in Colorado and would have the same potential to impact water resources described under that alternative route.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah would affect 180 specially designated waters, including 26 outstanding waters (Boarding House Gulch; Gooseberry, Upper Huntington, Cottonwood, Maple Fork, and White Pine Fork creeks; Swens, Burnout, North Fork Swens, Forbs, Rocky Ridge, and Salt Spring canyons) and 154 303(d) state-listed impaired waters from the Cottonwood Wash (UT14030001-001_00), Deer Creek (UT14060009-003), Gordon Creek and Tributaries (UT14060007-006), Huntington Creek-1 (UT14060009-010_00), Price River-5 (UT14060007-015), Price River – Woodside to Soldier Creek (UT14060007-014), and Westwater Creek (UT14030001-003_00) suite of waters listed under those designations (Table 3-38); 17 wetlands and riparian areas including 1 Palustrine Scrub-Shrub Wetland at Link U495; 351 lotic waters, including 35 perennial streams (San Pitch, Green and Price rivers; Currant, Hop, Upper Huntington, Cottonwood, White Pine Fork, Mud, Gooseberry, and Miller creeks; Mud Water, Bob Wright, and Trail canyons; Floy, Water Hollow, and Thompson washes), 316 intermittent or ephemeral streams, 1 spring and; 13 lentic waters (Table 3-48 and MV-6).

Environmental Consequences (Utah)

Following proper implementation of selective mitigation measures (Table 3-46), 2.7 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT BAX-E in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U486, U487, U489, U495, U537, U585, U600, U636, U639, and U650.

Moderate impacts resulting from this alternative route also could be attributed to direct or indirect modification of existing wetlands including the Palustrine Scrub-Shrub Wetlands at Link U495. Wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT BAX-E in Utah would result in 58.2 miles of low residual impacts as a result of crossings specially designated waters, wetlands, lotic waters and lentic waters (Table 3-48 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

TABLE 3-48
WATER RESOURCES IMPACT SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

		Water Resource Category (number)																							
		Specially Designated Waters								Lotic Waters															
		Impaired Waters		Outstanding Waters		Forested Wetlands		Wetlands and Riparian Areas		Perennial Streams		Intermittent Streams		Spring/ Well	Lentic Waters		Total Number of Water Resources		Total Miles of Initial Impacts				Total Miles of Residual Impacts		
Alternative Route	Total Miles	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	None	Low	Moderate	High	None	Low	Moderate
COUT BAX-B	279.2	133	33	24	8	0	0	15	13	19	4	411	115	3	2	23	604	199	184.7	0.7	93.8	0.0	184.7	90.4	4.1
Colorado	*86.7*	*51*	*20*	*0*	*0*	*0*	*0*	*8*	*9*	*4*	*0*	*143*	*58*	*0*	*2*	*12*	*208*	*99*	*44.6*	*0.3*	*41.8*	*0.0*	*44.6*	*39.6*	*2.5*
Utah	*192.5*	*82*	*13*	*24*	*8*	*0*	*0*	*7*	*4*	*15*	*4*	*268*	*57*	*3*	*0*	*11*	*396*	*100*	*140.1*	*0.4*	*52.0*	*0.0*	*140.1*	*50.8*	*1.6*
COUT BAX-C	289.7	138	35	24	8	0	0	16	13	19	4	422	123	2	2	22	621	207	192.8	0.8	96.1	0.0	192.8	92.8	4.1
Colorado	*86.7*	*51*	*20*	*0*	*0*	*0*	*0*	*8*	*9*	*4*	*0*	*143*	*58*	*0*	*2*	*12*	*208*	*99*	*44.6*	*0.3*	*41.8*	*0.0*	*44.6*	*39.6*	*2.5*
Utah	*203*	*87*	*15*	*24*	*8*	*0*	*0*	*8*	*4*	*15*	*4*	*279*	*65*	*2*	*0*	*10*	*413*	*108*	*148.2*	*0.5*	*54.3*	*0.0*	*148.2*	*53.2*	*1.6*
COUT BAX-E	291.5	172	53	22	4	0	0	17	17	29	10	400	117	1	3	24	643	226	188.6	2.1	100.8	0.0	188.6	97.9	5.0
Colorado	*86.7*	*51*	*20*	*0*	*0*	*0*	*0*	*8*	*9*	*4*	*0*	*143*	*58*	*0*	*2*	*12*	*208*	*99*	*44.6*	*0.3*	*41.8*	*0.0*	*44.6*	*39.6*	*2.5*
Utah	*204.8*	*121*	*33*	*22*	*4*	*0*	*0*	*9*	*8*	*25*	*10*	*257*	*59*	*1*	*1*	*12*	*435*	*127*	*14.4*	*1.8*	*59.0*	*0.0*	*144.0*	*58.3*	*2.5*

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A and Route Variation COUT-A-1 in Colorado would affect 15 303(d) state-listed impaired waters from the West Evacuation Creek and Douglas Creek (COLCWH22_8501) suite of waters listed under those designations (Table 3-38); 2 wetlands; 58 intermittent or ephemeral streams; and 1 lentic water (Box Elder Reservoir No. 2) (Table 3-49 and MV-6).

Environmental Consequences (Colorado)

Following proper implementation of selective mitigation measures (Table 3-46), temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-A and Route Variation COUT-A-1 in Colorado would result in 8.6 miles of low residual impacts as a result of crossing wetlands, lotic waters, and lentic waters (Table 3-49 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Utah)

Alternative COUT-A in Utah would affect 239 specially designated waters, including 57 outstanding waters (Duchesne and Strawberry rivers; French and Tank hollows; Center, Buffalo, Right Fork Timber, Cox, Blind, Forbs, Rocky Ridge, and Salt Spring canyons; Sheep and Tie Fork creeks), 181 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_01), Lake Fork-1 (UT14060003-008_00), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 42 wetlands and riparian areas; 318 lotic waters, including 43 perennial streams (Baser, Big Sand, and Red washes; Blind Canyon, Water Hollow; Currant, Dry Gulch, Hop, Lake Fork, Left Fork Spencer, Montes, Red, Salt, Sheep, Soldier, Thistle, Tie Fork, and West creeks; Duchesne, Green, Lake Fork, Strawberry, and Uinta rivers) and 275 intermittent or ephemeral streams, 2 springs; and 34 lentic waters (Table 3-49 and MV-6).

Route Variation COUT-A-1 in Utah would affect 238 specially designated waters, including 56 outstanding waters (Duchesne and Strawberry rivers; French and Tank hollows; Center, Right Fork Timber, Cox, Blind, Forbs, Rocky Ridge, and Salt Spring canyons; Sheep and Tie Fork creeks) and 181 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Lake Fork-1 (UT14060003-008_00), Soldier Creek-1 (UT16020202-022_00), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 42 wetlands and riparian areas; 319 lotic waters, including 44 perennial streams (Strawberry, Duchesne, and Lake Fork rivers; Blind Canyon, Red Wash, and Monty's, Dry Gulch, Red, Currant, Tie Fork, Sheep, Soldier, Lake Fork, Thistle, Left Fork Spencer, and Hop creeks) and 275 intermittent or ephemeral streams, 2 springs; and 32 lentic waters.

Environmental Consequences (Utah)

Alternative COUT-A

Following proper implementation of selective mitigation measures (Table 3-46) 4.2 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT-A in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation

from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U241, U410, U420, U424, U433, U460, U621, U625, U639, and U650.

Moderate impacts resulting from this alternative route also could be attributed to direct or indirect modification of existing wetlands including a Palustrine Forested Wetland associated with the Green River at Link U390. Wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-A in Utah would result in 62.3 miles of low residual impacts as a result of crossings specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT-A Route Variation (COUT-A-1)

Route Variation COUT-A-1 in Utah differs only slightly from Alternative COUT-A in Utah as a result of replacing Link U429 with Link U428 and moving the route up to the Chipman Ridge area. This adjustment would result in one less impact on specially designated waters, one additional impact on a perennial stream (Duchesne River), and two fewer impacts on lentic waters.

Following proper implementation of selective mitigation (Table 3-46), 4.2 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-A-1 in Utah would be anticipated.

Additionally, 63.0 miles of low residual impacts (Table 3-49) would be expected to result from the construction, operation, and maintenance of Route Variation COUT-A-1 in Utah.

Moderate and low residual impacts would be attributed to the same actions as described under Alternative COUT-A in Utah.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

Alternative COUT-B in Colorado follows a common route with Alternative COUT-A in Colorado. The water resources affected by that alternative would be the same for Alternative COUT-B in Colorado (Table 3-49 and MV-6).

Alternative COUT-B route variations in Colorado follow a common route and could affect the same water resources.

Environmental Consequences (Colorado)

Alternative COUT-B

Alternative COUT-B in Colorado follows a common route with Alternative COUT-A in Colorado. Both alternative routes would be expected to result in the same residual impacts on water resources in Colorado.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

The Alternative COUT-B route variations all share a common route through Colorado, and would be expected to affect the same water resources as described under Alternative COUT-A in Colorado. Additionally, these route variations would be expected to result in the same residual impacts on water resources as those described under Alternative COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-B in Utah would affect 312 specially designated waters, including 82 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks), 229 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060006-001_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT1406003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 40 wetlands and riparian areas; 389 lotic waters, including 68 perennial streams (Montes, Dry Gulch, Hop, Kyune, Sowers, Argyle, Horse, Willow, Beaver, Indian, Soldier, Sheep, Tie Fork, Thistle, Left Fork Spencer, and Currant creeks; Price, Lake Fork, Duchesne, and Uinta rivers; Jack and Blind canyons; Baser, Big Sand, Cottonwood, and Red washes; and Lateral No. 5), 321 intermittent or ephemeral streams, 4 springs, 1 well; and 24 lentic waters (Table 3-49 and MV-6).

Alternative COUT-B route variations would differ slightly from Alternative COUT-B in Utah. Each route variation would include alternate links utilized by all route variations in different combinations to replace Links U434, U524, and U527.

Route Variation COUT-B-1 in Utah would utilize Links U511, U513, U515, and U560 and would affect 284 specially designated waters including 88 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks), 195 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 40 wetlands and riparian areas; 354 lotic waters, including 58 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Lake Fork, Left Fork Spencer, Montes, Salt, Sheep, Soldier, Sowers, Tabbyune, Thistle, Tie Fork, and West creeks; Baser, Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow), 296 intermittent or ephemeral streams, 3 springs; and 28 lentic waters.

Route Variation COUT-B-2 in Utah would utilize Links U511, U514, U515, U520, U540, and U560 and would affect 299 specially designated waters including 88 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks), 210 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters

listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 41 wetlands and riparian areas; 370 lotic waters including 67 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Slat, Sheep, Soldier, Sowers, Tabbyune, thistle, West Fork Willow, and Willow creeks; Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow); 303 intermittent or ephemeral streams, 3 springs; and 30 lentic waters.

Route Variation COUT-B-3 in Utah would utilize Links U512, U514, U516, and U560 and would affect 282 specially designated waters including 81 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks); 200 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 38 wetland and riparian areas; 358 lotic waters including 66 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Slat, Sheep, Soldier, Sowers, Tabbyune, Thistle, West Fork Willow, and Willow creeks; Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow); 292 intermittent or ephemeral streams, 3 springs; and 26 lentic waters.

Route Variation COUT-B-4 in Utah would utilize Links U512, U514, U515, U540, and U560 and would affect 292 specially designated waters including 88 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks); 203 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 40 wetland and riparian areas; 362 lotic waters including 64 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Salt, Sheep, Soldier, Sowers, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Duchesne, Green, Lake Fork, Uinta, and White rivers; Big Sand and Red washes; Blind Canyon, Lateral No. 5, and Water Hollow) and 298 intermittent or ephemeral streams, 3 springs; and 29 lentic waters.

Route Variation COUT-B-5 in Utah would utilize Links U511, U514, U516, U520, and U560 and would affect 298 specially designated waters including 81 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Quitchampau, Rocky Ridge, Salt Spring, Trapper and Wire Fence canyons; Broad, Clem, Jolie, Mine, North Lost, South Lost, Trail, and Water hollows; Indian, Left Fork Spencer, Sheep, Sowers, Tabbyune, and Tie Fork creeks); 207 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations (Table 3-38), and 1 Palustrine Forested Wetland associated with the Green River at Link U390; 39 wetland and riparian areas; 366 lotic waters including 69 perennial streams (Argyle, Currant, Dry Gulch, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Montes, Right Fork Kyune, Salt, Sheep, Soldier, Sowers, Tabbyune, Thistle, West, West Fork Willow, and Willow creeks; Duchesne, Green, Lake Fork, Uinta, and White rivers; Big Sand and Red washes; Blind Canyon, and Water Hollow); 297 intermittent or ephemeral streams, 3 springs; and 27 lotic waters.

Environmental Consequences (Utah)

Alternative COUT-B

Following proper implementation of selective mitigation measures (Table 3-46), 8.5 miles moderate residual impact on water resources associated with implementation of Alternative COUT-B in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U241, U390, U410, U430, U431, U432, U460, U524, U530, U536, U539, U621, U625, U639, U650, and 1 Palustrine Forested Wetland associated with the Green River at Link U390.

Moderate impacts resulting from this alternative route also could be attributed permanent modification of existing wetlands. Wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-B in Utah would result in 62.8 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters and lentic waters (Table 3-49 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Alternative COUT-B route variations in Utah generally impact the same categories of water resources (Specially Designated Waters, Wetlands and Riparian Areas, Lotic and Lentic Waters) as Alternative COUT-B in Utah and residual impacts would be attributed to the same type of impacts as described under that alternative (i.e., permanent and temporary increases in sedimentation to perennial streams and temporary modification of lentic and/or lotic waters as well as wetland and/or riparian vegetation). The difference in the extent of residual impacts (miles of water resource affected) would be attributed to the replacement of Alternative COUT-B links with a new sequence of links.

Following proper implementation of selective mitigation measures (Table 3-46), 8.4 miles of moderate residual impact on water resources associated with implementation of Route Variation COUT-B-1 in Utah would be anticipated. Additionally, 58.7 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-B-1 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 9.0 miles of moderate residual impact on water resources associated with implementation of Route Variation COUT-B-2 in Utah would be anticipated. Additionally, 61.8 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters and lentic (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-B-2 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 8.6 miles of moderate residual impact on water resources associated with implementation of Route Variation COUT-B-3 in Utah would be anticipated. Additionally, 60.3 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-B-3 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 8.8 miles of moderate residual impact on water resources associated with implementation of Route Variation COUT-B-4 in Utah would be anticipated. Additionally, 59.8 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-B-4 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 8.8 miles of moderate residual impact on water resources associated with implementation of Route Variation COUT-B-5 in Utah would be anticipated. Additionally, 62.3 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-B-5 in Utah.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C in Colorado would affect 13 303(d) state-listed impaired waters from the West Excavation Creek and Douglas Creek (COLCWH22_8501) suite of waters listed under those designations, 2 wetlands, 59 intermittent or ephemeral streams, and 2 lentic waters (Table 3-49 and MV-6).

The Alternative COUT-C route variations all share a common route through Colorado and would affect nearly the same water resources as described under Alternative COUT-A in Colorado.

Environmental Consequences (Colorado)

Alternative COUT-C

Following proper implementation of selective mitigation measures (Table 3-46), temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-C in Colorado, would result in 8.0 miles of low and 0.2 miles of moderate residual impacts resulting from crossing impaired waters, wetlands, lotic waters, and lentic waters.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

The Alternative COUT-C route variations all share a common route through Colorado, and would be expected to result in nearly the same residual impacts on water resources as those described under Alternative COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-C in Utah would affect 111 specially designated waters, including 40 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Left Fork Spencer, Tie Fork, and Sheep creeks; Water Hollow, and the Price River) and 71 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 19 wetland and riparian areas including 2 impacts on Palustrine Scrub-Shrub Wetlands; 339 lotic waters, including 43 perennial streams (Argyle, Beaver, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Minnie Maud, Salt, Sheep, Soldier, Summit, Thistle, Tie Fork, West, and Willow creeks; Blind and Jack canyons; Price and

White rivers; and Water Hollow), 296 intermittent or ephemeral streams, 3 springs; and 12 lentic waters (Table 3-49 and MV-6).

Alternative COUT-C route variations differ slightly from Alternative COUT-C in Utah. Each route variation would include alternate links which would be utilized by all route variations in different combinations to replace Links U406, U408, U524, and U527.

Route Variation COUT-C-1 in Utah would utilize Links U409, U511, U513, U515, and U560 and would affect 85 specially designated waters including 46 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Left Fork Spencer, Tie Fork, and Sheep creeks; Water Hollow, and the Price River) and 39 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 18 wetland and riparian areas; 304 lotic waters including 31 perennial streams (Argyle, Bear, Currant, Hop, Indian, Lake Fork, Left Fork Spencer, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow), 273 intermittent or ephemeral streams, 1 spring; and 14 lentic waters.

Route Variation COUT-C-2 in Utah would utilize Links U409, U514, U515, U520, U540, and U560 and would affect 100 specially designated waters including 46 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Left Fork Spencer, Sheep, Tabbyune, and Tie Fork creeks; and Water Hollow), and 54 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 19 wetland and riparian areas; 320 lotic waters including 40 perennial streams (Argyle, Bear, Currant, Hop, Indian, Lake Fork, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow); 280 intermittent or ephemeral streams, 1 spring; and 16 lentic waters.

Route Variation COUT-C-3 in Utah would utilize Links U409, U514, U516, U520, and U560 and would affect 90 specially designated waters including 39 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Left Fork Spencer, Sheep, and Tie Fork creeks; and Water Hollow); 51 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 17 wetland and riparian areas; 316 lotic waters including 42 perennial streams (Argyle, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Right Fork Kyune, Salt Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow), 274 intermittent or ephemeral streams 1 spring; and 13 lentic waters.

Route Variation COUT-C-4 in Utah would utilize Links U411, U512, U514, U515, and U560 and would affect 97 specially designated waters including 46 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Left Fork Spencer, Sheep, Tabbyune, and Tie Fork creeks; and Water Hollow), and 51 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 18 wetland and riparian areas; 324 lotic waters including 40 perennial streams (Argyle, Bear, Currant, Hop, Indian, Lake Fork, Left Fork Spencer, Minnie Maud, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork West, West Fork Willow and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow), 284 intermittent or ephemeral streams, 1 spring; and 15 lentic waters.

Route Variation COUT-C-5 in Utah would utilize Links U411, U512, U514, U516, and U560 and would affect 87 specially designated waters including 39 outstanding waters (Blind, Cox, Forbs, Garner, Heslington, Hicks, Rocky Ridge, and Salt Spring canyons; Indian, Sheep, and Tie Fork creeks; and Water Hollow), and 48 303(d) state-listed impaired waters from the Price River – Woodside to Soldier Creek (UT14060007-014), Soldier Creek-1 (UT16020202-012), Thistle Creek-1 (UT16020202-022_00), and Willow Creek (UT14060006-001_00) suite of waters listed under those designations (Table 3-38); 16 wetland and riparian areas; 320 lotic waters including 42 perennial streams (Argyle, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Minnie Maud, Right Fork Kyune, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Green and White rivers; Blind Canyon and Water Hollow), 278 intermittent or ephemeral streams, 1 spring; and 12 lentic waters.

Environmental Consequences (Utah)

Alternative COUT-C

Following proper implementation of selective mitigation measures (Table 3-46), 3.0 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT-C in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U300, U400, U404, U406, U460, U524, U530, U539, U621, U625, U639, and U650, as well as impacts on Palustrine Scrub-Shrub Wetlands at Links U300 and U400 (Table 3-49 and MV-6).

Moderate impacts resulting from this alternative route also could be attributed to direct or indirect modification of existing wetlands. Wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-C in Utah would result in 49.2 miles of low residual impacts resulting from crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49).

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5).

Alternative COUT-C route variations in Utah generally would impact the same categories of water resources (Specially Designated Waters, Wetlands and Riparian Areas, Lotic and Lentic Waters) as Alternative COUT-C in Utah and residual impacts would be attributed to the same type of impacts as described under that alternative (i.e., permanent and temporary increases in sedimentation to perennial streams and temporary modification of lentic and/or lotic waters as well as wetland and/or riparian vegetation). The difference in the extent of residual impacts (miles of water resource affected) would be attributed to the replacement of Alternative COUT-C links with a new sequence of links.

Following proper implementation of selective mitigation measures (Table 3-46), 3.0 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-C-1 in Utah would be anticipated. Additionally, 45.7 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-C-1 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 3.6 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-C-2 in Utah would be anticipated. Additionally, 48.8 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-C-2 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 3.4 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-C-3 in Utah would be anticipated. Additionally, 49.3 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters and lentic (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-C-3 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 3.6 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-C-4 in Utah would be anticipated. Additionally, 47.9 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-C-4 in Utah.

Following proper implementation of selective mitigation measures (Table 3-46), 3.4 miles of moderate residual impacts on water resources associated with implementation of Route Variation COUT-C-5 in Utah would be anticipated. Additionally, 48.4 miles of low residual impacts as a result of crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49) would be expected to result from construction, operation, and maintenance of Route Variation COUT-C-5 in Utah.

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment (Colorado)

Alternative COUT-H in Colorado follows a common alignment with Alternative COUT-C in Colorado and would affect the same water resources (Table 3-49 and MV-6).

Environmental Consequences (Colorado)

Alternative COUT-H in Colorado follows a common alignment with Alternative COUT-C in Colorado and would have the same residual impacts on waters resources.

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Utah)

Alternative COUT-H in Utah would affect 108 specially designated waters including 81 impaired waters from the Dry Gulch Creek, Duchesne River-3, Lake Fork-1, Price River-Woodside to Soldier Creek, Thistle Creek-1, and Uinta River-2, and 27 outstanding waters (Boarding House, Burnout, Swens, North Fork Swens, Forbs, Rocky Ridge, and Salt Spring canyons; Upper Huntington, Cottonwood, Maple Fork, White Pine Fork, and Gooseberry creeks); 17 wetlands and riparian areas including 3 impacts on Palustrine Scrub-Shrub Wetlands; 315 lotic waters, including 44 perennial streams (Argyle, Cottonwood, Currant, Gooseberry, Hop, Minnie Maud, Mud, North Fork Gordon, Salt, Summit, Upper Huntington, West, White Pine Fork, and Willow creeks; Boarding House, Deep, Mathis, and Trail canyons; Green, Price, and San Pitch rivers), 271 intermittent or ephemeral streams, and 14 lentic waters (Table 3-49 and MV-6).

Environmental Consequences (Utah)

Following proper implementation of selective mitigation measures (Table 3-46), 2.4 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT-H in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation and maintenance of the Project in proximity to perennial streams at Links U300, U400, U404, U406, U435, U545, U548, U600, U636, U639, and U650, as well as outstanding waters.

Moderate impacts resulting from this alternative route also could be attributed to direct or indirect modification of Palustrine Scrub-Shrub Wetlands at Links U300 and U400. Palustrine Scrub-Shrub wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-H in Utah would result in 51.4 miles of low residual impacts resulting from crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Alternative COUT-I

Affected Environment (Colorado)

Alternative COUT-I in Colorado follows a common alignment with Alternative COUT-C in Colorado and would affect the same water resources.

Environmental Consequences (Colorado)

Alternative COUT-H in Colorado follows a common alignment with Alternative COUT-C in Colorado and would have the same residual impacts on waters resources.

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

Affected Environment (Utah)

Alternative COUT-I in Utah would affect 162 specially designated waters including 33 outstanding waters (Maple Gulch, Mariunus, Booths, Dry, North Fork Coal, Forbs, Rocky Ridge, and Salt Spring canyons; Cottonwood, Deer, Whetstone, and Indian creeks); 129 303(d) state-listed impaired waters from the Dry Gulch Creek (UT14060003-009_00), Duchesne River-3 (UT14060003-006_00), Lake Fork-1 (UT14060003-008_00), Price River – Woodside to Soldier Creek (UT14060007-014), Thistle Creek-1 (UT16020202-022_00), and Uinta River-2 (UT14060003-004_00) suite of waters listed under those designations; 19 wetland and riparian areas; 433 lotic waters, including 39 perennial streams (Argyle, Cedar, Coal, Coal Fork, Currant, Deer, Hop, Huntington, Indian, Miller, Minnie Maud, Pleasant, Salt, Soldier, Summit, West, and Willow creeks; Green, Price, San Pitch, and White rivers; Marsing Wash, and Water Hollow), 394 intermittent or ephemeral streams, 2 springs; and 15 lentic waters (Table 3-49 and MV-6).

Environmental Consequences (Utah)

Following proper implementation of selective mitigation measures (Table 3-46), 3.8 miles of moderate residual impacts on water resources associated with implementation of Alternative COUT-I in Utah would be anticipated. Moderate residual impacts would result from permanent increases in sedimentation from the indirect effects of surface disturbance and subsequent erosion and sedimentation associated with operation, and maintenance of the Project in proximity to perennial streams at Links U300, U400, U404, U406, U492, U494, U498, U523, U587, U629, U630, U631, U639, and U650.

Moderate impacts resulting from this alternative route also could be attributed to direct or indirect modification of Palustrine Scrub-Shrub Wetlands at Links U300 and U400. Palustrine Scrub-Shrub wetlands in this area provide functions and services that maintain water quality through filtering sediment, attenuating run-off flows from gaining momentum and eroding topsoil; through abiotic and biotic assimilation of nutrients and particles, which produces organic soil components and gives of oxygen, as well as providing a vector for groundwater recharge.

Temporary increases in erosion and sedimentation as well as temporary removal or modification of wetland and riparian vegetation associated with construction, operation, and maintenance of Alternative COUT-I in Utah would result in 63.9 miles of low residual impacts resulting from crossing specially designated waters, wetlands, lotic waters, and lentic waters (Table 3-49 and MV-6).

Table 3-45 outlines the criteria for assessing and assigning these moderate and low residual impacts.

TABLE 3-49
WATER RESOURCES IMPACT SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Water Resource Category (number)															Total Number of Waters Resources		Total Miles of Initial Impacts				Total Miles of Residual Impacts		
		Specially Designated Waters						Wetlands and Riparian Areas		Lotic Waters					Lentic Waters										
		Impaired Waters		Outstanding Waters		Forested Wetlands				Perennial Streams		Intermittent Streams		Spring/ Well											
		Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	None	Low	Moderate	High	None	Low	Moderate
Alternative COUT-A and Route Variation																									
COUT-A	206.0	152	44	48	9	1	0	28	16	31	12	258	75	2	7	28	525	186	131.0	0.6	74.2	0.2	131.0	70.8	4.2
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*182.0*	*141*	*40*	*48*	*9*	*1*	*0*	*28*	*14*	*31*	*12*	*217*	*58*	*2*	*7*	*27*	*473*	*162*	*115.6*	*0.6*	*65.6*	*0.2*	*115.6*	*62.4*	*4.0*
COUT-A-1	205.6	151	45	47	9	1	0	28	16	31	13	257	76	2	7	26	522	187	129.9	0.6	74.9	0.2	129.9	71.5	4.2
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*181.6*	*140*	*41*	*47*	*9*	*1*	*0*	*28*	*14*	*31*	*13*	*216*	*59*	*2*	*7*	*25*	*470*	*163*	*114.5*	*0.6*	*66.3*	*0.2*	*114.5*	*63.1*	*4.0*
Alternative COUT-B and Route Variations																									
COUT-B	216.0	172	72	62	20	1	0	28	14	46	22	286	93	5	3	22	598	248	136.2	0.5	79.1	0.2	136.2	71.3	8.5
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*192.0*	*161*	*68*	*62*	*20*	*1*	*0*	*28*	*12*	*46*	*22*	*245*	*76*	*5*	*3*	*21*	*546*	*224*	*120.8*	*0.5*	*70.5*	*0.2*	*120.8*	*62.9*	*8.3*
COUT-B-1	212.7	141	69	67	21	1	0	27	15	41	17	259	95	3	4	25	540	245	137.1	0.6	74.8	0.2	137.1	67.2	8.4
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*188.7*	*130*	*65*	*67*	*21*	*1*	*0*	*27*	*13*	*41*	*17*	*218*	*78*	*3*	*4*	*24*	*488*	*221*	*121.7*	*0.6*	*66.2*	*0.2*	*121.7*	*58.8*	*8.2*
COUT-B-2	214.2	149	76	67	21	1	0	27	16	45	22	263	98	3	4	27	556	263	134.9	0.6	78.5	0.2	134.9	70.3	9.0
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*190.2*	*138*	*72*	*67*	*21*	*1*	*0*	*27*	*14*	*45*	*22*	*222*	*81*	*3*	*4*	*26*	*504*	*239*	*119.5*	*0.6*	*69.9*	*0.2*	*119.5*	*61.9*	*8.8*
COUT-B-3	213.9	146	69	61	20	1	0	27	13	45	21	260	90	3	4	23	544	239	136.5	0.6	76.6	0.2	136.5	68.8	8.6
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*189.9*	*135*	*65*	*61*	*20*	*1*	*0*	*27*	*11*	*45*	*21*	*219*	*73*	*3*	*4*	*22*	*492*	*215*	*121.1*	*0.6*	*68.0*	*0.2*	*121.1*	*60.4*	*8.4*
COUT-B-4	214.2	146	72	67	21	1	0	27	15	43	21	262	94	3	4	26	550	252	137.1	0.6	76.3	0.2	137.1	68.3	8.8
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*190.2*	*135*	*68*	*67*	*21*	*1*	*0*	*27*	*13*	*43*	*21*	*221*	*77*	*3*	*4*	*25*	*498*	*228*	*121.7*	*0.6*	*67.7*	*0.2*	*121.7*	*59.9*	*8.6*
COUT-B-5	213.9	149	43	61	20	1	0	27	14	47	22	261	94	3	4	24	550	250	134.3	0.6	78.8	0.2	134.3	70.8	8.8
Colorado	*24.0*	*11*	*4*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*41*	*17*	*0*	*0*	*1*	*52*	*24*	*15.4*	*0.0*	*8.6*	*0.0*	*15.4*	*8.4*	*0.2*
Utah	*189.9*	*138*	*69*	*61*	*20*	*1*	*0*	*27*	*12*	*47*	*22*	*220*	*77*	*3*	*4*	*23*	*498*	*226*	*118.9*	*0.6*	*70.2*	*0.2*	*118.9*	*62.4*	*8.6*
Alternative COUT-C and Route Variations																									
COUT-C	209.8	75	12	39	1	0	0	14	7	29	14	281	74	3	0	14	438	123	149.5	0.4	59.9	0.0	149.5	57.3	3.0
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*185.0*	*62*	*9*	*39*	*1*	*0*	*0*	*14*	*5*	*29*	*14*	*238*	*58*	*3*	*0*	*12*	*382*	*102*	*132.9*	*0.4*	*51.7*	*0.0*	*132.9*	*49.3*	*2.8*
COUT-C-1	206.4	46	9	44	2	0	0	13	7	24	7	256	76	1	1	15	384	117	149.6	0.5	56.3	0.0	149.6	53.8	3.0
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.8*	*0.2*
Utah	*181.6*	*33*	*6*	*44*	*2*	*0*	*0*	*13*	*5*	*24*	*7*	*213*	*60*	*1*	*1*	*13*	*328*	*94*	*133.0*	*0.5*	*48.1*	*0.0*	*133.0*	*45.8*	*2.8*
COUT-C-2	207.9	54	16	44	2	0	0	13	8	28	12	260	79	1	1	17	400	135	147.4	0.5	60.0	0.0	147.4	56.9	3.6
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*		*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*183.1*	*41*	*13*	*44*	*2*	*0*	*0*	*13*	*6*	*28*	*12*	*217*	*63*	*1*	*1*	*15*	*344*	*112*	*130.8*	*0.5*	*51.8*	*0.0*	*130.8*	*48.9*	*3.4*
COUT-C-3 (Agency Preferred Alternative)	207.6	54	13	38	1	0	0	13	6	30	12	258	75	1	1	14	394	122	146.8	0.5	60.3	0.0	146.8	57.4	3.4
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*182.8*	*41*	*10*	*38*	*1*	*0*	*0*	*13*	*4*	*30*	*12*	*215*	*59*	*1*	*1*	*12*	*338*	*99*	*130.2*	*0.5*	*52.1*	*0.0*	*130.2*	*49.4*	*3.2*
COUT-C-4	207.9	54	13	44	2	0	0	13	7	28	12	268	75	1	1	16	408	126	148.3	0.5	59.1	0.0	148.3	56.0	3.6
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*183.1*	*41*	*10*	*44*	*2*	*0*	*0*	*13*	*5*	*28*	*12*	*225*	*59*	*1*	*1*	*14*	*352*	*103*	*131.7*	*0.5*	*50.9*	*0.0*	*131.7*	*48.0*	*3.4*
COUT-C-5	207.6	54	10	38	1	0	0	13	5	30	12	266	71	1	1	13	402	113	147.7	0.5	59.4	0.0	147.7	56.5	3.4
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*182.8*	*41*	*7*	*38*	*1*	*0*	*0*	*13*	*3*	*30*	*12*	*223*	*55*	*1*	*1*	*11*	*346*	*90*	*131.1*	*0.5*	*51.2*	*0.0*	*131.1*	*48.5*	*3.2*

TABLE 3-49
WATER RESOURCES IMPACT SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Water Resource Category (number)															Total Number of Waters Resources		Total Miles of Initial Impacts				Total Miles of Residual Impacts		
		Specially Designated Waters						Wetlands and Riparian Areas		Lotic Waters					Lentic Waters										
		Impaired Waters		Outstanding Waters		Forested Wetlands				Perennial Streams		Intermittent Streams		Spring/ Well											
		Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	Not Crossed	Crossed	Not Crossed	Crossed	Not Crossed	None	Low	Moderate	High	None	Low	Moderate
Alternatives COUT-H and COUT-I																									
COUT-H (Applicant Preferred Alternative)	200.6	79	18	23	4	0	0	10	9	26	18	263	67	0	0	16	401	132	138.7	0.8	61.1	0.0	138.7	59.5	2.4
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*175.8*	*66*	*15*	*23*	*4*	*0*	*0*	*10*	*7*	*26*	*18*	*220*	*51*	*0*	*0*	*14*	*345*	*109*	*122.1*	*0.8*	*52.9*	*0.0*	*122.1*	*51.5*	*2.2*
COUT-I	240.2	125	20	25	8	0	0	10	11	30	9	350	103	2	0	17	540	170	164.4	2.0	73.8	0.0	164.3	72.1	3.8
Colorado	*24.8*	*13*	*3*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*43*	*16*	*0*	*0*	*2*	*56*	*23*	*16.6*	*0.0*	*8.2*	*0.0*	*16.6*	*8.0*	*0.2*
Utah	*215.4*	*112*	*17*	*25*	*8*	*0*	*0*	*10*	*9*	*30*	*9*	*307*	*87*	*2*	*0*	*15*	*484*	*147*	*147.8*	*2.0*	*65.6*	*0.0*	*147.8*	*64.0*	*3.6*

3.2.4.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A (MV-6) is located on the Wyoming/Colorado state line in the Little Snake Subbasin (HUC 14050003) where the landscape is dominated by sagebrush, grassland, and pinyon-juniper habitats. The siting area is generally located on the south slope of the Powder Rim where water from the Cherokee Creek and Powder Wash drainage basins convey water south into the Little Snake River. The Powder Wash series compensation station siting area contains perennial and intermittent lentic and lotic systems, riparian areas, and wetlands.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 33,688-acre Powder Wash series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-47). Ground-disturbing activities resulting from construction, operation, and maintenance of the Powder Wash series compensation station could result in removal of wetland and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources could not be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B (MV-6) is located in Colorado in the Little Snake Subbasin (HUC 14050003) where the landscape is dominated by sagebrush, grassland, and pinyon-juniper habitats. The siting area is generally located within the Nine Mile Basin where the Shafer's Draw, Nipple Gulch, and South Nipple Gulch watersheds convey water to the Little Snake River. The Nine Mile Basin series compensation station siting area contains perennial and intermittent lentic and lotic systems and is situated along approximately 14 miles of the Little Snake River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 36,264 acre Nine Mile Basin series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-47). Ground-disturbing activities resulting from construction, operation, and maintenance of the Nine Mile Basin series compensation station could result in removal of wetland and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Siting Area C – Maybell

Affected Environment

Siting Area C (MV-6) is located in Colorado in the Little Snake (HUC 14050003) and Lower Yampa (HUC 14050002) subbasins where the landscape is dominated by sagebrush, grassland, pinyon-juniper habitats, and agricultural land. The Maybell series compensation station siting area contains perennial and intermittent lentic and lotic systems, wetlands, riparian areas, and specially designated waters. The siting area is situated along approximately six miles of the Yampa River where the river is listed as an impaired water on the CWA Section 303(d) list. The siting area is located within watersheds which convey water to the Yampa River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 37,859 acre Maybell series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-47). Ground-disturbing activities resulting from construction, operation, and maintenance of the Maybell series compensation station could result in removal of wetland and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D (MV-6) is located in Colorado in the Lower Yampa (HUC 14050002) subbasin where the landscape is dominated by sagebrush, grassland, and agricultural land. The Bell Rock series compensation station siting area contains perennial and intermittent lentic and lotic systems, wetlands, riparian areas, and a spring. The siting area is situated along approximately 1.5 miles of the Yampa River where the river is not listed as an impaired water on the CWA Section 303(d) list. The siting area is located within watersheds which convey water to the Yampa River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 26,976 acre Bell Rock series compensation station siting area is included in the disturbance analysis for Alternative WYCO-D, and Route Variation WYCO-D-1 (Table 3-47). Ground-disturbing activities resulting from construction, operation, and maintenance of the Bell Rock series compensation station could result in removal of wetland and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G (MV-6) is located in Utah in the Lower Green (HUC 14060008) subbasin just west of the town of Green River. The local landscape is dominated by sagebrush and salt desert. The Green River series compensation station siting area contains intermittent lotic systems, wetlands, and riparian areas. Saleratus Wash supports a large contiguous wetlands and riparian area. Cottonwood and Fivemile washes would also be affected but these drainages appear to receive very little precipitation and thus have little riparian vegetation associated with them. The drainage basins within the siting area generally convey water east into the Green River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 21,135 acre Green River series compensation station siting area is included in the disturbance analysis for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E (Table 3-48). Ground-disturbing activities resulting from construction, operation, and maintenance of the Green River series compensation station could result in removal of upland, wetland, and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby water resources. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources could not be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F (MV-6) is located in Utah in the Duchesne subbasin (HUC 14060003) just south of the town of Roosevelt. The local landscape is dominated by sagebrush, salt desert, and predominately by agriculture and residential areas. The Roosevelt series compensation station siting area contains a large number of perennial and intermittent lentic lotic systems including Dry Gulch, Cottonwood, and Montes creeks, Lateral C canal, the Uinta River, Bottle Hollow Reservoir, associated riparian areas, and many areas supporting wetlands. The Uinta River, where crossed by the Roosevelt series compensation station siting area is listed as an impaired water on the CWA Section 303(d) list. Additionally, the station series compensation station siting area is located in proximity to residential areas and agricultural communities which are currently utilizing water resources for irrigation and drinking water. The drainage basins within the siting area generally convey water east into the Uinta River and shortly thereafter, south into the Duchesne River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 36,624 acre Roosevelt series compensation station siting area is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1 (Table 3-49). Ground-disturbing activities resulting from construction, operation, and maintenance of the Roosevelt series compensation station could result in removal of upland, wetland, and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby water resources. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E (MV-6) is located in Utah in the Lower White subbasin (HUC 14050007). The local landscape is sparsely vegetated and semi-arid where vegetation such as sagebrush and salt desert shrubs are dominant. The Bonanza series compensation station siting area contains only a few intermittent lentic and lotic systems and the main drainage basin is Coyote Wash. The drainage basins within the siting area generally convey water east or west into the White River.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 31,802 acre Bonanza series compensation station siting area is included in the disturbance analysis for Alternative COUT-C and route variations (Table 3-49). Ground-disturbing activities resulting from construction, operation, and maintenance of the Bonanza series compensation station could result in removal of upland vegetation, destabilization and/or compaction of soils, and subsequent erosion which could discharge sediment into nearby water resources. A detailed description of potential direct, indirect, adverse, and beneficial impacts on water resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the proposed Action and Selective Mitigation Measures 1, 2, 3, 4, 5, 7, 11, and 13; impacts on water resources would be mostly avoided. Where impacts on water resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.5 Vegetation

3.2.5.1 Introduction and Regulatory Framework

This section describes the existing condition of vegetation resources in the study area and addresses potential effects on vegetation resources that could result from construction, operation, and maintenance of the Project.

Implementation of the Project would be consistent with statutes, regulations, plans, programs, and policies of affiliated tribes, federal agencies, and state and local governments.

3.2.5.1.1 Regulatory Framework

Federal

Federal legislation applicable to vegetation resources in the alternative route study corridors listed in this section includes FLPMA, Executive Order 13112, the Carson-Foley Act, and the NFMA of 1976. Pertinent Instructional Bulletins, IMs, RMPs, LRMPs, and federally issued resource management manuals are also listed in this section.

- FLPMA (43 U.S.C. 1701) as amended, consolidates and articulates BLM and USFS management responsibilities and governs most uses of federal lands, including authorization to grant or renew rights-of-way. In accordance with FLPMA, BLM, and USFS must make land-use decisions based on principles of multiple use and sustained yield. As such, a grant of right-of-way must be limited to its necessary use and must contain terms and conditions that reflect the agencies' management responsibilities under FLPMA, including minimizing impacts on fish and wildlife habitat.
- Executive Order 13112 requires that federal agencies prevent the introduction and spread of invasive species, detect and respond rapidly to control such species, monitor invasive species populations, and restore native species and habitat conditions in ecosystems that have been invaded. In addition, the order requires a federal agency "not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species."
- The Carlson-Foley Act (43 U.S.C. 1241) directs federal land-management agencies to destroy noxious weeds growing on land under their jurisdiction, and provides a legal framework for reimbursement of expenses to state or local agencies for weed control on federal land.
- The NFMA, as amended, and its implementing regulations under 36 CFR 219, consolidate and articulate USFS management responsibilities for lands and resources of the National Forest System. The NFMA requires that each national forest develop a management program based on multiple-use, sustained-yield principles and implement a land-management plan for each unit of the National Forest System. The implementing regulations at the time the current forest plans were approved required the identification of MIS (36 CFR 219.19). MIS were selected because their population changes were believed to indicate the effects of management activities on habitats or other species of selected major biological communities or water quality. The land-management plan established objectives for the maintenance and improvement of habitat for the MIS.

- USFS Manual 2900, Invasive Species Management, sets forth National Forest System policy, responsibilities, and direction for the prevention, detection, control, and restoration of effects from aquatic and terrestrial invasive species (including vertebrates, invertebrates, plants, and pathogens).
- EPA Executive Order 11990, Protection of Wetlands, ordered in 1977, provides additional support to NEPA, as amended (42 U.S.C. 4321 et seq.), to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.
- Federal Noxious Weed Act of 1974 (P.L. 93-629) (76 U.S.C. 2801 et seq.) directs the management of undesirable plants on federal lands, including prohibiting the transport of noxious weeds into the U.S. and between states. This legislation also outlines how noxious weed infestations are to be quarantined and controlled on federal lands.
- The BLM Washington Office Instructional Bulletin (WO-IB) 2012-097 states current BLM policy for any cutting or removal of timber, trees, or vegetative resources, including such resources located in the clearing limits of rights-of-way.
- BLM RMPs and Management Framework Plans for Wyoming, including Rawlins Field Office (2008); for Colorado, including White River (1997, as amended), Little Snake (2011), and Grand Junction (1987, as amended); for Utah, including Richfield (2008), Fillmore (1987), Moab (2008), Price (2008) and Vernal (2008) Field Offices, and Salt Lake District (1990), specify regulations and goals for management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend. Many of these documents also describe the locations and approximate quantities of known noxious weed species in the jurisdictional boundaries of the field offices.
- The BLM Utah-IM-2005-091 provides the Utah BLM Riparian Management Policy aimed at identifying, maintaining, restoring, and/or improving riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits and overall watershed protection while allowing for reasonable resource uses.
- BLM Manual 1740-1 – *Integrated Vegetation Management* (2008) and BLM Manual 1740-2 – *Renewable Resource Improvement and Treatment Guidelines and Procedures* (1987) outline policies, objectives and standards focused primarily on planning, analyzing, constructing, maintaining, replacing, or modifying renewable resource improvements and treatments such as for forestry, invasive species, and range management.
- LRMPs, for the Ashley (1986, as amended), Manti-La Sal (1986, as amended), and Uinta (2003, as amended) National Forests identify goals for forest health and constraints on resource uses to meet these goals.

State

Wyoming

- Wyoming Weed and Pest Control Act (WWPC) (Title 11, Chapter 5, Article 1) officially designates the authority of the State of Wyoming to require the control of designated pests and weeds.

Colorado

- Colorado Noxious Weed Act (Title 35 Article 5.5) officially designates the authority of the State of Colorado to require the control of designated pests and weeds.

Utah

- Utah Noxious Weed Act (Rule R68-9) officially designates the list of weeds as noxious for the State of Utah, equipment capable of disseminating those weeds, and treatments considered to prevent dissemination of weed seeds or parts of noxious weed plants that could cause new growth by contaminated equipment, as per the authority vested in the Commissioner of Agriculture and Food under Section 4-17-3.

3.2.5.2 Issues Identified for Analysis

Table 3-50 lists the issues identified for analysis of impacts on vegetation resources. These issues were identified during scoping and in coordination with agency personnel.

TABLE 3-50
VEGETATION ISSUES IDENTIFIED FOR ANALYSIS

Issue Identified	Analysis Considerations
Potential spread of noxious weeds: ▪ New surface disturbance, which creates conditions for noxious weed invasion ▪ Project activities in areas already infested by noxious weeds, potentially increasing transportation of propagules	▪ Extent of land potentially disturbed by Project construction, operation, and maintenance activities ▪ Extent of noxious weed-infested land potentially disturbed by Project construction, operation, and maintenance activities
Loss and fragmentation of native vegetation communities	▪ Extent of native vegetation communities potentially disturbed by Project construction, operation, and maintenance activities ▪ Ability of affected vegetation communities to recover following reclamation in context of ecological or climate constraints
Compliance with specific forest plan standards and guides	Site-specific forest plan standards referenced with potential Project construction, operation, and maintenance activities

3.2.5.3 Regional Setting

The Project area is in the Wyoming Basin, Southern Rockies, Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range Level III Ecoregions (EPA 2010b). The Project area is situated in the Platte River, Colorado River, and Great Basin watersheds and traverses a number of prominent landform features. The Wasatch Range runs north-to-south near the westernmost end of the Project area, the Uinta Mountains are located in the northwest section, and the Rocky Mountains are along the easternmost end. Elevations in the Project area range from approximately 3,838 to 13,478 feet (1,190 to 3,730 meters) above mean sea level.

Characteristics of the ecoregions crossed by the Project are provided in the following paragraphs, which include lists of characteristic species, as adapted from *North American Terrestrial Ecoregions—Level III* (Commission for Environmental Cooperation 2011).

The Wyoming Basin Ecoregion is in the northernmost extent of the Project area, mainly in Sweetwater and Carbon counties in Wyoming, Moffat and Routt counties in Colorado, and Daggett County in Utah. The ecoregion is classified as a cold desert, with warm to hot summers and cold winters. Major rivers in the Wyoming Basin include the North Platte and Yampa rivers. Topographically, this ecoregion is an extensive intermontane basin with scattered low mountains and hills. Arid shrublands and grasslands are the dominant vegetation types throughout. Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), black sagebrush (*Artemisia nova*), prairie sagewort (*Artemisia frigida*), rabbitbrush (*Chrysothamnus* and *Ericameria* spp.), western wheatgrass (*Pascopyrum smithii*), needle and thread

(*Hesperostipa comata*), blue grama (*Bouteloua gracilis*), and prairie junegrass (*Koeleria macrantha*) are the dominant vegetation species in sagebrush steppes. Greasewood (*Sarcobatus vermiculatus*), Gardner's saltbush (*Atriplex gardneri*), shadscale saltbush (*Atriplex confertifolia*), and bud sagebrush (*Picrothamnus desertorum*) are the dominant species in desert shrublands at lower elevations. Big sagebrush (*Artemisia tridentata*) and pinyon- (*Pinus* spp.) juniper (*Juniperus* spp.) woodland predominate at higher elevations.

The Southern Rockies Ecoregion is along the eastern extent of the Project area mainly in Carbon County in Wyoming and Moffat, Routt, and Rio Blanco counties in Colorado. Although small areas of the Project area do overlap, no alternative route alignments cross this ecoregion. The ecoregion is classified as part of the Western Cordillera and has warm to cool summers and severe winters (deep snowpack occurs at high elevations) with no pronounced dry season. Topographically, this ecoregion is composed of rugged mountains and extreme elevational changes. Lowest elevation extents are generally vegetated with heavily grazed grasslands and shrublands, with sagebrush (*Artemisia* spp.), mountain mahogany (*Cercocarpus* spp.), pinyon-juniper, or Gambel oak (*Quercus gambelii*) woodlands being common throughout. Juniper-oak, Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), and quaking aspen woodlands occur at low to mid-elevations. Coniferous forests with Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and quaking aspen occur at middle to high elevations. Alpine vegetation communities occur at high elevations, with cushion plants, sedges, and stunted spruce (*Picea* spp.), fir (*Abies* spp.), and pine (*Pinus* spp.) being common.

The Colorado Plateaus Ecoregion, which encompasses the majority of the central part of the Project area, is mainly in Moffat, Rio Blanco, Garfield, and Mesa counties in Colorado and Uintah, Duchesne, Carbon, Emery, and Grand counties in Utah. The ecoregion is a cold desert and has a dry, mid-latitude steppe climate marked by hot summers with low humidity and cool to cold dry winters. Rivers flowing through the Colorado Plateaus include the Green, Duchesne, Lake Fork, Uinta, and White rivers. The Colorado Plateau Ecoregion is characterized by its diverse topography, which includes benches, mesas, buttes, salt valleys, cliffs, and canyons formed from thick layers of highly erodible sedimentary rock. Vegetation of the area is likewise variable. Arid grasslands and shrublands are common at the lowest elevations with blackbrush (*Coleogyne ramosissima*), shadscale saltbush, fourwing saltbush (*Atriplex canescens*), and galleta grass (Pleuraphis spp.) being the dominant vegetation species. Higher valleys are predominantly vegetated with Wyoming big sagebrush, black sagebrush, and pinyon-juniper woodlands. At the highest elevations, Gambel oak, mountain mahogany, and Douglas-fir are common.

The Wasatch and Uinta Mountains Ecoregion is near the westernmost section of the Project area in Wasatch, Utah, Sanpete, Uintah, Carbon, Emery, Daggett, Duchesne, and Juab counties in Utah. Project alternative routes do not occur in Uintah, Daggett, and Duchesne counties in this ecoregion. Climate of this ecoregion, which is part of the Western Cordillera, is characterized by severe winters in which some mountain peaks and canyons receive large amounts of powder snowfall and avalanches commonly occur. Summers are warm to hot without a pronounced dry season. The Sevier River drains the Pahvant Range, San Pitch Mountains, and Wasatch Plateau before it flows into the Central Basin and Range Ecoregion. Topography of this ecoregion is primarily high mountains with narrow crests interspersed with high-elevation valleys and dissected plateaus. Sagebrush, grasses, and pinyon-juniper woodlands occur in valleys, and these species as well as maple (*Acer* spp.), Gambel oak, and ponderosa pine are dominant at middle elevations.

The Central Basin and Range Ecoregion is in Juab and Utah counties in Utah and includes the Clover Substation and terminus of all Project alternative routes. The ecoregion is a cold desert and has a dry, hot summers and mild winters. Most of the rainfall occurs during convective thunderstorms in the warm season; in winter, precipitation is mostly in the form of snowfall. Topography of this ecoregion is characterized by xeric basins, salt flats, and scattered low and high mountains. Wyoming big sagebrush, shadscale saltbush, winterfat (*Krascheninnikovia lanata*), black sagebrush, rabbitbrush, jointfir (*Ephedra*

spp.), Indian ricegrass (*Achnatherum hymenoides*), and squirreltail (*Elymus elymoides*) are common in xeric basins. In highly saline areas, greasewood, Nuttall's saltbush (*Atriplex nuttallii*), seepweed (*Suaeda* spp.), and alkali sacaton (*Sporobolus airoides*) become dominant. Lower mountains are vegetated with singleleaf pinyon (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), sagebrush, antelope bitterbrush (*Purshia tridentata)*, serviceberry (*Amelanchier* spp.), snowberry (*Symphoricarpos* spp.), and bluebunch wheatgrass (*Pseudoroegneria spicata*). High mountains may contain Douglas-fir, white fir (*Abies concolor*), limber pine (*Pinus flexilis*), whitebark pine (*Pinus albicaulis*), and quaking aspen.

3.2.5.4 Study Methodology

3.2.5.4.1 Inventory

Vegetation Communities

A total of 86 National Land Cover Gap Analysis Project (GAP) land-cover categories identified by the GAP dataset[2] occur in the Project area (USGS 2010b) (refer to Appendix E for detailed descriptions of these land-cover categories). For the purposes of this EIS, the 86 GAP land-cover categories were consolidated and reclassified into 16 primary vegetation communities (Appendix E, Table E-1) based on similarities in species composition, vegetative structure, and topographic positioning.

Each vegetation community is described below and illustrated in MV-7. These descriptions are adapted from NatureServe's Ecological System classification descriptions (NatureServe 2012a) for the GAP land-cover categories in each vegetation community (Appendix E, Table E-1). Descriptions of land-cover categories in the Agriculture and Developed/Disturbed vegetation communities were adapted from the National Land Cover Dataset 2001 legend (Homer et al. 2004). Full descriptions of land-cover categories in each primary vegetation community can be found in Appendix E.

Agriculture

This vegetation community is composed of the Cultivated Cropland and Pasture/Hay GAP land-cover categories. Agriculture lands are considered those used for the production of annual and perennial crops for human consumption, livestock grazing, or the production of seed or hay crops. This vegetation community is generally found in valley bottoms near rural and suburban areas.

Alpine

This vegetation community is composed of the North American Alpine Ice Field, Rocky Mountain Alpine Bedrock and Scree, Rocky Mountain Alpine Dwarf-Shrubland, Rocky Mountain Alpine Fell-Field, Rocky Mountain Alpine-Montane Wet Meadow, and Rocky Mountain Dry Tundra GAP land-cover categories. These land-cover categories are found at the highest elevations above the tree line in mountain ranges. These sites are generally exposed to wind erosion and experience a long-term or relatively permanent cover of snow and ice. Many areas are barren with a high cover of rock and scree. Short growing seasons and extreme climatic conditions limit vegetation growth; plant species are generally dwarf or mat-forming forbs, graminoids, lichens, and shrubs.

[2]The GAP dataset combines data from several regional land cover projects to create a seamless data set across the contiguous United States. Within the Project area, data is compiled from both the Northwest Regional GAP and the Southwest Regional Gap Analysis Project (USGS 2010b, c). Both datasets were developed using satellite imagery and other spatial datasets to model vegetation (Lowry et al. 2005; University of Idaho 2012).

Aspen

This vegetation community is composed of the Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland and Rocky Mountain Aspen Forest and Woodland GAP land-cover categories. This vegetation community occurs in montane areas and is dominated by quaking aspen with less than a 25-percent conifer species component. The distribution of this land-cover type is limited by soil moisture and the growing season. Aspen woodlands are found across the western U.S. but are especially common in the mountains of the Colorado Plateau, Rocky Mountains, and the Great Basin. They occur on clay-rich, moist soils on mountain slopes. The shrubs, herbs, and grasses found in aspen forests are very diverse. In some areas, quaking aspen forests are a mix of deciduous and coniferous trees with one or more conifer species such as ponderosa pine, Douglas-fir, subalpine fir, Engelmann spruce, or lodgepole pine also occurring. This vegetation community originates and is maintained by stand-replacing disturbances, such as avalanches, crown fire, insect outbreak, windthrow, and vegetation management practices.

Barren/Sparsely Vegetated

This vegetation community is composed of the Colorado Plateau Mixed Bedrock Canyon and Tableland, Inter-Mountain Basins Active and Stabilized Dune, Inter-Mountain Basins Cliff and Canyon, Inter-Mountain Basins Playa, Inter-Mountain Basins Shale Bad Land, Rocky Mountain Cliff, Canyon and Massive Bedrock, and Western Great Plains Cliff and Outcrop GAP land-cover categories. This diverse group of land-cover categories is generally described as having a very low cover of vegetation and a high cover of bare soil, rock outcrops, exposed bedrock, or sand. These land-cover types are subject to erosion, low precipitation, saline or sodic soils, coarse-textured and shifting substrates, or other extreme abiotic conditions that create barriers to vegetation establishment. Sparse vegetation is often found only in crevices, rock cracks, and pockets in exposed rock where water and wind-blown soil accumulates.

Big Sagebrush

This vegetation community is composed of the Inter-Mountain Basins Big Sagebrush Shrubland, Inter-Mountain Basins Big Sagebrush Steppe, and Inter-Mountain Basins Montane Sagebrush Steppe GAP land-cover categories. The big sagebrush vegetation community occurs on well-drained, nonalkaline soils at middle elevations and is dominated by basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), Wyoming big sagebrush, and/or mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Typical co-dominant species include antelope bitterbrush, mountain snowberry (*Symphoricarpos oreophilus*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), and rubber rabbitbrush (*Ericameria nauseosa*). Big sagebrush occurs in valleys and foothills throughout the study corridors. Varied native bunchgrasses almost always occur when not displaced by cheatgrass (*Bromus tectorum*). Higher in the mountains, big sagebrush shrublands become very wildflower rich and often occur in a matrix with montane and subalpine woodlands. In many areas, wildfires can maintain an open herbaceous-rich steppe condition.

Developed/Disturbed

This vegetation community is composed of the Developed, High, Medium, and Low Intensity; Developed, Open Space; Disturbed, Non-specific; Disturbed/Successional, Recently Chained Pinyon-Juniper; Quarries, Mines, Gravel Pits and Oil Wells; Recently Burned; and Recently Logged Areas GAP land-cover categories. These land-cover types are modified either for human use (e.g., housing, parks, and commercial/industrial developments), or through human activities (e.g., chaining, burning, or logging of vegetation; quarrying or mining of landscapes).

Grassland

This vegetation community is composed of the Inter-Mountain Basins Semi-Desert Grassland, Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland, Northwestern Great Plains Mixed Grass Prairie, Rocky Mountain Subalpine-Montane Mesic Meadow, Southern Rocky Mountain Montane-Subalpine Grassland, and Western Great Plains Sand Prairie GAP land-cover categories. Grasslands are found on a variety of landforms, generally in low precipitation zones. Distribution and vegetative composition of this vegetation community is generally influenced by livestock grazing and fire activity.

Invasive

This vegetation community is composed of the Introduced Upland Vegetation-Annual Grassland; Introduced Upland Vegetation-Perennial Grassland and Forbland; and Introduced Upland Vegetation-Treed GAP land-cover categories as well as mapped noxious weed occurrences supplied by from BLM and USFS Field Offices and Ranger Districts. This vegetation community is dominated by invasive non-native grass and forb species. The Introduced Upland Vegetation-Treed GAP land-cover type is a spontaneous, self-perpetuating non-native forest not immediately the result of planting, cultivation, or human maintenance. Invasive vegetation communities occur throughout the study corridors.

Montane Forest

This vegetation community is composed of the Middle Rocky Mountain Montane Douglas-fir Forest and Woodland, Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, Northern Rocky Mountain Mesic Montane Mixed Conifer Forest, Rocky Mountain Lodgepole Pine Forest, Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland, Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland, Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland, Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland, and Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland GAP land-cover categories. These land-cover categories exist in a wide range of aspects and moisture regimes. The species compositions in these land-cover categories are diverse, but all are dominated by one or more coniferous tree species such as Douglas-fir, ponderosa pine, lodgepole pine, Engelmann spruce, or subalpine fir.

Mountain Shrub

This vegetation community is composed of the Harvested Forest-Shrub Regeneration, Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland, Northern Rocky Mountain Montane-Foothill Deciduous Shrubland, Northern Rocky Mountain Subalpine Deciduous Shrubland, Rocky Mountain Gambel Oak-Mixed Montane Shrubland, and Rocky Mountain Lower Montane-Foothill Shrubland GAP land-cover categories. These land-cover categories are dominated by woody shrub species such as curl-leaf mountain mahogany (*Cercocarpus ledifolius*), alderleaf mountain mahogany (*Cercocarpus montanus*), antelope bitterbrush, Gambel oak, choke cherry (*Prunus virginiana*), ninebark (*Physocarpus* spp.), hawthorn (*Crataegus* spp.), mock orange (*Philadelphus* spp.), smooth sumac (*Rhus glabra*), and serviceberry (*Amelanchier* spp.). These shrublands generally occur on rocky outcrops, steep slopes, and toeslopes with shallow, rocky soils that limit the establishment of forests and woodlands.

Pinyon-Juniper

This vegetation community is composed of the Colorado Plateau Pinyon-Juniper Shrubland, Colorado Plateau Pinyon-Juniper Woodland, Great Basin Pinyon-Juniper Woodland, Inter-Mountain Basins Juniper Savanna, Rocky Mountain Foothill Limber Pine-Juniper Woodland, and Southern Rocky Mountain Pinyon-Juniper Woodland GAP land-cover categories. Two-needle pinyon (*Pinus edulis*), singleleaf

pinyon, and Utah juniper are the most common trees in these land-cover categories. Understory and shrub species vary by region, but include black sagebrush, big sagebrush, green rabbitbrush (*Chrysothamnus viscidiflorus*), blackbrush, sagebrush, mountain mahogany, cliffrose (*Purshia* spp.), antelope bitterbrush, and Gambel oak.

Ponderosa Pine

This vegetation community is composed of the Northern Rocky Mountain Foothill Conifer Wooded Steppe, and Southern Rocky Mountain Ponderosa Pine Woodland GAP land-cover categories. This vegetation community occurs on dunes, rocky ridges, scablands, or broken rock where conditions prevent a typical forest or woodland from developing, but enough trees become established to form a savanna or open woodland. Ponderosa pine is the predominant conifer with Douglas-fir, two-needle pinyon, and juniper often present in the tree canopy.

Riparian

This vegetation community is composed of the Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Introduced Riparian and Wetland Vegetation, Northwestern Great Plains Riparian, Rocky Mountain Bigtooth Maple Ravine Woodland, Rocky Mountain Lower Montane Riparian Woodland and Shrubland, Rocky Mountain Subalpine-Montane Riparian Shrubland, Rocky Mountain Subalpine-Montane Riparian Woodland, Western Great Plains Floodplain, and Western Great Plains Riparian Woodland and Shrubland GAP land-cover categories as well as NWI-mapped riparian areas. When NWI data coincided with GAP data, both data sets were used. NWI data was used in areas where GAP data reported upland land-cover types and NWI reported wetland or riparian cover types. GAP data were used in areas where both NWI and GAP reported wetland or riparian land-cover types, or where GAP reported wetland or riparian cover types and NWI reported upland vegetation.

The GAP land-cover categories used to define the riparian vegetation community occur in varying landscape situations but are always adjacent to flowing water such as streams and rivers. Common trees in riparian areas are narrowleaf cottonwood (*Populus angustifolia*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), alder (*Alnus* spp.), birch (*Betula* spp.), Fremont cottonwood (*Populus fremontii*), various willows (Goodding's [*Salix gooddingii*], arroyo [*S. lasiolepis*], Booth's [*S. boothii*], narrowleaf [*S. exigua*], Lemmon's [*S. lemmonii*], yellow [*S. lutea*]) and conifers such as white fir and Douglas-fir. Shrubs such as silver sagebrush (*Artemisia cana*), rose (*Rosa* spp.), snowberry, and redosier dogwood (*Cornus sericea*) are common understory species. Maple ravine woodland riparian areas are dominated by bigtooth maple (*Acer grandidentatum*) but may include mixed stands codominated by Gambel oak, scattered conifers, box elder (*Acer negundo*) or quaking aspen.

Shrub/Shrub Steppe

This vegetation community is composed of the Colorado Plateau Blackbrush-Mormon-tea Shrubland, Colorado Plateau Mixed Low Sagebrush Shrubland, Great Basin Xeric Mixed Sagebrush Shrubland, Inter-Mountain Basins Greasewood Flat, Inter-Mountain Basins Mat Saltbush Shrubland, Inter-Mountain Basins Mixed Salt Desert Scrub, Inter-Mountain Basins Semi-Desert Shrub Steppe, Southern Colorado Plateau Sand Shrubland, and Wyoming Basins Dwarf Sagebrush Shrubland and Steppe GAP land-cover categories. These land-cover types generally occur in drier sites with shallow, rocky soils such as alluvial fans or hillslopes. Many shrub species occur in these land-cover types, including blackbrush, Mormon tea (*Ephedra viridis*), spiny hopsage (*Grayia spinosa*), Bigelow sagebrush (*Artemisia bigelovii*), Wyoming big sagebrush, little sagebrush (*Artemisia arbuscula*), shadscale saltbush, jointfir, goldenbush (*Ericameria* spp.), Shockley's desert-thorn (*Lycium shockleyi*), bud sagebrush, greasewood, and horsebrush (*Tetradymia* spp.).

Water

This vegetation community is composed of the Open Water (Fresh) GAP land-cover category. This category is all areas of open water with generally less than 25 percent cover of vegetation or soil. Specifically, this refers to inland waters of streams, rivers, ponds and lakes.

Wetland

This vegetation community is composed of the Great Plains Prairie Pothole, Inter-Mountain Basins Interdunal Swale Wetland, North American Arid West Emergent Marsh, Rocky Mountain Subalpine-Montane Fen, Western Great Plains Closed Depression Wetland, Western Great Plains Open Freshwater Depression Wetland, and Western Great Plains Saline Depression Wetland GAP land-cover categories as well as NWI-mapped wetland areas. These wetland-cover types are highly diverse, but all are inundated or saturated during a significant portion of the growing season and support hydrophytic vegetation and/or hydric soil conditions.

Noxious Weeds

In addition to the GAP land-cover categories used to define invasive vegetation communities in the Project area, distribution information available from BLM field office management documents, where available, was used to determine the presence of noxious weeds in the Project area. Noxious weed information for each state is summarized in the following subsections.

Wyoming

- Wyoming Designated Noxious Weeds (Wyo. Stat. 11-5-102 [a][xi]) and Prohibited Noxious Weeds (Wyo. State. 11-12-104) lists designate 25 noxious weed species (Appendix E, Table E-2). These species are managed under the WWPC Act (Title 11, Chapter 5, Article 1). The Wyoming BLM also recognizes and adheres to control of weeds listed on the National BLM Invasive Species of Concern list.
- BLM Rawlins Field Office – The BLM Rawlins Field Office RMP EIS confirms the presence of 18 of the 25 Wyoming state-listed noxious weeds in the field office (BLM 2008b) (Appendix E, Table E-2). These species on public lands in Wyoming are managed under the Rawlins Field Office *Noxious Weed Prevention Plan* (BLM 2008b). The current, untreated, weed-infested area is estimated at 20,000 acres, but most of the Rawlins Field Office has not been inventoried for noxious and invasive species (BLM 2008b).

Colorado

- The official Colorado state list of noxious weeds consists of 76 species (Colorado Department of Agriculture 2012) (Appendix E, Table E-3). No additional noxious weeds are designated for the individual Colorado counties that occur in the Project area.
- BLM Little Snake Field Office – In the field office area, especially in the last 10 years, there has been an increase in noxious and invasive weeds, including salt cedar, halogeton, Canada thistle, and cheatgrass. These problems are most evident in the oil and gas production fields and other locations where native vegetation has been disturbed (BLM 2011b). Specific information about noxious weed species presence in this field office is not currently available.
- BLM White River Field Office – A key element of management on the White River Field Office is the preventive measure of designating weed-free zones where few or no noxious weeds presently occur. The weed free zones are estimated to comprise approximately 19 percent of the White River Field Office and are located in the north-central and northeast portions of the White

River Field Office (BLM 1997). Specific information about noxious weed species presence in this field office is not currently available.

- BLM Grand Junction Field Office – The Grand Junction Field Office is in the process of producing an updated RMP. Detailed information about noxious weed occurrence is not currently available for this field office; however, noxious weed inventories have been conducted and a large-scale weed map has been prepared (BLM 2012a). According to this map, at least 20 of the 72 Colorado state-listed noxious weed species are currently known in the field office (BLM 2012a) (Appendix E, Table E-3).

Utah

- The official state list of noxious weeds consists of 27 species (Utah Department of Agriculture and Food 2010) (Appendix E, Table E-4). Carbon, Duchesne, Grand, Juab, and Uintah counties add an additional four designated noxious weed species (Utah Department of Agriculture and Food 2009) (Appendix E, Table E-4).
- BLM Vernal Field Office – There are more than 23,000 acres of noxious and undesirable weeds in the Vernal Field Office (BLM 2008b). The *Vernal Field Office Proposed Resource Management Plan and Final Environmental Impact Statement* confirms the presence of 16 of the 27 state-listed noxious weed species and one of the county-listed species in the field office (BLM 2008b) (Appendix E, Table E-4). Cheatgrass, though not a state-listed noxious weed, is a major concern in the field office; approximately 55,700 acres of land in the field office have more than 60 percent cheatgrass cover (BLM 2008b).
- BLM Moab Field Office – The Moab Field Office is located in arid lands of the Colorado Plateau. There are 35 weed species of primary concern to the Moab Field Office, 21 which are state-listed noxious weeds and 2 which are county-listed noxious weeds (BLM 2008c) (Appendix E, Table E-4). Most of the noxious and invasive plants in the Moab Field Office are concentrated in wetland and riparian areas (BLM 2008c).
- BLM Price Field Office – The Price Approved RMP (BLM 2008d) includes management prescriptions for 14 noxious weeds identified as occurring in the field office during the planning process (BLM 2004a) (Appendix E, Table E-4). Eleven of these species are Utah state-listed noxious weeds, two are county-listed noxious weeds for counties within the Project area, and one is a county-listed noxious weed for counties outside the Project area.
- BLM Salt Lake Field Office – The Project would cross only very small areas of public land in the extreme southeast corner of the Salt Lake Field Office. No information on noxious weed occurrence in this area is currently available.
- BLM Richfield Field Office – Eleven species from the state list are present in the Richfield Field Office (BLM 2008e) (Appendix E, Table E-4). This field office also monitors for county-listed noxious weeds and BLM-designated “new and invading weeds” and other species deemed to have the potential to invade field office ecosystems. Other non-listed species, such as cheatgrass, are likewise given consideration when making management decisions.
- BLM Fillmore Field Office – The Fillmore Field Office has documented the presence of 10 weeds on the Utah state noxious weed list. Noxious weed inventories have been completed throughout the field office in both Millard and Juab counties. There are approximately 2,000 acres treated for noxious and invasive weeds in the Fillmore Field Office annually. During 1996 and 1997, Squarrose knapweed was estimated to be present on 200,000 acres in Juab, Utah, and Tooele counties (Probert 2013).

- National Forests – The Ashley, Manti-La Sal, and Uinta National Forests adhere to the Utah state list of noxious weed species (T. Miller 2013). Several Utah state-listed noxious weeds are known to occur within USFS boundaries in the Project area (Appendix E, Table E-5).

3.2.5.4.2 Temporal and Geographic Scope of Analysis

The geographic scope of analysis for vegetation resources is the 2-mile-wide study corridor around Project alternative routes. Short-term impacts are defined as those anticipated to begin during construction and dissipate in 5 years or less. Long-term impacts are defined as those that would begin during construction and persist through the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of transmission line (e.g., tower foundations) may be permanent.

3.2.5.4.3 Impact Assessment and Mitigation Planning

The methodology used to assess potential impacts on vegetation resources for the purpose of interdisciplinary comparison of alternative routes is presented in Section 2.5.1. In general, the analysis included (1) identifying the types of potential effects on vegetation resources that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) assessing intensity and extent of initial impacts on vegetation resources present in the study corridors (3) identifying appropriate selective mitigation measures (Table 2-13) for minimizing some potential adverse effects and determining specific areas where selective mitigation measures should be applied, and (4) disclosing intensity and extent of potential residual impacts on vegetation resources (i.e., impacts anticipated after application of selective mitigation measures). Design features incorporated in the Proposed Action to achieve environmental protection (Table 2-8) were considered when assessing both initial and residual impacts. Additional discussion of the methods used in analyzing effects of the Project on vegetation resources to support interdisciplinary comparison of alternative routes are discussed in the Effects Analysis section.

Supplemental analyses were necessary to address some of the issues raised by the public and the agencies during scoping. Quantitative or qualitative analyses were performed, depending on information available, to evaluate potential impacts of the Project on vegetation resources, or to meet the requirements of relevant law, regulation, or policy. The methods for these supplemental analyses are discussed in the Effects Analysis section.

Types of Potential Effects

The construction, operation, and maintenance of the Project would result in both direct and indirect effects on vegetation resources, which are described in the following sections.

Direct Effects

Direct adverse impacts would occur in any area where native or desirable vegetation communities would be removed or damaged due to Project activities. In the short term, removal of vegetation could increase soil erosion (Quinton et al. 1997) and increase the susceptibility of an area to colonization by invasive species (Hobbs and Huenneke 1992). Revegetation of native or desirable vegetation communities would occur in areas where disturbance is temporary, such as with construction of temporary work areas (site-specific reclamation requirements will be provided in a Reclamation, Revegetation, and Monitoring Framework Plan to be included in the POD). However, rehabilitation of native or desirable vegetation communities to a predisturbance state is unlikely in the short term and is not assured in the long term. Recovery of native or desirable vegetation communities following disturbance, especially those in arid ecosystems, may take decades, centuries, or longer (Coffin et al. 1996; Foster et al. 2003; Morris et al.

2011). Additionally, alterations to soil structure and chemistry, nutrient dynamics, hydrology, and plant species composition following disturbance often cause ecosystems to cross thresholds into alternate stable states not likely to resemble historic or preferred conditions (Hobbs et al. 2009).

Long-term removal of native or desirable vegetation would occur with construction of any new permanent Project features such as roads or transmission line towers. Additionally, vegetation in the right-of-way would be managed using the wire-zone border-zone method (Appendix B), which would include clearing of tall vegetation to allow for safe operation of the transmission line. Areas cleared of tall growing vegetation would be revegetated with native or desirable species, many of which would already be components of the understory. However, the structure of these communities would be permanently altered and habitat values and/or ecosystem services of these communities may be affected.

Potential loss of the market value of timber resources due to vegetative clearing would be minimal in the short term, as the Applicant would be required to reimburse the BLM and USFS for the market value of timber cleared for the Project. However, clearing would result in a long-term direct loss of the market value of forest commodity materials as timber resources would not be allowed to re-establish in areas permanently cleared or maintained free of tall growing vegetation for safe operation of the transmission line.

Indirect Effects

Project-related construction activities and resulting increased vehicle use on new and improved access roads in the Project area, both by construction machinery and private vehicles, is likely to alter the ecological conditions in the Project area in the short and long term. Seeds may be transported by being lodged directly in vehicles, transported in mud attached to vehicles, and in hay or seed mixes used to reclaim disturbed areas. Clearing and transport of trees infested by bark beetles may inadvertently cause the spread of this species. Indirect impacts of the Project on vegetation communities also could include a potential decrease in population connectivity through reduced gene flow and pollinator movement.

In the long term, increased presence of highly flammable annual invasive species such as cheatgrass, in conjunction with ignition risk from increased vehicle use, could increase wildfire frequencies (Whisenant 1990a) and sizes (Balch et al. 2012). Frequent fires further increase the susceptibility of an area to invasion by and continued dominance of cheatgrass, creating a positive feedback loop.

Mitigation Planning and Effectiveness

Design features of the Proposed Action for environmental protection have been incorporated by the Applicant into the Project description and would be applied to the entire Project. Design Features 1, 2, 5, 9, 14, 17, 26, 27, 30, and 33 are applicable to vegetation resources and are described in this section.

- **Design Feature 1 (minimization clearing)**. Vegetation would be left in place wherever possible where recontouring is not required. This would minimize disturbance to vegetation communities from Project activities.
- **Design Feature 2 (surface recontouring and reclamation)**. Areas subject to ground disturbance would be recontoured and reclaimed as required by the landowner or land-management agency. This would generally include reclamation of disturbed areas by establishing stable contours, spreading stockpiled topsoil, and revegetation using a seed mix appropriate for the environmental conditions in which the disturbance has occurred (approved by the BLM or USFS, as appropriate, or as negotiated by individual landowners). A Reclamation, Revegetation, and Monitoring Framework Plan that includes site-specific methods (e.g., topsoil stripping and storage, timing of reclamation activities, seed mixes, monitoring methods, standards for reclamation success, bond

release criteria, etc.) would be included in the POD. This design feature would minimize the temporal scope of disturbance, decrease the likelihood that a disturbance area would be colonized by invasive species, and provide the best opportunity for disturbed areas to provide other beneficial ecological or socioeconomic services (e.g., wildlife habitat, livestock forage).

- **Design Feature 5 (creation of a noxious weed management plan)**. A Noxious Weed Management Plan would be developed and approved by the BLM, USFS, and county weed management officer and incorporated into the POD. This plan would be based on the principles and procedures outlined in the BLM Integrated Weed Management Manual 9015 and Forest Service Noxious Weed Management Manual 2080. This plan would include prescriptions for specific measures to treat, avoid, and reduce the spread of noxious weeds in the Project area during construction. A Reclamation, Revegetation, and Monitoring Framework Plan will also be developed to support the POD, which will specify protocols, timelines, and objectives for monitoring of noxious weed populations, if needed. Implementation of this design feature would minimize spread of noxious weed species in the Project area and the associated negative ecological effects of invasive species such as increased wildfire risk (Balch et al. 2012) and the competitive exclusion of native and desirable plant species.
- **Design Feature 9 (avoidance of special status plants and habitat)**. Special status plants and habitat identified during preconstruction surveys would be identified in the POD and flagged and spanned by Project structures, where feasible and within the limits of standard structure design. Where avoidance is not feasible, special status plants and their habitats would be treated in accordance with applicable law, regulation and agency policy. This design feature also would apply to riparian, water, wetland, and other rare or slow-regenerating vegetation types. Application of this design feature would allow sensitive vegetation to remain undisturbed whenever possible.
- **Design Feature 14 (creation of a Fire Protection Plan).** A Fire Protection Plan would be developed and incorporated into the POD, which would be approved by the BLM and USFS prior to the issuance of a right-of-way grant or special-use authorization, respectively. This design feature would minimize disturbance to vegetation communities from fire.
- **Design Feature 17 (topsoil salvaging).** In disturbed temporary work areas, the topsoil would be salvaged/segregated and distributed and contoured evenly over the surface of the disturbed area after construction completion. The soil surface would be seeded and left rough to help reduce potential for weeds and wind erosion. This design feature would minimize the risk of weed invasion in disturbed temporary work areas that could spread into adjacent vegetation communities.
- **Design Feature 26 (vehicle access restriction)**. All construction vehicle movement would be restricted to predesignated access roads. This design feature would minimize disturbance to vegetation communities from excess overland travel and the associated potential spread of noxious weeds and increase in risk of wildfire.
- **Design Feature 27 (construction activity access restriction)**. All Project-related construction activities would be limited to within a predetermined spatial extent. This design feature would minimize disturbance to vegetation communities from construction activities and the associated potential increased spread of noxious weeds and wildfire risk.
- **Design Feature 30 (hazardous materials restrictions)**. Hazardous materials would be contained and removed to a disposal facility, and not drained into the ground, streams, or drainages. This design feature would avoid degradation and loss of vegetation communities due to introduction of contaminants into the environment.

- **Design Feature 33 (disturbance buffers for activities near riparian areas).** Refueling and storing potentially hazardous materials would not occur within a 100-foot radius of a water body, a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water wells. Spill preventive and containment measures or practices would be incorporated as needed. Ground-disturbing activities within 328 feet (100 meters) of a riparian area would be required to meet exception criteria defined by BLM, and mitigation measures would be developed on a site-specific basis in consultation with the affected federal land-management agency and incorporated into the POD. If any disturbance were anticipated within 20 feet of the edge of a riparian area or other wetland habitat, a silt fence or certified weed-free wattle would be installed along the travel route on the wetland side unless the wetland is up-gradient. This design feature would minimize impacts on riparian areas.

Selective Mitigation Measures 1, 2, 4, and 7 would be implemented to reduce potential high or moderate impacts on riparian and wetland vegetation communities. Selective Mitigation Measures 11 and 13 could be implemented to reduce impacts on vegetation under special circumstances as identified during preconstruction surveys, though specific areas to which these measures would be applied have not been identified. These selective mitigation measures are described and discussed in this section.

- **Selective Mitigation Measure 1 (minimization of disturbance to sensitive soils and vegetation)**. In areas where soils or vegetation are particularly sensitive to disturbance (e.g., soils that are highly or moderately susceptible to water or wind erosion), existing trails and roads would not be widened or otherwise upgraded unless it is needed for travel safety as determined by the land-management agency. This mitigation measure would minimize stream sedimentation and habitat loss and degradation in sensitive riparian and wetland vegetation communities by reducing the amount of ground disturbance that would occur in these areas.
- **Selective Mitigation Measure 2 (avoidance of sensitive resources)**. No blading of new access roads would occur in certain resource areas (e.g., perennial streams, riparian areas, and wetlands). Existing roads would be used in these areas. This mitigation measure would minimize stream sedimentation and habitat loss and degradation in riparian and wetland vegetation communities by avoiding disturbance in these sensitive areas.
- **Selective Mitigation Measure 4 (minimization of tree clearing)**. Tree clearing in and adjacent to the right-of-way would be minimized to the extent practicable to satisfy conductor-clearance requirements. Trees and other vegetation would be removed selectively to blend the edge of the right-of-way into adjacent vegetation patterns (i.e., edge feathering) as practicable and appropriate. In riparian vegetation communities, only trees greater than 12 feet tall would be removed. This mitigation measure would limit disturbance riparian vegetation communities by reducing the number of trees cleared in Project corridors.
- **Selective Mitigation Measure 7 (spanning or avoiding of sensitive features)**. Project structures would be located to allow conductors to span or avoid identified sensitive features such as wetlands, riparian areas, and water courses. This mitigation measure would minimize stream sedimentation and habitat degradation in sensitive riparian and wetland vegetation communities. Avoiding or spanning these resources also would lower the risk of introduction of weeds and invasive species, reduce overall habitat fragmentation in the Project area, and minimize tree clearing in sensitive riparian areas.
- **Selective Mitigation Measure 11 (minimization of right-of-way clearing).** Clearing of the right-of-way would be minimized to reduce visual contrast and avoid sensitive features including, but not limited to, land uses, biological resources, and cultural sites. In select areas, the right-of-way width may be modified (within the limits of PacifiCorp Vegetation Management Standards and standard tower design) to protect sensitive resources, but current land uses would be allowed

to continue unabated, provided the use meets applicable standards. This would minimize impacts on specific vegetation areas where the need is identified during creation of site-specific design.

- **Selective Mitigation Measure 13 (overland access).** The Construction Contractor would use overland access to the greatest extent possible in areas where no grading would be needed to access work areas (refer to Table 2-13 for greater detail). This mitigation measure would minimize the amount of permanent or temporary vegetation clearing for access roads.

Effects Analysis

Methods for Analysis to Support Interdisciplinary Comparison of Alternative Routes

Criteria for Assessing Level of Impacts

Criteria were developed in collaboration with the Agency Interdisciplinary Team to assess the level of a potential effect on vegetation resources associated with implementation of the Project and to compare the impacts between alternative routes (Table 3-51). Impact criteria were based on considerations of relative abundance of each vegetative community, regeneration time, nature and magnitude of anticipated impacts, and additional protections for vegetation (including laws and statutes).

TABLE 3-51
CRITERIA FOR ASSESSING LEVEL OF DIRECT IMPACTS ON VEGETATION RESOURCES

Level of Impacts	Description
High	▪ Loss or adverse modification of very rare native vegetation communities ▪ Loss or adverse modification of vegetation communities crucial for ecosystem function and biodiversity
Moderate-high	▪ Loss or adverse modification of rare, uncommon native vegetation communities or common vegetation communities with a canopy greater than 5 feet ▪ Disturbance to very rare vegetation communities ▪ Disturbance of vegetation communities that regenerate very slowly following reclamation
Moderate	▪ Loss or adverse modification of uncommon native vegetation communities ▪ Disturbance to rare native vegetation communities ▪ Disturbance of vegetation communities that regenerate slowly following reclamation
Low-moderate	▪ Loss or adverse modification of somewhat uncommon native vegetation communities ▪ Disturbance to common native vegetation communities ▪ Disturbance of vegetation communities that regenerate somewhat rapidly following reclamation
Low	▪ Loss or adverse modification of common native vegetation communities ▪ Loss or adverse modification of vegetation communities that are not a component of the natural landscape ▪ Disturbance of vegetation communities that regenerate rapidly following reclamation

Initial Impacts

The level of potential effects on vegetation resources (i.e., specific cover types) that could result from implementation of the Project is used as the basis for assessing initial impacts. Design features of the Proposed Action would reduce impacts on vegetation resources and were considered when assessing potential impacts on specific resources. Based on the level of a potential effect on a vegetation resource, initial impacts were assigned (Table 3-52) using the criteria presented in Table 3-51.

TABLE 3-52 SUMMARY OF INITIAL AND RESIDUAL IMPACTS BY VEGETATION COMMUNITY				
Vegetation Community	**Design Feature**	**Initial Impacts**	**Location-specific Selective Mitigation Measures**	**Residual Impact**
Agriculture	1, 2, 5, 14, 17, 26, 27, 30, 33	Low	–	Low
Alpine	1, 2, 5, 9, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Aspen	1, 2, 5, 9, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Barren (less than 10 percent cover)	1, 2, 5, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Big sagebrush	1, 2, 5, 14, 17, 26, 27, 30, 33	Low-moderate	–	Low-moderate
Developed/disturbed	1, 2, 5, 14, 17, 26, 27, 30, 33	Low	–	Low
Grassland	1, 2, 5, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Invasive	1, 2, 5, 14, 17, 26, 27, 30, 33	Low	–	Low
Montane forest	1, 2, 5, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Mountain shrub	1, 2, 5, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Pinyon-juniper	1, 2, 5, 14, 17, 26, 27, 30, 33	Low-moderate	–	Low-moderate
Ponderosa pine	1, 2, 5, 14, 17, 26, 27, 30, 33	Moderate	–	Moderate
Riparian	1, 2, 5, 14, 17, 9, 26, 27, 30, 33	High	1, 2, 4, 7	Moderate-high
Shrub/shrub steppe	1, 2, 5, 14, 17, 26, 27, 30, 33	Low-moderate	–	Low-moderate
Water	1, 2, 5, 9, 14, 17, 26, 27, 30, 33	High	1, 2, 4, 7	Moderate
Wetland	1, 2, 5, 9, 14, 17, 26, 27, 30, 33	High	1, 2, 4, 7	Moderate

A low initial impact was assigned to the agriculture, developed/disturbed, and invasive vegetation communities because only minimal impacts on the existing condition of these vegetation communities would be expected from short- or long-term Project-related activities. Vegetation would be removed and damaged in previously disturbed areas. Vegetation in these communities regenerates rapidly and has been introduced through previous human activities.

A low-moderate initial impact was assigned to the big sagebrush, pinyon-juniper, and the shrub/shrub steppe vegetation communities, and a moderate initial impact was assigned to the alpine, aspen, barren, grassland, montane forest, mountain shrub, and ponderosa pine vegetation communities. Large trees in some of these vegetation communities would be permanently cleared as required to meet the Project's safety standards, further impacting the ability of these areas to function as wildlife habitat.

A high initial impact was assigned to the riparian, water, and wetland vegetation communities. Riparian and wetland vegetation communities are among the most rare vegetation communities in the arid west. Without mitigation, riparian communities crossed by right-of-way corridors could be permanently altered (i.e., cleared of vegetation with the potential to reach heights greater than 5 feet in the wire zone and 25 feet in the border zone) to meet the Project's operational safety standards (Appendix B).

Residual Impacts

Selective mitigation measures are applied to reduce the level of impacts associated with Project construction and maintenance. Residual impacts are anticipated impacts on vegetation resources after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness section. The level of potential residual impacts on vegetation resources associated with implementation of the Project was assessed using the criteria presented in Table 3-51. A summary of anticipated initial and residual impacts on vegetation resources, as well as the selective mitigation measures applied, are presented in Table 3-52.

Application of selective mitigation measures is expected to reduce the level of anticipated impacts on the water and wetland vegetation communities from high to moderate and on the riparian vegetation community from high to moderate-high. Impacts on specific vegetation communities resulting from Project activities are discussed in this section.

Agriculture

Loss of this vegetation community could have negative economic impacts, as areas permanently converted from agriculture use to transmission line structures would no longer be available for the production of crops or livestock.

Alpine, Big Sagebrush, Grassland, and Shrub/Shrub Steppe

Loss of these vegetation communities would be detrimental to wildlife and special status plant species that inhabit them, many of which have highly restricted ranges (Appendix E) The loss of vegetation in these communities also would negatively impact their ability to function for other desirable uses, such as forage and rangeland for livestock.

Aspen, Montane Forest, Mountain Shrub, Pinyon-Juniper, and Ponderosa Pine

In addition to permanent losses of these vegetation communities due to access road and transmission line facility construction, tall vegetation in these vegetation communities would be cleared in the right-of-way if it interferes with safe operation of the transmission line. Though these areas would be revegetated with ecologically appropriate species, many of which are already understory component species, the structure of these communities would be permanently altered. Subsequently, these communities may not provide equivalent habitat or ecosystem services. Permanent alterations of these vegetation communities could be detrimental to wildlife and special status plant species that inhabit wooded areas (Appendix E). The loss of vegetation in these communities also would affect their ability to function for other desirable uses, such as forage and rangeland for livestock.

Barren/Sparsely Vegetated

Reduction in acreages of this vegetation community, which may be particularly sensitive to disturbance due to its unique soil conditions (e.g., extreme salinity or alkalinity, high composition of sand or rocks), would be detrimental to associated wildlife and special status plant species (Appendix E). The loss of vegetation in these communities also would affect their ability to function for other desirable uses, such as forage and rangeland for livestock.

Developed/Disturbed and Invasive

Loss of these vegetation communities would not be expected to result in adverse impacts on other resources as it is assumed that site reclamation and revegetation with native or desirable species would occur as soon as is practicable for areas not permanently converted to roads, transmission line tower pads, or other Project facilities (Design Feature 2).

Riparian

If avoidance is not possible under Selective Mitigation Measures 1, 2, 4, and 7, tall vegetation in this community that interferes with safe operation of the transmission line would be cleared in the wire zone of the right-of-way. Cleared acreages subsequently would be converted permanently to another vegetation community, which may not provide equivalent habitat or ecosystem services. Loss of riparian vegetation would be detrimental to wildlife and special status plant species that depend on these areas (Appendix E) and to the ability of these areas to provide ecological and socioeconomic services. In addition, disturbance

such as from construction of new road crossings in riparian areas could increase soil loss and subsequently decrease downstream water quality.

Water and Wetland

If avoidance of these vegetation communities is not possible under Selective Mitigation Measures 1, 2, 4, and 7, acreage losses and disturbances in water and wetland vegetation communities would be detrimental to wildlife and special status plant species that depend on these areas (Appendix E). Disturbance in water and wetland areas also could adversely affect water quality and the ability of these vegetation communities to provide ecosystem services such as water filtration and groundwater recharge.

Methods for Additional Analysis of Potential Impacts

In addition to the analysis conducted to allow interdisciplinary comparison of alternative routes, additional analyses were required to adequately address some issues raised by the public and the agencies during scoping regarding potential impacts on vegetation resources or to meet the requirements of relevant law, regulation, or policy.

The total loss of vegetative cover (in acres) due to Project Features was estimated to provide an overview of the extent of potential impacts on vegetative resources. The analysis was completed by estimating the total disturbance due to construction of features such as roads, transmission line towers, and other Project facilities over the entire length of an alternative and divided by the total length of an alternative to calculate the average rate of disturbance per mile. This rate was then used to estimate the extent of loss of vegetative cover (in acres) that would occur with each specific length of vegetation community crossed by an alternative route.

As the amount of vegetation disturbance per mile varies by alternative and by route variation, the same length of vegetation community crossed by different alternative routes or route variations could have fluctuations in disturbance per vegetation community.

The estimated area (in acres) of vegetation clearing (i.e., removal of tall vegetation and the subsequent conversion of forested vegetation communities to other community types) was calculated by multiplying lengths of crossings of vegetation communities assumed to have tall vegetation (aspen, montane forest, mountain shrub, pinyon-juniper, and riparian) by the width of the right-of-way (250 feet). Though only vegetation with the potential to reach heights greater than 5 feet in the wire zone and 25 feet in the border zone, would be cleared during the construction, operation, and maintenance of the Project. The edges of these areas would be feathered to blend with surrounding landscape patterns (Selective Mitigation Measure 4). It is assumed for the purposes of analysis that all vegetation within the 250-foot right-of-way would be cleared in these communities.

3.2.5.5 Results

Disturbance of vegetation communities would occur with implementation of any of the action alternative routes considered. Loss of vegetation would occur through direct removal of vegetation, result from conversion to access roads or transmission line structures, and by vegetative conversion (i.e., clearing of taller vegetation in the transmission line right-of-way). The application of selective mitigation measures would reduce the level of impacts in some of these vegetation communities (Section 3.2.5.4 and Table 3-52). The types of potential effects on vegetation communities that could occur under all alternative routes and the degree to which these effects would be mitigated or avoided are described in Section 3.2.5.4.

3.2.5.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.5.5.2 Impacts Common to All Action Alternatives

There are no impacts common to all action alternative routes for vegetation resources.

3.2.5.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary transmission line components would be located in an area between Mona and Clover substations west of the town of Mona. Most of the 345kV ancillary transmission line components would be within an existing right-of-way. Vegetation communities crossed by these components are predominantly agriculture and big sagebrush, with lesser extents of pinyon-juniper, invasive, and shrub/shrub steppe.

3.2.5.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Environmental Setting

The WYCO route grouping is from Aeolus, Wyoming to U.S. Highway 40 in Colorado (Map 2-2a). The majority of this route grouping is in the Wyoming Basin Ecoregion but crosses into the Colorado Plateaus Ecoregion as it proceeds southwest of the area around Maybell, Colorado.

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B in Wyoming is located entirely in the Wyoming Basin Ecoregion and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities are also crossed by this alternative route (Table 3-53).

TABLE 3-53
ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES INVENTORY DATA FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Vegetation Community (miles crossed)														
		Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative WYCO-B and Route Variations																
WYCO-B (Applicant Preferred Alternative)	204.5	1.4	0.0	0.0	4.6	109.0	1.8	2.5	0.9	0.0	0.0	8.5	71.6	2.1	0.2	1.9
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*3.3*	*74.2*	*0.6*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*54.5*	*2.1*	*0.1*	*1.9*
Colorado	*66.4*	*1.4*	*0.0*	*0.0*	*1.3*	*34.8*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-B-1	204.9	1.4	0.0	0.0	4.8	110.1	1.8	2.5	0.9	0.0	0.0	8.5	70.7	2.1	0.2	1.9
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*3.3*	*74.2*	*0.6*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*54.5*	*2.1*	*0.1*	*1.9*
Colorado	*66.8*	*1.4*	*0.0*	*0.0*	*1.5*	*35.9*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*16.2*	*0.0*	*0.1*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	1.1	0.0	0.0	4.6	110.1	1.9	1.8	0.9	0.0	0.0	8.3	71.6	2.1	0.2	1.9
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*3.3*	*74.2*	*0.6*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*54.5*	*2.1*	*0.1*	*1.9*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.9*	*1.3*	*0.8*	*0.9*	*0.0*	*0.0*	*7.9*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-B-3	204.5	1.1	0.0	0.0	4.6	109.8	2.0	2.1	0.9	0.0	0.0	8.1	71.7	2.1	0.2	1.9
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*3.3*	*74.2*	*0.6*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*54.5*	*2.1*	*0.1*	*1.9*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.6*	*1.4*	*1.1*	*0.9*	*0.0*	*0.0*	*7.7*	*17.2*	*0.0*	*0.1*	*0.0*
Alternative WYCO-C and Route Variations																
WYCO-C	210.4	1.4	0.0	0.0	2.4	108.0	1.7	2.5	0.9	0.0	0.0	8.4	80.6	1.6	0.2	2.7
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.1*	*73.2*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*63.5*	*1.6*	*0.1*	*2.7*
Colorado	*66.4*	*1.4*	*0.0*	*0.0*	*1.3*	*34.8*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-C-1	210.8	1.4	0.0	0.0	2.6	109.1	1.7	2.5	0.9	0.0	0.0	8.4	79.7	1.6	0.2	2.7
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.1*	*73.2*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*63.5*	*1.6*	*0.1*	*2.7*
Colorado	*66.8*	*1.4*	*0.0*	*0.0*	*1.5*	*35.9*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*16.2*	*0.0*	*0.1*	*0.0*
WYCO-C-2	210.4	1.1	0.0	0.0	2.4	109.1	1.8	1.8	0.9	0.0	0.0	8.2	80.6	1.6	0.2	2.7
Wyoming	*144*	*0.0*	*0.0*	*0.0*	*1.1*	*73.2*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*63.5*	*1.6*	*0.1*	*2.7*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.9*	*1.3*	*0.8*	*0.9*	*0.0*	*0.0*	*7.9*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-C-3	210.4	1.1	0.0	0.0	2.4	108.8	1.9	2.1	0.9	0.0	0.0	8.0	80.7	1.6	0.2	2.7
Wyoming	*144*	*0.0*	*0.0*	*0.0*	*1.1*	*73.2*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*63.5*	*1.6*	*0.1*	*2.7*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.6*	*1.4*	*1.1*	*0.9*	*0.0*	*0.0*	*7.7*	*17.2*	*0.0*	*0.1*	*0.0*
Alternative WYCO-D and Route Variation																
WYCO-D	250.0	18.4	0.0	0.0	0.3	166.2	2.9	7.9	1.0	0.0	0.2	5.9	41.6	3.3	0.3	2.0
Wyoming	*135.0*	*0.0*	*0.0*	*0.0*	*0.3*	*93.9*	*1.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*33.5*	*2.3*	*0.1*	*2.0*
Colorado	*115.0*	*18.4*	*0.0*	*0.0*	*0.0*	*72.3*	*1.4*	*6.9*	*1.0*	*0.0*	*0.2*	*5.5*	*8.1*	*1.0*	*0.2*	*0.0*
WYCO-D-1	250.0	18.1	0.0	0.0	0.3	167.0	3.1	7.5	1.0	0.0	0.2	5.5	41.7	3.3	0.3	2.0
Wyoming	*135.0*	*0.0*	*0.0*	*0.0*	*0.3*	*93.9*	*1.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.4*	*33.5*	*2.3*	*0.1*	*2.0*
Colorado	*115.0*	*18.1*	*0.0*	*0.0*	*0.0*	*73.1*	*1.6*	*6.5*	*1.0*	*0.0*	*0.2*	*5.1*	*8.2*	*1.0*	*0.2*	*0.0*

TABLE 3-53
ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES INVENTORY DATA FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Vegetation Community (miles crossed)														
		Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative WYCO-F and Route Variations																
WYCO-F	218.9	1.4	0.0	0.0	1.9	129.4	1.7	2.5	0.9	0.0	0.0	8.4	68.6	2.0	0.2	1.9
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*0.6*	*94.6*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*51.5*	*2.0*	*0.1*	*1.9*
Colorado	*66.4*	*1.4*	*0.0*	*0.0*	*1.3*	*34.8*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-F-1	219.3	1.4	0.0	0.0	2.1	130.5	1.7	2.5	0.9	0.0	0.0	8.4	67.7	2.0	0.2	1.9
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*0.6*	*94.6*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*51.5*	*2.0*	*0.1*	*1.9*
Colorado	*66.8*	*1.4*	*0.0*	*0.0*	*1.5*	*35.9*	*1.2*	*1.5*	*0.9*	*0.0*	*0.0*	*8.1*	*16.2*	*0.0*	*0.1*	*0.0*
WYCO-F-2	218.9	1.1	0.0	0.0	1.9	130.5	1.8	1.8	0.9	0.0	0.0	8.2	68.6	2.0	0.2	1.9
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*0.6*	*94.6*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*51.5*	*2.0*	*0.1*	*1.9*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.9*	*1.3*	*0.8*	*0.9*	*0.0*	*0.0*	*7.9*	*17.1*	*0.0*	*0.1*	*0.0*
WYCO-F-3	218.9	1.1	0.0	0.0	1.9	130.2	1.9	2.1	0.9	0.0	0.0	8.0	68.7	2.0	0.2	1.9
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*0.6*	*94.6*	*0.5*	*1.0*	*0.0*	*0.0*	*0.0*	*0.3*	*51.5*	*2.0*	*0.1*	*1.9*
Colorado	*66.4*	*1.1*	*0.0*	*0.0*	*1.3*	*35.6*	*1.4*	*1.1*	*0.9*	*0.0*	*0.0*	*7.7*	*17.2*	*0.0*	*0.1*	*0.0*

Environmental Consequences (Wyoming)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-B in Wyoming after application of selective mitigation measures is shown in Table 3-54. The numbers in this table represent the miles of vegetation communities in each residual impact category crossed by the centerline of each alternative route.

TABLE 3-54
ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts (miles crossed)			
		Low	Low-Moderate	Moderate	Moderate-High
Alternative WYCO-B and Route Variations					
WYCO-B (Applicant Preferred Alternative)	204.5	4.1	189.1	9.2	2.1
Wyoming	*138.1*	*0.6*	*129.1*	*6.3*	*2.1*
Colorado	*66.4*	*3.5*	*60.0*	*2.9*	*0.0*
WYCO-B-1	204.9	4.1	189.3	9.4	2.1
Wyoming	*138.1*	*0.6*	*129.1*	*6.3*	*2.1*
Colorado	*66.8*	*3.5*	*60.2*	*3.1*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	3.9	190.0	8.5	2.1
Wyoming	*138.1*	*0.6*	*129.1*	*6.3*	*2.1*
Colorado	*66.4*	*3.3*	*60.9*	*2.2*	*0.0*
WYCO-B-3	204.5	4.0	189.6	8.8	2.1
Wyoming	*138.1*	*0.6*	*129.1*	*6.3*	*2.1*
Colorado	*66.4*	*3.4*	*60.5*	*2.5*	*0.0*
Alternative WYCO-C and Route Variations					
WYCO-C	210.4	4.0	197.0	7.8	1.6
Wyoming	*144.0*	*0.5*	*137.0*	*4.9*	*1.6*
Colorado	*66.4*	*3.5*	*60.0*	*2.9*	*0.0*
WYCO-C-1	210.8	4.0	197.2	8.0	1.6
Wyoming	*144.0*	*0.5*	*137.0*	*4.9*	*1.6*
Colorado	*66.8*	*3.5*	*60.2*	*3.1*	*0.0*
WYCO-C-2	210.4	3.8	197.9	7.1	1.6
Wyoming	*144.0*	*0.5*	*137.0*	*4.9*	*1.6*
Colorado	*66.4*	*3.3*	*60.9*	*2.2*	*0.0*
WYCO-C-3	210.4	3.9	197.5	7.4	1.6
Wyoming	*144.0*	*0.5*	*137.0*	*4.9*	*1.6*
Colorado	*66.4*	*3.4*	*60.5*	*2.5*	*0.0*
Alternative WYCO-D and Route Variation					
WYCO-D	250.0	22.3	213.7	10.7	3.3
Wyoming	*135.0*	*1.5*	*127.8*	*3.4*	*2.3*
Colorado	*115.0*	*20.8*	*85.9*	*7.3*	*1.0*
WYCO-D-1	250.0	22.2	214.2	10.3	3.3
Wyoming	*135.0*	*1.5*	*127.8*	*3.4*	*2.3*
Colorado	*115.0*	*20.7*	*86.4*	*6.9*	*1.0*
Alternative WYCO-F and Route Variations					
WYCO-F	218.9	4.0	206.4	6.5	2.0
Wyoming	*152.5*	*0.5*	*146.4*	*3.6*	*2.0*
Colorado	*66.4*	*3.5*	*60.0*	*2.9*	*0.0*
WYCO-F-1	219.3	4.0	206.6	6.7	2.0
Wyoming	*152.5*	*0.5*	*146.4*	*3.6*	*2.0*
Colorado	*66.8*	*3.5*	*60.2*	*3.1*	*0.0*
WYCO-F-2	218.9	3.8	207.3	5.8	2.0
Wyoming	*152.5*	*0.5*	*146.4*	*3.6*	*2.0*
Colorado	*66.4*	*3.3*	*60.9*	*2.2*	*0.0*

TABLE 3-54 ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES					
Alternative Route	**Total Miles**	**Residual Impacts (miles crossed)**			
		Low	**Low-Moderate**	**Moderate**	**Moderate-High**
WYCO-F-3	218.9	3.9	206.9	6.1	2.0
Wyoming	*152.5*	*0.5*	*146.4*	*3.6*	*2.0*
Colorado	*66.4*	*3.4*	*60.5*	*2.5*	*0.0*

Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller areas of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, grassland, and wetland vegetation communities Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities (Tables 3-53 and 3-54).

Results of Additional Analysis of Potential Impacts

Alternative WYCO-B in Wyoming would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in the big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities (Table 3-55).

TABLE 3-55 LONG-TERM SURFACE DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES															
Alternative Route	**Vegetation Community Disturbed (acres)**														
	Agriculture	**Alpine**	**Aspen**	**Barren/Sparsely Vegetated**	**Big Sagebrush**	**Developed/Disturbed**	**Grassland**	**Invasive**	**Montane Forest**	**Mountain Shrub**	**Pinyon-Juniper**	**Shrub/Shrub Steppe**	**Riparian**	**Water**	**Wetland**
Alternative WYCO-B and Route Variations															
WYCO-B (Applicant Preferred Alternative)	23	0	0	75	1,779	29	41	15	0	0	139	1,168	34	3	31
Wyoming	*0*	*0*	*0*	*54*	*1,211*	10	*16*	*0*	*0*	*0*	*7*	*889*	*34*	*2*	*31*
Colorado	*23*	*0*	*0*	*21*	*568*	*20*	*25*	*15*	*0*	*0*	*132*	*279*	*0*	*2*	*0*
WYCO-B-1	23	0	0	78	1,789	29	41	15	0	0	138	1,149	34	3	31
Wyoming	*0*	*0*	*0*	*54*	*1,206*	*10*	*16*	*0*	*0*	*0*	*7*	*885*	*34*	*2*	*31*
Colorado	*23*	*0*	*0*	*24*	*583*	*20*	*24*	*15*	*0*	*0*	*132*	*263*	*0*	*2*	0
WYCO-B-2 (Agency Preferred Alternative)	18	0	0	75	1,790	31	29	15	0	0	135	1,164	34	3	31
Wyoming	*0*	*0*	*0*	*54*	*1,207*	*10*	*16*	*0*	*0*	*0*	*7*	*886*	*34*	*2*	*31*
Colorado	*18*	*0*	*0*	*21*	*584*	*21*	*13*	*15*	*0*	*0*	*129*	*278*	*0*	*2*	*0*
WYCO-B-3	18	0	0	75	1,790	33	34	15	0	0	132	1,169	34	3	31
Wyoming	*0*	*0*	*0*	*54*	*1,210*	*10*	*16*	*0*	*0*	*0*	*7*	*889*	*34*	*2*	*31*
Colorado	*18*	*0*	*0*	*21*	*580*	*23*	*18*	*15*	*0*	*0*	*126*	*280*	*0*	*2*	*0*

TABLE 3-55
LONG-TERM SURFACE DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Vegetation Community Disturbed (acres)														
	Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative WYCO-C and Route Variations															
WYCO-C	23	0	0	39	1,750	28	41	15	0	0	136	1,306	26	3	44
Wyoming	*0*	*0*	*0*	*18*	*1,186*	*8*	*16*	*0*	*0*	*0*	*5*	*1029*	*26*	*2*	*44*
Colorado	*23*	*0*	*0*	*21*	*564*	*19*	*24*	*15*	*0*	*0*	*131*	*277*	*0*	*2*	*0*
WYCO-C-1	23	0	0	42	1,760	27	40	15	0	0	136	1,286	26	3	44
Wyoming	*0*	*0*	*0*	*18*	*1,181*	*8*	*16*	*0*	*0*	*0*	*5*	*1,025*	*26*	*2*	*44*
Colorado	*23*	*0*	*0*	*24*	*579*	*19*	*24*	*15*	*0*	*0*	*131*	*261*	*0*	*2*	*0*
WYCO-C-2	18	0	0	39	1,762	29	29	15	0	0	132	1,302	26	3	44
Wyoming	*0*	*0*	*0*	*18*	*1,182*	*8*	*16*	*0*	*0*	*0*	*5*	*1,026*	*26*	*2*	*44*
Colorado	*18*	*0*	*0*	*21*	*580*	*21*	*13*	*15*	*0*	*0*	*128*	*276*	*0*	*2*	*0*
WYCO-C-3	18	0	0	39	1,762	31	34	15	0	0	130	1,307	26	3	44
Wyoming	*0*	*0*	*0*	*18*	*1,185*	*8*	*16*	*0*	*0*	*0*	*5*	*1,028*	*26*	*2*	*44*
Colorado	*18*	*0*	*0*	*21*	*576*	*23*	*18*	*15*	*0*	*0*	*125*	*279*	*0*	*2*	*0*
Alternative WYCO-D and Route Variation															
WYCO-D	294	0	0	5	2,655	46	126	16	0	3	94	665	53	5	32
Wyoming	*0*	*0*	*0*	*5*	*1,500*	*24*	*16*	*0*	*0*	*0*	*6*	*535*	*37*	*2*	*32*
Colorado	*294*	*0*	*0*	*0*	*1,155*	*22*	*110*	*16*	*0*	*3*	*88*	*129*	*16*	*3*	*0*
WYCO-D-1	290	0	0	5	2,673	50	120	16	0	3	88	668	53	5	32
Wyoming	*0*	*0*	*0*	*5*	*1,503*	*24*	*16*	*0*	*0*	*0*	*6*	*536*	*37*	*2*	*32*
Colorado	*290*	*0*	*0*	*0*	*1,170*	*26*	*104*	*16*	*0*	*3*	*82*	*131*	*16*	*3*	*0*
Alternative WYCO-F and Route Variations															
WYCO-F	23	0	0	31	2,088	27	40	15	0	0	136	1,107	32	3	31
Wyoming	*0*	*0*	*0*	*10*	*1,527*	*8*	*16*	*0*	*0*	*0*	*5*	*831*	*32*	*2*	*31*
Colorado	*23*	*0*	*0*	*21*	*562*	*19*	*24*	*15*	*0*	*0*	*131*	*276*	*0*	*2*	*0*
WYCO-F-1	23	0	0	34	2,097	27	40	15	0	0	135	1,088	32	3	31
Wyoming	*0*	*0*	*0*	*10*	*1,520*	*8*	*16*	*0*	*0*	*0*	*5*	*828*	*32*	*2*	*31*
Colorado	*23*	*0*	*0*	*24*	*577*	*19*	*24*	*15*	*0*	*0*	*130*	*260*	*0*	*2*	*0*
WYCO-F-2	18	0	0	31	2,099	29	29	15	0	0	132	1,103	32	3	31
Wyoming	*0*	*0*	*0*	*10*	*1,522*	*8*	*16*	*0*	*0*	*0*	*5*	*828*	*32*	*2*	*31*
Colorado	*18*	*0*	*0*	*21*	*577*	*21*	*13*	*15*	*0*	*0*	*127*	*275*	*0*	*2*	*0*
WYCO-F-3	18	0	0	31	2,100	31	34	15	0	0	129	1,108	32	3	31
Wyoming	*0*	*0*	*0*	*10*	*1,525*	*8*	*16*	*0*	*0*	*0*	*5*	*830*	*32*	*2*	*31*
Colorado	*18*	*0*	*0*	*21*	*574*	*23*	*18*	*15*	*0*	*0*	*124*	*277*	*0*	*2*	*0*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Vegetative clearing (the removal of vegetative biomass with the potential to reach heights greater than 5 feet in the wire zone and 25 feet in the border zone of the right-of-way; refer to Appendix B) would be required for Alternative WYCO-B in Wyoming. Vegetative clearing would occur in pinyon-juniper vegetation communities (Table 3-56).

TABLE 3-56
AREA OF VEGETATION CLEARING FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Vegetation Clearing (acres)	Vegetation Clearing (acres)				
		Aspen	Montane Forest	Mountain Shrub	Pinyon-Juniper	Riparian
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	321	0	0	0	258	64
Wyoming	*76*	*0*	*0*	*0*	*12*	*64*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-B-1	321	0	0	0	258	64
Wyoming	*76*	*0*	*0*	*0*	*12*	*64*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-B-2 (Agency Preferred Alternative)	315	0	0	0	252	64
Wyoming	*76*	*0*	*0*	*0*	*12*	*64*
Colorado	*239*	*0*	*0*	*0*	*239*	*0*
WYCO-B-3	309	0	0	0	246	64
Wyoming	*76*	*0*	*0*	*0*	*12*	*64*
Colorado	*233*	*0*	*0*	*0*	*233*	*0*
Alternative WYCO-C and Route Variations						
WYCO-C	303	0	0	0	255	49
Wyoming	*58*	*0*	*0*	*0*	*9*	*49*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-C-1	303	0	0	0	255	49
Wyoming	*58*	*0*	*0*	*0*	*9*	*49*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-C-2	297	0	0	0	249	49
Wyoming	*58*	*0*	*0*	*0*	*9*	*49*
Colorado	*239*	*0*	*0*	*0*	*239*	*0*
WYCO-C-3	291	0	0	0	242	49
Wyoming	*58*	*0*	*0*	*0*	*9*	*49*
Colorado	*233*	*0*	*0*	*0*	*233*	*0*
Alternative WYCO-D and Route Variation						
WYCO-D	285	0	0	6	179	100
Wyoming	*82*	*0*	*0*	*0*	*12*	*70*
Colorado	*203*	*0*	*0*	*6*	*167*	*30*
WYCO-D-1	273	0	0	6	167	100
Wyoming	*82*	*0*	*0*	*0*	*12*	*70*
Colorado	*191*	*0*	*0*	*6*	*155*	*30*
Alternative WYCO-F and Route Variations						
WYCO-F	315	0	0	0	255	61
Wyoming	*70*	*0*	*0*	*0*	*9*	*61*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-F-1	315	0	0	0	255	61
Wyoming	*70*	*0*	*0*	*0*	*9*	*61*
Colorado	*246*	*0*	*0*	*0*	*246*	*0*
WYCO-F-2	309	0	0	0	249	61
Wyoming	*70*	*0*	*0*	*0*	*9*	*61*
Colorado	*239*	*0*	*0*	*0*	*239*	*0*
WYCO-F-3	303	0	0	0	242	61
Wyoming	*70*	*0*	*0*	*0*	*9*	*61*
Colorado	*233*	*0*	*0*	*0*	*233*	*0*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Between Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, minor variations exist in the number of miles of vegetation communities crossed and the extent of impact in acres from proposed Project activities (refer to Tables 3-53, 3-55, and 3-56).

Affected Environment (Colorado)

Alternative WYCO-B in Colorado begins in the Wyoming Basin Ecoregion and enters the Colorado Plateaus Ecoregion as it approaches U.S. Highway 40 and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of agriculture, water, barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities are also crossed by this alternative route in Colorado (Table 3-53).

Environmental Consequences (Colorado)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-B in Colorado after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller amounts of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, and grassland vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative WYCO-B in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction (Table 3-55). These losses would occur predominantly in big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, water, barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities (Table 3-55).

Vegetation clearing would occur primarily in pinyon-juniper vegetation communities with lesser extents occurring in riparian vegetation communities (Table 3-56).

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Between Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3, minor variations exist in the number of miles of vegetation communities crossed and the extent of impact in acres from proposed Project activities (refer to refer to Tables 3-53, 3-55, and 3-56).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C in Wyoming is entirely in the Wyoming Basin Ecoregion and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53). Smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities are also crossed by this alternative route (Table 3-53).

Environmental Consequences (Wyoming)

Alternative WYCO-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-C in Wyoming after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller areas of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54; refer to Table 3-52 for residual impacts by vegetation communities). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, and wetland vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities (Tables 3-53 and 3-54).

Results of Additional Analysis of Potential Impacts

Alternative WYCO-C in Wyoming would result in permanent loss of vegetative cover due to access road and transmission line construction (Table 3-55). These losses would occur predominantly in the big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities (Table 3-55).

Vegetation clearing would occur in pinyon-juniper vegetation communities (Table 3-56).

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Between Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-53, 3-55, and 3-56).

Affected Environment (Colorado)

Alternative WYCO-C in Colorado is mostly in the Wyoming Basin Ecoregion but enters the Colorado Plateaus Ecoregion as it approaches U.S. Highway 40 and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of agriculture, water, barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities are also crossed by this alternative route in Colorado (Table 3-53).

Environmental Consequences (Colorado)

Alternative WYCO-C

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-C in Colorado after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller amounts of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, and grassland vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative WYCO-C in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, water,

barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities (Table 3-55).

Vegetation clearing would occur primarily in pinyon-juniper vegetation communities with lesser extents occurring in riparian vegetation communities (Table 3-56).

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Between Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3, minor variations exist in the number of miles of vegetation communities crossed and the extent of impact in acres from proposed Project activities (refer to refer to Tables 3-53, 3-55, and 3-56).

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D in Wyoming is entirely in the Wyoming Basin Ecoregion and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities also are crossed by this alternative route (Table 3-53).

Environmental Consequences (Wyoming)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-D in Wyoming after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller areas of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54; refer to Table 3-52 for residual impacts by vegetation communities). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, grassland, and wetland vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities (Tables 3-53 and 3-54).

Results of Additional Analysis of Potential Impacts

Alternative WYCO-D in Wyoming would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in the big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities (Table 3-55).

Vegetation clearing would occur in pinyon-juniper vegetation communities (Table 3-56).

Alternative WYCO-D Route Variation (WYCO-D-1)

Between Alternative WYCO-D and Route Variation WYCO-D-1, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-53, 3-55, and 3-56).

Affected Environment (Colorado)

Alternative WYCO-D in Colorado is mostly in the Wyoming Basin Ecoregion but enters the Colorado Plateaus Ecoregion as it approaches U.S. Highway 40. This alternative route predominantly crosses big sagebrush, but crosses more acres of agriculture than all other WYCO alternative routes in Colorado (Table 3-53).

Environmental Consequences (Colorado)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-D in Colorado after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the dominance of big sagebrush vegetation communities and lesser amounts of shrub/shrub steppe and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, grassland, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities (Tables 3-53 and 3-54).

Results of Additional Analysis of Potential Impacts

Alternative WYCO-D in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities (Table 3-55).

Vegetation clearing would occur primarily in pinyon-juniper vegetation communities and lesser extents would occur in riparian and mountain shrub vegetation communities (Table 3-56).

Alternative WYCO-D Route Variation (WYCO-D-1)

Between Alternative WYCO-D and Route Variation WYCO-D-1, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-53, 3-55, and 3-56).

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F in Wyoming is entirely in the Wyoming Basin Ecoregion and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities also are crossed by this alternative route (Table 3-53).

Environmental Consequences (Wyoming)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-F in Wyoming after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily

low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller areas of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, grassland, and wetland vegetation communities. Moderate-high impacts occur where this alternative route crosses riparian vegetation communities (Tables 3-53 and 3-54).

Results of Additional Analysis of Potential Impacts

Alternative WYCO-F in Wyoming would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in the big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, water, and wetland vegetation communities (Table 3-55).

Vegetation clearing would occur in pinyon-juniper vegetation communities (Table 3-56).

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Between Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3, minor variations exist in the number of miles of vegetation communities crossed and the extent of impact in acres from proposed Project activities (refer to refer to Tables 3-53, 3-55, and 3-56).

Affected Environment (Colorado)

Alternative WYCO-F in Colorado is mostly in the Wyoming Basin Ecoregion but enters the Colorado Plateaus Ecoregion as it approaches U.S. Highway 40 and predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities. Smaller areas of agriculture, water, barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities are also crossed by this alternative route in Colorado (Table 3-53).

Environmental Consequences (Colorado)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative WYCO-F in Colorado after application of selective mitigation measures is shown in Table 3-54. Impacts are primarily low-moderate due to the predominance of big sagebrush and shrub/shrub steppe vegetation communities and smaller amounts of pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-53 and 3-54). Moderate impacts would occur where this alternative route crosses water, barren/sparsely vegetated, and grassland vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative WYCO-F in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, water, barren/sparsely vegetated, developed/disturbed, grassland, invasive, and pinyon-juniper vegetation communities (Table 3-55).

Vegetation clearing would occur primarily in pinyon-juniper vegetation communities with lesser extents occurring in riparian vegetation communities (Table 3-56).

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Between Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-53, 3-55, and 3-56).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Environmental Setting

The COUT BAX route grouping is from U.S. Highway 40 in Colorado to Clover, Utah by way of Baxter Pass. This route grouping travels south of the Uintah and Ouray Indian Reservation and passes through Green River, Utah (Map 2-2b). This grouping is predominantly in the Colorado Plateaus Ecoregion but crosses into the Wasatch and Uinta Mountains and Central Basin and Range ecoregions as it approaches Mona, Utah.

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado is entirely in the Colorado Plateaus Ecoregion and predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-57). Smaller areas of alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, and water vegetation communities also are crossed by this alternative route.

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT BAX-B in Colorado after application of selective mitigation measures is shown in Table 3-58. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-57 and 3-58; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation.

TABLE 3-57
ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Vegetation Community (miles crossed)														
		Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
COUT BAX-B	279.2	6.8	0.5	8.2	19.5	46.9	3.4	6.5	4.5	7.5	12.5	42.5	118.8	1.3	0.2	0.1
Colorado	*86.7*	*0.0*	*0.1*	*1.1*	*1.7*	*32.6*	*0.6*	*0.7*	*2.1*	*0.2*	*5.0*	*22.0*	*20.4*	*0.1*	*0.1*	*0.0*
Utah	*192.5*	*6.8*	*0.4*	*7.1*	*17.8*	*14.3*	*2.8*	*5.8*	*2.4*	*7.3*	*7.5*	*20.5*	*98.4*	*1.2*	*0.1*	*0.1*
COUT BAX-C	289.7	6.8	0.5	8.2	19.3	49.1	3.4	6.7	4.3	7.5	12.5	44.2	125.2	1.8	0.2	0.0
Colorado	*86.7*	*0.0*	*0.1*	*1.1*	*1.7*	*32.6*	*0.6*	*0.7*	*2.1*	*0.2*	*5.0*	*22.0*	*20.4*	*0.1*	*0.1*	*0.0*
Utah	*203.0*	*6.8*	*0.4*	*7.1*	*17.6*	*16.5*	*2.8*	*6.0*	*2.2*	*7.3*	*7.5*	*22.2*	*104.8*	*1.7*	*0.1*	*0.0*
COUT BAX-E	291.5	5.7	0.3	10.5	18.5	49.6	3.1	5.3	4.2	2.8	15.6	40.3	133.6	1.7	0.3	0.0
Colorado	*86.7*	*0.0*	*0.1*	*1.1*	*1.7*	*32.6*	*0.6*	*0.7*	*2.1*	*0.2*	*5.0*	*22.0*	*20.4*	*0.1*	*0.1*	*0.0*
Utah	*204.8*	*5.7*	*0.2*	*9.4*	*16.8*	*17.0*	*2.5*	*4.6*	*2.1*	*2.6*	*10.6*	*18.3*	*113.2*	*1.6*	*0.2*	*0.0*

TABLE 3-58
ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES RESIDUAL IMPACTS FOR COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts (miles crossed)			
		Low	Low-Moderate	Moderate	Moderate-High
COUT BAX-B	279.2	14.7	208.2	55.0	1.3
Colorado	*86.7*	*2.7*	*75.0*	*8.9*	*0.1*
Utah	*192.5*	*12.0*	*133.2*	*46.1*	*1.2*
COUT BAX-C	289.7	14.5	218.5	54.9	1.8
Colorado	*86.7*	*2.7*	*75.0*	*8.9*	*0.1*
Utah	*203*	*11.8*	*143.5*	*46.0*	*1.7*
COUT BAX-E	291.5	13.0	223.5	53.3	1.7
Colorado	*86.7*	*2.7*	*75.0*	*8.9*	*0.1*
Utah	*204.8*	*10.3*	*148.5*	*44.4*	*1.6*

Results of Additional Analysis of Potential Impacts

Alternative COUT BAX-B in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in the big sagebrush, pinyon-juniper, mountain shrub, and shrub/shrub steppe vegetation communities, with smaller areas of loss in water, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, and riparian vegetation communities (Table 3-59).

TABLE 3-59
LONG-TERM SURFACE DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Vegetation Community Disturbed (acres)														
	Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
COUT BAX-B	117	9	141	336	808	59	112	78	129	215	732	2,047	22	3	2
Colorado	*0*	*2*	*19*	*29*	*562*	*10*	*12*	*36*	*3*	*86*	*379*	*351*	*2*	*2*	*0*
Utah	*117*	*7*	*122*	*307*	*246*	*48*	*100*	*41*	*126*	*129*	*353*	*1,695*	*21*	*2*	*2*
COUT BAX-C	115	9	139	327	831	58	113	73	127	212	748	2,119	31	3	0
Colorado	*0*	*2*	*19*	*29*	*552*	*10*	*12*	*36*	*3*	*85*	*372*	*345*	*2*	*2*	*0*
Utah	*115*	*7*	*120*	*298*	*279*	*47*	*102*	*37*	*124*	*127*	*376*	*1,774*	*29*	*2*	*0*
COUT BAX-E	94	5	173	304	815	51	87	69	46	256	662	2,195	28	5	0
Colorado	*0*	*2*	*18*	*28*	*536*	*10*	*12*	*35*	*3*	*82*	*361*	*335*	*2*	*2*	*0*
Utah	*94*	*3*	*154*	*276*	*279*	*41*	*76*	*35*	*43*	*174*	*301*	*1,860*	*26*	*3*	*0*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Vegetation clearing for Alternative COUT BAX-B would occur primarily in pinyon-juniper and mountain shrub vegetation communities and lesser extents would occur in aspen, montane forest, and riparian vegetation communities (Table 3-60).

TABLE 3-60
AREA OF VEGETATION CLEARING FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Vegetation Clearing (acres)	Vegetation Clearing (acres)				
		Aspen	Montane Forest	Mountain Shrub	Pinyon-Juniper	Riparian
COUT BAX-B	2,182	249	227	379	1,288	39
Colorado	*861*	*33*	*6*	*152*	*667*	*3*
Utah	*1,321*	*215*	*221*	*227*	*621*	*36*
COUT BAX-C	2,249	249	227	379	1,339	55
Colorado	*861*	*33*	*6*	*152*	*667*	*3*
Utah	*1,388*	*215*	*221*	*227*	*673*	*52*
COUT BAX-E	2,149	318	85	473	1,221	52
Colorado	*861*	*33*	*6*	*152*	*667*	*3*
Utah	*1,288*	*285*	*79*	*321*	*555*	*49*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Affected Environment (Utah)

Alternative COUT BAX-B in Utah is in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions. This alternative route predominantly crosses shrub/shrub steppe, but also large areas of barren/sparsely vegetated, big sagebrush, and pinyon-juniper vegetation communities. Smaller areas of agriculture, water, alpine, aspen, developed/disturbed, grassland, invasive, montane forest, mountain shrub, and riparian vegetation communities also are crossed by this alternative route (Table 3-57).

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT BAX-B in Utah after application of selective mitigation measures is shown in Table 3-58. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed this alternative route (Tables 3-57 and 3-58; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT BAX-B in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in aspen, barren/sparsely vegetated, big sagebrush, montane forest, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, water, alpine, developed/disturbed, grassland, invasive, and riparian vegetation communities (Table 3-59).

Vegetation clearing would occur primarily in aspen, montane forest, mountain shrub, and pinyon-juniper vegetation communities and a lesser extent would occur in riparian vegetation communities (Table 3-60).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-B could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT BAX-C

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT BAX-C in Colorado would be the same as those for Alternative COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah is in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions. This alternative route predominantly crosses shrub/shrub steppe but also large areas of barren/sparsely vegetated, big sagebrush, and pinyon-juniper vegetation communities. Smaller areas of agriculture, water, alpine, aspen, developed/disturbed, grassland, invasive, montane forest, mountain shrub, and riparian vegetation communities also are crossed by this alternative route (Table 3-57).

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT BAX-C in Utah after application of selective mitigation measures is shown in Table 3-58. Impacts are primarily

low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-57 and 3-58; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT BAX-C in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in aspen, barren/sparsely vegetated, big sagebrush, montane forest, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller areas in agriculture, water, alpine, developed/disturbed, grassland, invasive, and riparian vegetation communities (Table 3-59).

Vegetation clearing would occur primarily in the aspen, montane forest, mountain shrub, and pinyon-juniper vegetation communities and a lesser extent would occur in riparian vegetation communities (Table 3-60).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-C could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT BAX-E

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT BAX-E in Colorado would be the same as those for Alternative COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah is in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions. This alternative route predominantly crosses shrub/shrub steppe is the dominant vegetation community crossed by this alternative route but also large areas of barren/sparsely vegetated, big sagebrush, and pinyon-juniper vegetation communities. Small areas of agriculture, water, alpine, aspen, developed/disturbed, grassland, invasive, montane forest, mountain shrub, and riparian vegetation communities also are crossed (Table 3-57).

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT BAX-E in Utah after application of selective mitigation measures is shown in Table 3-58. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-57 and 3-58; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route

crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT BAX-E in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in aspen, barren/sparsely vegetated, big sagebrush, montane forest, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, water, alpine, developed/disturbed, grassland, invasive, riparian, and vegetation communities (Table 3-59).

Vegetation clearing would occur primarily in the aspen, montane forest, mountain shrub, and pinyon-juniper vegetation communities and a lesser extent would occur in riparian vegetation communities (Table 3-60).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-E could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Environmental Setting

The COUT route grouping is from U.S. Highway 40 in Colorado to Clover, Utah by way of the Uinta Basin (Map 2-1b). This grouping is predominantly in the Colorado Plateaus Ecoregion but crosses into the Wasatch and Uinta Mountains and Central Basin and Range ecoregions as it approaches Mona, Utah.

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A in Colorado is entirely in the Colorado Plateaus Ecoregion and predominantly crosses big sagebrush communities (Table 3-61). Smaller areas of barren/sparsely vegetated, invasive, pinyon-juniper, and shrub steppe vegetation communities also are crossed by these alternative routes.

TABLE 3-61
ALTERNATIVE ROUTE COMPARISON
FOR VEGETATION RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTE

Alternative Route	Total Miles	Vegetation Community (miles crossed)														
		Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative COUT-A and Route Variation																
COUT-A	206.0	19.7	0.6	6.4	6.1	79.2	2.3	0.9	8.4	3.4	17.9	28.2	26.1	4.0	2.8	0.0
Colorado	24.0	*0.0*	*0.0*	*0.0*	0.3	17.3	*0.0*	*0.0*	3.0	*0.0*	*0.0*	0.5	2.9	0.0	0.0	0.0
Utah	182.0	19.7	0.6	6.4	5.8	61.9	2.3	0.9	5.4	3.4	17.9	27.7	23.2	4.0	2.8	0.0
COUT-A-1	205.6	19.7	0.4	7.0	6.2	77.5	2.3	0.9	8.4	3.8	17.9	28.2	26.1	4.4	2.8	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*19.7*	*0.4*	*7.0*	*5.9*	*60.2*	*2.3*	*0.9*	*5.4*	*3.8*	*17.9*	*27.7*	*23.2*	*4.4*	*2.8*	*0.0*
Alternative COUT-B and Route Variations																
COUT-B	216.0	15.1	1.5	3.5	8.2	76.7	1.4	3.7	8.8	4.1	20.5	36.1	30.1	3.1	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*192.0*	*15.1*	*1.5*	*3.5*	*7.9*	*59.4*	*1.4*	*3.7*	*5.8*	*4.1*	*20.5*	*35.6*	*27.2*	*3.1*	*3.2*	*0.0*
COUT-B-1	212.7	15.1	1.1	4.7	7.8	71.5	1.2	3.9	8.8	8.1	21.6	33.1	29.7	2.9	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*188.7*	*15.1*	*1.1*	*4.7*	*7.5*	*54.2*	*1.2*	*3.9*	*5.8*	*8.1*	*21.6*	*32.6*	*26.8*	*2.9*	*3.2*	*0.0*
COUT-B-2	214.2	15.1	1.1	6.5	8.3	71.1	1.2	3.9	8.8	6.1	22.8	33.5	29.7	2.9	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*15.1*	*1.1*	*6.5*	*8.0*	*53.8*	*1.2*	*3.9*	*5.8*	*6.1*	*22.8*	*33.0*	*26.8*	*2.9*	*3.2*	*0.0*
COUT-B-3	213.9	15.1	1.1	10.1	7.9	69.5	1.2	3.5	8.8	5.2	22.1	33.6	29.7	2.9	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*15.1*	*1.1*	*10.1*	*7.6*	*52.2*	*1.2*	*3.5*	*5.8*	*5.2*	*22.1*	*33.1*	*26.8*	*2.9*	*3.2*	*0.0*
COUT-B-4	214.2	15.1	1.1	7.4	7.9	71.6	1.2	4.0	8.8	6.1	21.8	33.4	29.7	2.9	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*15.1*	*1.1*	*7.4*	*7.6*	*54.3*	*1.2*	*4.0*	*5.8*	*6.1*	*21.8*	*32.9*	*26.8*	*2.9*	*3.2*	*0.0*
COUT-B-5	213.9	15.1	1.1	9.2	8.3	69.0	1.2	3.4	8.8	5.2	23.1	33.7	29.7	2.9	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.3*	*17.3*	*0.0*	*0.0*	*3.0*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*15.1*	*1.1*	*9.2*	*8.0*	*51.7*	*1.2*	*3.4*	*5.8*	*5.2*	*23.1*	*33.2*	*26.8*	*2.9*	*3.2*	*0.0*

TABLE 3-61
ALTERNATIVE ROUTE COMPARISON
FOR VEGETATION RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTE

Alternative Route	Total Miles	Vegetation Community (miles crossed)														
		Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative COUT-C and Route Variations																
COUT-C	209.8	5.5	0.6	8.3	8.6	67.2	1.8	3.4	5.1	2.4	20.9	37.5	47.0	1.1	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*185.0*	*5.5*	*0.6*	*8.3*	*8.4*	*47.8*	*1.7*	*3.4*	*3.4*	*2.4*	*20.9*	*37.0*	*44.1*	*1.1*	*0.3*	*0.1*
COUT-C-1	206.4	5.2	0.0	7.6	7.9	61.3	1.6	3.9	5.1	11.3	21.2	33.4	46.6	0.9	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*5.2*	*0.0*	*7.6*	*7.7*	*41.9*	*1.5*	*3.9*	*3.4*	*11.3*	*21.2*	*32.9*	*43.7*	*0.9*	*0.3*	*0.1*
COUT-C-2	207.9	5.2	0.0	9.4	8.4	60.9	1.6	3.9	5.1	9.3	22.4	33.8	46.6	0.9	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*5.2*	*0.0*	*9.4*	*8.2*	*41.5*	*1.5*	*3.9*	*3.4*	*9.3*	*22.4*	*33.3*	*43.7*	*0.9*	*0.3*	*0.1*
COUT-C-3 (Agency Preferred Alternative)	207.6	5.2	0.0	12.1	8.4	58.8	1.6	3.4	5.1	8.4	22.7	34.0	46.6	0.9	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*5.2*	*0.0*	*12.1*	*8.2*	*39.4*	*1.5*	*3.4*	*3.4*	*8.4*	*22.7*	*33.5*	*43.7*	*0.9*	*0.3*	*0.1*
COUT-C-4	207.9	5.2	0.2	8.5	8.8	62.0	1.6	3.8	5.1	6.3	22.0	36.5	46.6	0.9	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*5.2*	*0.2*	*8.5*	*8.6*	*42.6*	*1.5*	*3.8*	*3.4*	*6.3*	*22.0*	*36.0*	*43.7*	*0.9*	*0.3*	*0.1*
COUT-C-5	207.6	5.2	0.2	11.2	8.8	59.9	1.6	3.3	5.1	5.4	22.3	36.7	46.6	0.9	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*5.2*	*0.2*	*11.2*	*8.6*	*40.5*	*1.5*	*3.3*	*3.4*	*5.4*	*22.3*	*36.2*	*43.7*	*0.9*	*0.3*	*0.1*
Alternatives COUT-H and COUT-I																
COUT-H (Applicant Preferred Alternative)	200.6	6.5	0.5	16.1	8.2	60.2	1.9	4.0	5.1	6.6	11.8	31.2	47.3	0.6	0.4	0.2
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*175.8*	*6.5*	*0.5*	*16.1*	*8.0*	*40.8*	*1.8*	*4.0*	*3.4*	*6.6*	*11.8*	*30.7*	*44.4*	*0.6*	*0.4*	*0.2*
COUT-I	240.2	7.5	1.6	14.0	9.6	65.8	6.8	5.4	5.3	9.6	9.6	34.3	69.7	0.6	0.3	0.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.2*	*19.4*	*0.1*	*0.0*	*1.7*	*0.0*	*0.0*	*0.5*	*2.9*	*0.0*	*0.0*	*0.0*
Utah	*215.4*	*7.5*	*1.6*	*14.0*	*9.4*	*46.4*	*6.7*	*5.4*	*3.6*	*9.6*	*9.6*	*33.8*	*66.8*	*0.6*	*0.3*	*0.1*

Environmental Consequences (Colorado)

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-A in Colorado after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush and smaller areas of shrub/shrub steppe and

pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses barren/sparsely vegetated vegetation communities.

TABLE 3-62
ALTERNATIVE ROUTE COMPARISON
FOR VEGETATION RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts (miles crossed)			
		Low	Low-Moderate	Moderate	Moderate-High
Alternative COUT-A and Route Variation					
COUT-A	206.0	30.4	133.5	38.1	4.0
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*182.0*	*27.4*	*112.8*	*37.8*	*4.0*
COUT-A-1	205.6	30.4	131.8	39.0	4.4
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*181.6*	*27.4*	*111.1*	*38.7*	*4.4*
Alternative COUT-B and Route Variations					
COUT-B	216.0	25.3	142.9	44.7	3.1
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*192.0*	*22.3*	*122.2*	*44.4*	*3.1*
COUT-B-1	212.7	25.1	134.3	50.4	2.9
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*188.7*	*22.1*	*113.6*	*50.1*	*2.9*
COUT-B-2	214.2	25.1	134.3	51.9	2.9
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*190.2*	*22.1*	*113.6*	*51.6*	*2.9*
COUT-B-3	213.9	25.1	132.8	53.1	2.9
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*189.9*	*22.1*	*112.1*	*52.8*	*2.9*
COUT-B-4	214.2	25.1	134.7	51.5	2.9
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*190.2*	*22.1*	*114.0*	*51.2*	*2.9*
COUT-B-5	213.9	25.1	132.4	53.5	2.9
Colorado	*24.0*	*3.0*	*20.7*	*0.3*	*0.0*
Utah	*189.9*	*22.1*	*111.7*	*53.2*	*2.9*

TABLE 3-62 ALTERNATIVE ROUTE COMPARISON FOR VEGETATION RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES					
		Residual Impacts (miles crossed)			
Alternative Route	**Total Miles**	**Low**	**Low-Moderate**	**Moderate**	**Moderate-High**
Alternative COUT-C and Route Variation					
COUT-C	209.8	12.4	151.7	44.6	1.1
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*185.0*	*10.6*	*128.9*	*44.4*	*1.1*
COUT-C-1	206.4	11.9	141.3	52.3	0.9
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*181.6*	*10.1*	*118.5*	*52.1*	*0.9*
COUT-C-2	207.9	11.9	141.3	53.8	0.9
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*183.1*	*10.1*	*118.5*	*53.6*	*0.9*
COUT-C-3 (Agency Preferred Alternative)	207.6	11.9	139.4	55.4	0.9
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*182.8*	*10.1*	*116.6*	*55.2*	*0.9*
COUT-C-4	207.9	11.9	145.1	50.0	0.9
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*183.1*	*10.1*	*122.3*	*49.8*	*0.9*
COUT-C-5	207.6	11.9	143.2	51.6	0.9
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*182.8*	*10.1*	*120.4*	*51.4*	*0.9*
Alternatives COUT-H and COUT-I					
COUT-H (Applicant Preferred Alternative	200.6	13.5	138.7	47.8	0.6
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*175.8*	*11.7*	*115.9*	*47.6*	*0.6*
COUT-I	240.2	19.6	169.8	50.2	0.6
Colorado	*24.8*	*1.8*	*22.8*	*0.2*	*0.0*
Utah	*215.4*	*17.8*	*147.0*	*50.0*	*0.6*

Results of Additional Analysis of Potential Impacts

Alternatives COUT-A in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush vegetation communities, smaller areas of loss in barren/sparsely vegetated, invasive, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-63).

TABLE 3-63
LONG-TERM SURFACE DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Vegetation Community Disturbed (acres)														
	Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative COUT-A and Route Variation															
COUT-A	364	11	118	113	1,465	43	17	155	63	331	522	483	74	52	0
Colorado	*0*	*0*	*0*	*6*	*320*	*0*	*0*	*56*	*0*	*0*	*9*	*54*	*0*	*0*	*0*
Utah	*364*	*11*	*118*	*107*	*1,145*	*43*	*17*	*100*	*63*	*331*	*512*	*429*	*74*	*52*	*0*
COUT-A-1	364	7	129	115	1,433	43	17	155	70	331	522	483	81	52	0
Colorado	*0*	*0*	*0*	*6*	*320*	*0*	*0*	*56*	*0*	*0*	*9*	*54*	*0*	*0*	*0*
Utah	*364*	*7*	*129*	*109*	*1,113*	*43*	*17*	*100*	*70*	*331*	*512*	*429*	*81*	*52*	*0*
Alternative COUT-B and Route Variations															
COUT-B	276	27	64	150	1,403	26	68	161	75	375	660	551	57	59	0
Colorado	*0*	*0*	*0*	*6*	*317*	*0*	*0*	*55*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*276*	*27*	*64*	*145*	*1,087*	*26*	*68*	*106*	*75*	*375*	*651*	*498*	*57*	*59*	*0*
COUT-B-1	278	20	87	144	1,317	22	72	162	149	398	610	547	53	59	0
Colorado	*0*	*0*	*0*	*6*	*319*	*0*	*0*	*55*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*278*	*20*	*87*	*138*	*998*	*22*	*72*	*107*	*149*	*398*	*600*	*494*	*53*	*59*	*0*
COUT-B-2	278	20	120	153	1,307	22	72	162	112	419	616	546	53	59	0
Colorado	*0*	*0*	*0*	*6*	*318*	*0*	*0*	*55*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*278*	*20*	*120*	*147*	*989*	*22*	*72*	*107*	*112*	*419*	*607*	*493*	*53*	*59*	*0*
COUT-B-3	278	20	186	145	1,277	22	64	162	96	406	618	546	53	59	0
Colorado	*0*	*0*	*0*	*6*	*318*	*0*	*0*	*55*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*278*	*20*	*186*	*140*	*959*	*22*	*64*	*107*	*96*	*406*	*608*	*493*	*53*	*59*	*0*
COUT-B-4	277	20	136	145	1,315	22	74	162	112	401	614	546	53	59	0
Colorado	*0*	*0*	*0*	*6*	*318*	*0*	*0*	*55*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*277*	*20*	*136*	*140*	*998*	*22*	*74*	*107*	*112*	*401*	*604*	*492*	*53*	*59*	*0*
COUT-B-5	284	21	173	156	1,298	23	64	166	98	435	634	559	55	60	0
Colorado	*0*	*0*	*0*	*6*	*325*	*0*	*0*	*56*	*0*	*0*	*9*	*55*	*0*	*0*	*0*
Utah	*284*	*21*	*173*	*151*	*973*	*23*	*64*	*109*	*98*	*435*	*625*	*504*	*55*	*60*	*0*

TABLE 3-63
LONG-TERM SURFACE DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Vegetation Community Disturbed (acres)														
	Agriculture	Alpine	Aspen	Barren/Sparsely Vegetated	Big Sagebrush	Developed/Disturbed	Grassland	Invasive	Montane Forest	Mountain Shrub	Pinyon-Juniper	Shrub/Shrub Steppe	Riparian	Water	Wetland
Alternative COUT-C and Route Variations															
COUT-C	105	12	159	165	1,288	35	65	98	46	401	719	901	21	6	2
Colorado	*0*	*0*	*0*	*4*	*372*	*2*	*0*	*33*	*0*	*0*	*10*	*56*	*0*	*0*	*0*
Utah	*105*	*12*	*159*	*161*	*916*	*33*	*65*	*65*	*46*	*401*	*709*	*845*	*21*	*6*	*2*
COUT-C-1	101	0	147	153	1,185	31	75	99	218	410	646	901	17	6	2
Colorado	*0*	*0*	*0*	*4*	*375*	*2*	*0*	*33*	*0*	*0*	*10*	*56*	*0*	*0*	*0*
Utah	*101*	*0*	*147*	*149*	*810*	*29*	*75*	*66*	*218*	*410*	*636*	*845*	*17*	*6*	*2*
COUT-C-2	100	0	181	162	1,174	31	75	98	179	432	652	899	17	6	2
Colorado	*0*	*0*	*0*	*4*	*374*	*2*	*0*	*33*	*0*	*0*	*10*	*56*	*0*	*0*	*0*
Utah	*100*	*0*	*181*	*158*	*800*	*29*	*75*	*66*	*179*	*432*	*642*	*843*	*17*	*6*	*2*
COUT-C-3 (Agency Preferred Alternative)	101	0	235	163	1,144	31	66	99	163	442	662	907	18	6	2
Colorado	*0*	*0*	*0*	*4*	*378*	*2*	*0*	*33*	*0*	*0*	*10*	*56*	*0*	*0*	*0*
Utah	*101*	*0*	*235*	*160*	*767*	*29*	*66*	*66*	*163*	*442*	*652*	*850*	*18*	*6*	*2*
COUT-C-4	101	4	165	171	1,206	31	74	99	123	428	710	906	18	6	2
Colorado	*0*	*0*	*0*	*4*	*377*	*2*	*0*	*33*	*0*	*0*	*10*	*56*	*0*	*0*	*0*
Utah	*101*	*4*	*165*	*167*	*828*	*29*	*74*	*66*	*123*	*428*	*700*	*850*	*18*	*6*	*2*
COUT-C-5	98	4	211	166	1,128	30	62	96	102	420	691	877	17	6	2
Colorado	*0*	*0*	*0*	*4*	*365*	*2*	*0*	*32*	*0*	*0*	*9*	*55*	*0*	*0*	*0*
Utah	*98*	*4*	*211*	*162*	*762*	*28*	*62*	*64*	*102*	*420*	*682*	*823*	*17*	*6*	*2*
Alternatives COUT-H and COUT-I															
COUT-H (Applicant Preferred Alternative)	120	9	297	151	1,109	35	74	94	122	217	575	872	11	7	4
Colorado	*0*	*0*	*0*	*4*	*357*	*2*	*0*	*31*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*120*	*9*	*297*	*147*	*752*	*33*	*74*	*63*	*122*	*217*	*566*	*818*	*11*	*7*	*4*
COUT-I	136	29	254	174	1,194	123	98	96	174	174	622	1,265	11	5	2
Colorado	*0*	*0*	*0*	*4*	*352*	*2*	*0*	*31*	*0*	*0*	*9*	*53*	*0*	*0*	*0*
Utah	*136*	*29*	*254*	*171*	*842*	*122*	*98*	*65*	*174*	*174*	*613*	*1,212*	*11*	*5*	*2*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Vegetation clearing for Alternative COUT-A would occur in pinyon-juniper vegetation communities (Table 3-64).

TABLE 3-64
AREA OF VEGETATION CLEARING FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Vegetation Clearing (acres)	Vegetation Clearing (acres)				
		Aspen	Montane Forest	Mountain Shrub	Pinyon-Juniper	Riparian
Alternative COUT-A and Route Variation						
COUT-A	1,815	194	103	542	855	121
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*1,800*	*194*	*103*	*542*	*839*	*121*
COUT-A-1	1,858	212	115	542	855	133
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*1,842*	*212*	*115*	*542*	*839*	*133*
Alternative COUT-B and Route Variations						
COUT-B	2,039	106	124	621	1,094	94
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,024*	*106*	*124*	*621*	*1,079*	*94*
COUT-B-1	2,133	142	246	655	1,003	88
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,118*	*142*	*246*	*655*	*988*	*88*
COUT-B-2	2,176	197	185	691	1,015	88
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,161*	*197*	*185*	*691*	*1,000*	*88*
COUT-B-3	2,239	306	158	670	1,018	88
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,224*	*306*	*158*	*670*	*1,003*	*88*
COUT-B-4	2,170	224	185	661	1,012	88
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,155*	*224*	*185*	*661*	*997*	*88*
COUT-B-5	2,246	279	158	700	1,021	88
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,230*	*279*	*158*	*700*	*1,006*	*88*

TABLE 3-64
AREA OF VEGETATION CLEARING FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Vegetation Clearing (acres)	Vegetation Clearing (acres)				
		Aspen	Montane Forest	Mountain Shrub	Pinyon-Juniper	Riparian
Alternative COUT-C and Route Variations						
COUT-C	2,127	252	73	633	1,136	33
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,112*	*252*	*73*	*633*	*1,121*	*33*
COUT-C-1	2,255	230	342	642	1,012	27
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,239*	*230*	*342*	*642*	*997*	*27*
COUT-C-2	2,297	285	282	679	1,024	27
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,282*	*285*	*282*	*679*	*1,009*	*27*
COUT-C-3 (Agency Preferred Alternative)	2,367	367	255	688	1,030	27
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,352*	*367*	*255*	*688*	*1,015*	*27*
COUT-C-4	2,249	258	191	667	1,106	27
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,233*	*258*	*191*	*667*	*1,091*	*27*
COUT-C-5	2,318	339	164	676	1,112	27
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,303*	*339*	*164*	*676*	*1,097*	*27*
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	2,009	488	200	358	946	18
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*1,994*	*488*	*200*	*358*	*930*	*18*
COUT-I	2,064	424	291	291	1,039	18
Colorado	*15*	*0*	*0*	*0*	*15*	*0*
Utah	*2,049*	*424*	*291*	*291*	*1,024*	*18*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Alternative COUT-A Route Variation (COUT-A-1)

Between Alternative COUT-A and Route Variation COUT-A-1, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64).

Affected Environment (Utah)

Alternative COUT-A and Route Variation COUT-A-1 in Utah are in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions and predominantly cross agriculture, big sagebrush, mountain shrub, pinyon-juniper, and shrub steppe vegetation communities. Smaller areas of alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, water, and wetland vegetation communities also are crossed by this alternative route (Table 3-61).

Environmental Consequences (Utah)

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-A in Utah after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation.

Results of Additional Analysis of Potential Impacts

Alternative COUT-A in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. Total permanent loss of vegetative cover is shown in Table 3-63. These losses would occur predominantly in aspen, big sagebrush, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller areas of loss in agriculture, alpine, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities.

Vegetation clearing would occur in aspen, montane forest, mountain shrub, pinyon-juniper, and riparian vegetation communities (Table 3-64).

Alternative COUT-A Route Variation (COUT-A-1)

Between Alternative COUT-A and Route Variation COUT-A-1, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plant Report which is available for review and download from the Project website. The analysis found that Alternative COUT-A and Route Variation COUT-A-1 could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT-B in Colorado would be the same as those for Alternative COUT-A in Colorado.

Between Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64).

Affected Environment (Utah)

Alternative COUT-B in Utah is in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions and predominantly crosses big sagebrush, mountain shrub, pinyon-juniper, and shrub steppe communities (Table 3-61). Smaller areas of agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also are crossed by this alternative route.

Environmental Consequences (Utah)

Alternative COUT-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-B in Utah after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT-B in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. Total permanent loss of vegetative cover is shown in Table 3-63. These losses would occur predominantly in big sagebrush, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller extents of vegetative cover loss occurring in agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities.

Vegetation clearing would occur in aspen, montane forest, mountain shrub, pinyon-juniper, and riparian vegetation communities (Table 3-64).

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Between Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-B and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT-B and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C in Colorado is entirely in the Colorado Plateaus Ecoregion and predominantly crosses big sagebrush communities (Table 3-61). Smaller areas of barren/sparsely vegetated, developed/disturbed, invasive, pinyon-juniper, and shrub steppe vegetation communities are crossed by this alternative route in Colorado.

Environmental Consequences (Colorado)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-C in Colorado after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush and smaller areas of shrub/shrub steppe and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses barren/sparsely vegetated vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT-C in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush vegetation communities, with smaller areas of loss occurring in barren/sparsely vegetated, developed/disturbed, invasive, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-63).

Vegetation clearing would occur in pinyon-juniper vegetation communities (Table 3-64).

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Between Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64.

Affected Environment (Utah)

Alternative COUT-C in Utah is in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions and predominantly crosses big sagebrush, mountain shrub, pinyon-juniper, and shrub steppe vegetation communities (Table 3-61). Smaller areas of agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also are crossed by this alternative route.

Environmental Consequences (Utah)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-C in Utah after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation

communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT-C in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. Total permanent loss of vegetative cover is shown in Table 3-63. These losses would occur predominantly in big sagebrush, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller extents of vegetative cover loss occurring in agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities.

Vegetation clearing would occur in Utah in aspen, montane forest, mountain shrub, pinyon-juniper, and riparian vegetation communities (Table 3-64).

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Between Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5, minor variations exist in the number of miles of vegetation communities crossed and extent of impact in acres from proposed Project activities (refer to Tables 3-61, 3-63, and 3-64).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-C and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT-C and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment and Environmental Consequences (Colorado)

Affected Environment and Environmental Consequences for this alternative route in Colorado are the same as for Alternative COUT-C as the routing of these alternative routes does not differ (Tables 3-62 to 3-64).

Affected Environment (Utah)

Alternative COUT-H in Utah is in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions and predominantly crosses aspen, big sagebrush, mountain shrub, pinyon-juniper, and shrub steppe vegetation communities (Table 3-61). Smaller areas of agriculture, alpine, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also are crossed by this alternative route.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-H in Utah after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation.

Results of Additional Analysis of Potential Impacts

Alternative COUT-H in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. Total permanent loss of vegetative cover is shown in Table 3-63. These losses would occur predominantly in aspen, big sagebrush, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller extents of vegetative cover loss occurring in agriculture, alpine, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities.

Vegetation clearing would occur primarily in aspen, montane forest, mountain shrub, pinyon-juniper, and riparian vegetation communities (Table 3-64).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-H and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT-H and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-I

Affected Environment and Environmental Consequences Colorado

Affected Environment and Environmental Consequences for this alternative route in Colorado are the same as for Alternative COUT-C as the routing of these alternative routes does not differ (Tables 3-62 to 3-64.

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-I in Colorado after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush and smaller areas of shrub/shrub steppe and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses barren/sparsely vegetated vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT-I in Colorado would result in permanent loss of vegetative cover due to access road and transmission line construction. These losses would occur predominantly in big sagebrush vegetation communities, with smaller areas of loss occurring in barren/sparsely vegetated, developed/disturbed, invasive, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-63).

Vegetation clearing would occur in pinyon-juniper vegetation communities (Table 3-64).

Affected Environment (Utah)

Alternative COUT-I in Utah is in the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions and predominantly crosses aspen, barren/sparsely vegetated, big sagebrush, pinyon-juniper, and shrub steppe vegetation communities (Table 3-61). Smaller areas of agriculture, alpine, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, water, and wetland vegetation communities also are crossed by this alternative route.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The extent of potential residual impacts on vegetation communities crossed by Alternative COUT-I in Utah after application of selective mitigation measures is shown in Table 3-62. Impacts are primarily low-moderate due to the predominance of big sagebrush, shrub/shrub steppe, and pinyon-juniper vegetation communities crossed by this alternative route (Tables 3-61 and 3-62; refer to Table 3-52 for residual impacts by vegetation community). Moderate impacts would occur where this alternative route crosses water, alpine, aspen, barren/sparsely vegetated, grassland, montane forest, and mountain shrub vegetation communities. Moderate-high impacts would occur where this alternative route crosses riparian vegetation communities.

Results of Additional Analysis of Potential Impacts

Alternative COUT-I in Utah would result in permanent loss of vegetative cover due to access road and transmission line construction. Total permanent loss of vegetative cover is shown in Table 3-63. These losses would occur predominantly in aspen, barren/sparsely vegetated, big sagebrush, montane forest, mountain shrub, pinyon-juniper, and shrub/shrub steppe vegetation communities, with smaller extents of vegetative cover loss occurring in agriculture, alpine, developed/disturbed, grassland, invasive, riparian, water, and wetland vegetation communities.

Vegetation clearing would occur primarily in aspen, montane forest, mountain shrub, pinyon-juniper, and riparian vegetation communities (Table 3-64).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-I and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT-I and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

3.2.5.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A (MV-7) would be located on the Wyoming/Colorado state line in sagebrush, grassland, and pinyon-juniper vegetation communities.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Powder Wash series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-55).

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B (MV-7) would be located where Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 diverge in Nine Mile Basin in Colorado. The Siting Area would be located in sagebrush, grassland, and pinyon-juniper vegetation communities.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Nine Mile Basin series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-55).

Siting Area C – Maybell

Affected Environment

Siting Area C (MV-7) would be located where Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 diverge in the Tuttle Ranch Conservation Easement area. Vegetation communities in this area are predominantly riparian, agricultural, big sagebrush, shrub/shrub steppe, barren/sparsely vegetated, grassland, and pinyon-juniper.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Maybell series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-55).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D (MV-7) would be located just south of U.S. Highway 40, west of Craig, Colorado. This area is dominated by sagebrush, shrub/shrub steppe and pinyon-juniper vegetation communities.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Bell Rock series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-55).

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G (MV-7) would be located in an area previously disturbed by the I-70 corridor and U.S. Highway 6; approximately 5 miles west of the Green River. Vegetation communities are predominantly barren/sparsely vegetated, shrub/shrub steppe, and pinyon juniper.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Green River series compensation station is included in the disturbance analysis for Alternative COUT BAX-B (Table 3-59).

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F (MV-7) would be located in an area previously disturbed by agriculture and U.S. Highway 40 in the vicinity of Roosevelt. Vegetation communities are predominantly agricultural land, barren, sage-brush and shrub/shrubsteppe vegetation communities.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Roosevelt series compensation station is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1 (Table 3-63).

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E (MV-7) would be located in an area previously disturbed by oil and gas development, and the Bonanza Power Plant. Vegetation communities are predominantly big sagebrush and shrub/shrub steppe.

Environmental Consequences

The estimated area of disturbance (in acres) to vegetation communities from the Bonanza series compensation station is included in the disturbance analysis for Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 (Table 3-63).

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.6 Special Status Plants

3.2.6.1 Introduction and Regulatory Framework

Special status plant species are those federally listed as endangered, threatened, and candidates for protection, or proposed for protection under the ESA or those considered sensitive by either the BLM or USFS. This section addresses potential impacts on special status plants that could result from construction, operation, and maintenance of the Project.

3.2.6.1.1 Regulatory Framework

Regulations that address and govern impacts on special status plant resources include the ESA, BLM and USFS handbooks and manuals, and various BLM and USFS land-management plans. Implementation of the Project would be consistent with statutes, regulations, plans, programs, and policies of affiliated tribes, federal agencies, and state and local governments. Relevant regulations for special status plant resources are presented in this section.

Federal

- The ESA authorizes the FWS to protect plant and wildlife species and the habitats on which they depend. It requires federal agencies to ensure their actions (including permitting) are not likely to jeopardize the continued existence of a listed species or result in the destruction of the species' habitat.
- BLM Special Status Species Management Policy Manual 6840 (6840 Policy) (Rel. 6-125) provides management direction and guidance for the conservation of special status species and their habitats. Under this policy, special status species include animal and plant species listed as threatened or endangered, proposed for listing, or candidates for listing under the provisions of the ESA; those listed as sensitive species by a state; and those listed by a BLM State Director as sensitive. The objective of this policy is to ensure actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, under provisions of the ESA.
- BLM RMPs and Management Framework Plans for Wyoming, including Rawlins Field Office (2008); for Colorado, including White River (1997, as amended), Little Snake (2011), and Grand Junction (1987, as amended) Field Offices; for Utah, including Richfield (2008), Fillmore (1987), Moab (2008), Price (2008) and Vernal (2008) Field Offices, and Salt Lake District (1990), specify regulations and goals for management of BLM-administered lands and set restrictions to protect special status plants and the habitats on which they depend.
- USFS Manual 2670 directs each Regional Forester to designate sensitive species on public lands administered by USFS. Per the manual, sensitive species are defined "as plant or animal species identified by a Regional Forester for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce an existing distribution of the species." Additionally, as stated in Manual 2670, it is USFS policy "to develop

and implement management practices to ensure that species do not become threatened or endangered because of USFS actions; maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands; and develop and implement management objectives for populations and/or habitat of sensitive species."

- USFS Invasive Species Management Manual 2900 sets forth National Forest System policy, responsibilities, and direction for the prevention, detection, control, and restoration of effects from aquatic and terrestrial invasive species (including vertebrates, invertebrates, plants, and pathogens).
- LRMPs for the Ashley (1986, as amended), Manti-La Sal (1986, as amended), and Uinta (2003, as amended) National Forests identify goals for forest health and constraints on resource uses to meet these goals.
- The Platte River Recovery Implementation Program was implemented in 1997 through a cooperative agreement between the Department of the Interior and the States of Colorado, Nebraska, and Wyoming (Platte River Recovery Program 2006). The long-term goal of the program is to improve and maintain habitats for target species and other ESA-listed species that occur in the lower Platte River, including western prairie fringed orchid (Platte River Recovery Program 2006).

3.2.6.2 Issues Identified for Analysis

Issues related to potential effects of the Project on special status plant resources, identified during scoping and in coordination with agency personnel, are listed in Table 3-65.

TABLE 3-65
SPECIAL STATUS PLANT ISSUES IDENTIFIED FOR ANALYSIS

Issue Identified	Analysis Considerations
Potential impacts on federally listed threatened, endangered, proposed, and candidate plant species, including: ▪ Loss of habitat ▪ Direct impacts on individuals ▪ Increased potential for illegal collection of individuals due to increased habitat accessibility	▪ Determining number of miles of known or potential habitat crossed by Project alternative route centerlines ▪ Determining number of known element occurrences within 1 mile of alternative route centerlines ▪ Determining amount of potential habitat affected by Project activities, including access road construction, transmission line construction, and clearing of tall vegetation ▪ Qualitative analysis of direct threats to individuals due to Project activities and potential increased collection pressure due to increased public access to habitat
Potential impacts on Bureau of Land Management and U.S. Forest Service sensitive plant species, including: ▪ Loss of habitat ▪ Direct impacts on individuals ▪ Increased potential for illegal collection of individuals due to increased habitat accessibility	▪ Determining number of known element occurrences and occupied habitat areas within 1 mile of alternative route centerline corridors ▪ Qualitative analysis of direct threats to individuals due to Project activities and potential increased collection pressure due to increased public access to habitat

3.2.6.3 Regional Setting

Descriptions of ecoregions and general ecological conditions in the Project area are presented in Section 3.2.5.3. Many endemic plants (species found only in a specific geographic area) occur in the Project area due to highly variable topographic, soil, and climatic conditions. The Colorado Plateaus Ecoregion, which

encompasses the majority of the central part of the Project area, is especially known for a high degree of plant endemism due to its unique climate, geography, soil types, and geologic history (Welsh 1979).

3.2.6.4 Study Methodology

3.2.6.4.1 Inventory

To assess potential impacts on special status plant resources, a list of special status plant species that potentially occur in the study corridors was compiled from several sources, including:

Federal Threatened, Endangered, and Candidate Species

- Wyoming – Carbon (FWS 2011a) and Sweetwater (FWS 2010a) counties
- Colorado – Garfield, Mesa, Moffatt, and Rio Blanco counties (FWS 2010b)
- Utah – Carbon, Duchesne, Emery, Grand, Juab, Uintah, Utah, and Wasatch counties (FWS 2011b)

Bureau of Land Management Sensitive Species

- Wyoming – *BLM Wyoming Sensitive Species Policy and List* (Rawlins Field Office) (BLM 2010b)
- Colorado – *Colorado BLM State Director's Sensitive Species List by Field Station* (Little Snake, White River, Grand Junction Field Offices) (BLM 2009c)
- Utah – *Interim Bureau of Land Management Sensitive Plant Species List for Utah*, February 2011 (BLM 2011d)

U.S. Forest Service Sensitive Species

- Region 4 – Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species Known and Suspected Distribution by Forest (USFS 2013a)

Distribution and occurrence data for special status plants were collected from the Wyoming, Colorado, and Utah state heritage programs; the BLM; and the USFS to identify special status plants known to occur or with potential habitat in the proposed Project area. Agency personnel were also consulted to further refine the list of species that could potentially occur in the Project area. Relevant published literature was also referenced to determine habitat suitability in the corridors for some species where gaps in occurrence data were identified.

The refined special status species list includes a total of 61 plant species known to occur or with the potential to occur in the Project area or with the potential to be indirectly affected by Project activities (Table 3-66). Appendix E includes detailed species descriptions, life history, and occurrence information for these species.

TABLE 3-66
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR WITHIN ALTERNATIVE ROUTE STUDY CORRIDORS

Common Name	Scientific Name	Federally Listed	Bureau of Land Management Sensitive			U.S. Forest Service Sensitive		
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest
Federally Listed Threatened, Endangered, Proposed, or Candidate Species[1]								
Barneby ridge-cress	*Lepidium barnebyanum*	E						
Cisco milkvetch	*Astragalus sabulosus* var. *sabulosus*	P	✓		✓			
Clay phacelia	*Phacelia argillacea*	E						
Clay reed-mustard	*Schoenocrambe argillacea*	T						
Deseret milkvetch	*Astragalus desereticus*	T						
Graham's beardtongue	*Penstemon grahamii*	PT			✓			
Jones' cycladenia	*Cycladenia humilis* var. *jonesii*	T						
Pariette cactus	*Sclerocactus brevispinus*	T						
San Rafael cactus	*Pediocactus despainii*	E						
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	E						
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	T						
Ute ladies'-tresses	*Spiranthes diluvialis*	T						
Western prairie fringed orchid	*Platanthera praeclara*	T						
White River beardtongue	*Penstemon scariosus* var. *albifluvis*	PT		✓	✓			
Bureau of Land Management and U.S. Forest Service Sensitive Species[1]								
Argyle Canyon phacelia	*Phacelia argylensis*				✓			
Barneby's cat's-eye	*Cryptantha barnebyi*				✓			
Beaver Rim phlox	*Phlox pungens*		✓					
Bolander's camissonia	*Camissonia bolanderi*				✓			
Caespitose cat's-eye	*Cryptantha caespitosa*			✓				
Canyon sweet-vetch	*Hedysarum occidentale* var. *canone*						✓	
Carrington daisy[2]	*Erigeron carringtoniae*						✓	
Cedar Rim thistle	*Cirsium aridum*		✓					
Creutzfeldt's cat's-eye	*Cryptantha creutzfeldtii*				✓		✓	
Debris milkvetch	*Astragalus detritalis*			✓				
Dense twinpod	*Physaria condensata*		✓					
Dolores River skeleton-plant	*Lygodesmia doloresensis*			✓	✓			
Duchesne milkvetch	*Astragalus duchesnensis*			✓				
Ephedra buckwheat	*Eriogonum ephedroides*			✓				

TABLE 3-66
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR WITHIN ALTERNATIVE ROUTE STUDY CORRIDORS

Common Name	Scientific Name	Federally Listed	Bureau of Land Management Sensitive			U.S. Forest Service Sensitive		
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest
Ferron's milkvetch	*Astragalus musiniensis*			✓				
Gibbens' beardtongue	*Penstemon gibbensii*		✓	✓				
Goodrich's blazingstar	*Mentzelia goodrichii*				✓	✓		
Goodrich's columbine[3]	*Aquilegia scopulorum* var. *goodrichii*				✓			
Graham's cat's-eye	*Cryptantha grahamii*				✓			
Grand Junction suncup	*Camissonia eastwoodiae*			✓				
Green River greenthread	*Thelesperma caespitosum*		✓		✓	✓		
Hairy Townsend-daisy[4]	*Townsendia strigosa* var. *prolixa*				✓			
Hamilton's milkvetch	*Astragalus hamiltonii*				✓			
Horseshoe milkvetch	*Astragalus equisolensis*			✓	✓			
Huber's pepperwort	*Lepidium huberi*				✓			
Jones' bluestar	*Amsonia jonesii*			✓				
Laramie false sagebrush	*Sphaeromeria simplex*		✓					
Large-fruited bladderpod	*Lesquerella macrocarpa*		✓					
Ligulate feverfew	*Parthenium ligulatum*			✓				
Meadow pussytoes	*Antennaria arcuata*		✓					
Narrowleaf evening primrose	*Oenothera acutissima*			✓				
Narrow-stem gilia	*Gilia stenothyrsa*			✓				
Ownbey's thistle	*Cirsium ownbeyi*		✓					
Persistent-sepal yellowcress	*Rorippa calycina*		✓					
Piceance bladderpod	*Lesquerella parviflora*			✓				
Psoralea globemallow	*Sphaeralcea psoraloides*				✓			
Racemose milkvetch	*Astragalus racemosus* var. *treleasei*		✓					
Rock hymenoxys	*Hymenoxys lapidicola*				✓			
Rollins' cat's-eye	*Cryptantha rollinsii*			✓				
Spanish bayonet	*Yucca harrimaniae* var. *sterilis*				✓			
Stemless beardtongue	*Penstemon acaulis* var. *acaulis*		✓			✓		
Thompson's talinum	*Talinum thompsonii*				✓			
Twisted buckwheat	*Eriogonum contortum*			✓				

TABLE 3-66
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR OR WITH POTENTIAL TO OCCUR WITHIN ALTERNATIVE ROUTE STUDY CORRIDORS

Common Name	Scientific Name	Federally Listed	Bureau of Land Management Sensitive			U.S. Forest Service Sensitive		
			Wyoming	Colorado	Utah	Ashley National Forest	Manti-La Sal National Forest	Uinta National Forest
Uinta Basin spring-parsley	*Cymopterus duchesnensis*			✓				
Untermann's daisy	*Erigeron untermannii*				✓	✓		
Wheeler's angelica	*Angelica wheeleri*							✓

NOTES:
[1]Nomenclature follows (U.S. Fish and Wildlife Service [FWS] 2012b) for federally listed threatened and endangered species and (NatureServe 2012a) for all others.
[2]Nomenclature for Carrington daisy follows (Utah Native Plant Society 2012a).
[3]Nomenclature for Goodrich's columbine follows (Welsh et al. 2008).
[4]Nomenclature for hairy Townsend-daisy follows (NatureServe 2012a) for the common name, as *Townsendia strigosa* var. *prolixa* is not recognized as an official variety and (Welsh et al. 2008) provides no common name.
Federally Listed (FWS): E = Endangered; T = Threatened; C = Candidate; P = Petitioned; PT = Proposed Threatened
✓ = listed as sensitive by at least one Bureau of Land Management district or National Forest in the Project area
FWS = U.S. Fish and Wildlife Service

3.2.6.4.2 Temporal and Geographic Scope of Analysis

The geographic scope of analysis for special status plant resources is the 2-mile-wide study corridor (1 mile from the Project reference centerline in both directions) around Project alternative routes considered in the EIS. Short-term impacts are defined as those anticipated to begin during construction and dissipate in 5 years. Long-term impacts are defined as those that would begin during construction and persist through the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of transmission line (e.g., tower foundations) may be permanent.

3.2.6.4.3 Impact Assessment and Mitigation Planning

The methodology used to assess potential impacts on special status plant resources for the purpose of interdisciplinary comparison of alternative routes is presented in Section 2.5.1. In general, the analysis included (1) identifying the types of potential effects on special status plant resources that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) assessing level and extent of initial impacts on special status plant resources present in the study corridors (3) identifying appropriate selective mitigation measures for minimizing some potential adverse effects and determining specific areas where selective mitigation measures should be applied, and (4) disclosing level and extent of potential residual impacts on special status plant resources (i.e., impacts anticipated after application of selective mitigation measures). Design features incorporated in the Proposed Action to achieve environmental protection (Table 2-8) were considered when assessing both initial and residual impacts. Additional discussion of the methods used in analyzing effects of the Project on vegetation resources to support interdisciplinary comparison of alternative routes are discussed in the Effects Analysis section.

Supplemental analyses were necessary to address some of the issues raised by the public and the agencies during scoping. Quantitative or qualitative analyses were performed, depending on information available, to evaluate potential impacts of the Project on special status plant resources or to meet the requirements of relevant law, regulation, or policy. The methods for these supplemental analyses are discussed in the Effects Analysis section.

Types of Potential Effects

The construction, operation, and maintenance of the Project would result in both direct and indirect effects on special status plants, which are described in the following sections.

Federally Listed Threatened, Endangered, Proposed, Candidate Species

Direct Effects

Project activities would negatively impact special status plant habitat and populations where vegetation removal in these areas is required. Impacts on populations would persist in the long term and would most likely be irreversible. Impacts on potential habitat could be short term in duration if the area is to be revegetated; however, restoration of habitat to a predisturbance state that could support special status plants is unlikely in the short term and is not assured even in the long term. Impacts on potential habitat would be long term with construction of any new permanent Project features such as roads or facilities (i.e., towers, series compensation stations).

Additionally, soil disturbance and removal of vegetation increases the susceptibility of an area to colonization by invasive species (Hobbs and Huenneke 1992), which could directly threaten the survival of special status plant species in adjacent areas through competitive exclusion in both the short and long term.

Indirect Effects

Indirect negative impacts on special status plant populations and habitat also could occur as a result of Project-related activities. Construction in special status plant habitat could increase habitat fragmentation, which could limit gene flow between populations, decrease genetic diversity in populations, and potentially negatively impact population long-term viability (Ellstrand and Elam 1993). Clearing of vegetation during construction could also result in increased soil erosion, which could result in the deposition of soil over populations and habitat for special status plants during extreme precipitation events. Additionally, any disturbance that results in the loss of flowering plants adjacent to special status plant populations could reduce the attractiveness of an area to pollinators and subsequently limit reproductive output of individual special status plants. Increases in fire frequencies known to result from invasion of certain invasive plant species could remove special status plant populations and habitat and favor the continued dominance of invasive species in the Project area. Drift of herbicide from the treatment of noxious weeds in adjacent areas could inadvertently cause mortality of special status plants. Increased construction-related and private vehicle use on new and existing roads could result in greater dust deposition, which would inhibit photosynthetic ability, reproductive ability, and various metabolic processes of individual plants (Farmer 1993). Increased vehicle use in the Project area also could increase access to special status plant species habitat and individuals, which may increase illegal collection of commercially desirable special status plants.

Bureau of Land Management and U.S. Forest Service Sensitive Species

Short- and long-term direct and indirect effects are the same as those listed for federally listed threatened and endangered species and those proposed or candidates for listing.

Mitigation Planning and Effectiveness

Project Design Features 1, 2, 3, 5, 9, 26, 27, 28, and 30 are applicable to special status plant resources and are described in this section.

- **Design Feature 1 (minimization of vegetation clearing)**. Vegetation would be left in place wherever possible where recontouring is not required. This would minimize damage to habitats and populations of special status plant species through the minimization of vegetation disturbance in general.
- **Design Feature 2 (surface recontouring and reclamation)**. Areas subject to ground disturbance would be recontoured and revegetated as required by the land-management agency or landowner. This would generally include reseeding with a seed mix (approved by the BLM or USFS, as appropriate, or as negotiated by individual landowners) appropriate to the vegetation community in which the disturbance has occurred. Reseeding treatments on federally managed lands where sensitive plants occur or have the potential to occur would be established in coordination with the BLM and USFS, as appropriate. This design feature would minimize the temporal scope of disturbance and decrease the likelihood that a disturbance area would be colonized by invasive species, as well as providing the best opportunity for an area to return to functioning as habitat for special status species. A Reclamation, Revegetation, and Monitoring Framework Plan identifying reclamation requirements and stipulations would be developed and incorporated in the POD, which would be approved by the BLM and USFS prior to the issuance of a right-of-way grant or special-use authorization, respectively.
- **Design Feature 3 (management of special status species)**. Special status species would be considered in accordance with management policies set forth by land-management agencies. All actions that could affect federally listed plants would be subject to the conditions established during Section 7 consultation. Surveys for special status plants would be conducted prior to construction in suitable habitat (as designated by appropriate land-management agencies) along the proposed transmission line route and in vicinities of Project facilities to be constructed (e.g., access and spur roads, staging areas, etc.). Survey protocols accepted or recommended by BLM, USFS, FWS, and state agencies would be followed, as appropriate. Actions would be taken to avoid adverse impacts on special status plant populations and habitat where identified, which may include altering the placement of roads or towers, as practicable, and special reclamation measures (e.g., seed collecting for revegetation, relocation of plants out of the right-of-way). Monitoring of identified special status plant populations and habitat may also be required in cases for which this need is identified by land-management agencies. This design feature would minimize adverse impacts on special status plants through the exact identification of populations and habitats and the establishment of site-specific avoidance and monitoring objectives.
- **Design Feature 5 (establishment of a noxious weed management plan)**. A noxious weed management plan would be developed and approved by the BLM, USFS, and county weed management officer and incorporated into the POD. This plan would include specific measures to be taken to reduce the spread of noxious weeds associated with Project construction activities. Implementation of this design feature would minimize spread of noxious weed species in the Project area and the associated negative ecological effects of invasive species such as increased wildfire risk (Balch et al. 2012) and the competitive exclusion of special status plant species.
- **Design Feature 9 (avoidance of special status plants and habitat)**. Special status plants and habitat identified during preconstruction surveys would be identified during the POD development and flagged and spanned by Project structures, where feasible and within the limits of standard structure design. Where avoidance is not feasible, special status plants and their habitats would be treated in accordance with applicable law, regulation and agency policy.

Application of this design feature would allow sensitive vegetation to remain undisturbed whenever possible.

- **Design Feature 26 (vehicle access restriction)**. All construction vehicle movement would be restricted to predesignated access roads. This design feature would minimize disturbance to special status plant habitat and populations from excess overland travel and the associated potential spread of noxious weeds and increase in risk of wildfire.
- **Design Feature 27 (construction activity access restriction)**. All Project-related construction activities would be limited to a predetermined spatial extent. This design feature would minimize disturbance to special status plant habitat and populations from construction activities and the associated potential increased spread of noxious weeds and wildfire risk.
- **Design Feature 28 (personnel instruction)**. All Project personnel would be instructed in the importance, purpose, necessity, and regulations of protection of natural resources. Instruction would also be given for reporting and stop work procedures in the event of a resource conflict. This would minimize impacts on special status plant habitat and populations throughout the Project corridor, especially in habitat areas that may not have been identified prior to commencement of construction.
- **Design Feature 30 (hazardous materials restrictions)**. Hazardous materials would be contained and removed to a disposal facility and not drained into the ground, streams, or drainages. This design feature would minimize degradation to special status plant species habitat due to Project activities.

In addition, Selective Mitigation Measures 1, 2, 3, 5, 7, 12, and 15 would be implemented to reduce potential high adverse impacts on certain federally listed plant species. These measures also may be applicable to habitat and occurrences of other special status plants including BLM- and USFS- sensitive species as identified during preconstruction surveys, though specific areas to which these measures would be applied have not been identified. These design features are described and justified in this section.

- **Selective Mitigation Measure 1 (minimization of disturbance to sensitive soils and vegetation).** Existing access roads/trails would not be widened or otherwise upgraded for construction and maintenance in areas where soils and vegetation are particularly sensitive to disturbance, except in areas where repairs are necessary to make existing roads/trails passable and safe as determined by the land-management agency. This would minimize impacts on habitats for special status plant species.
- **Selective Mitigation Measure 2 (avoidance of sensitive resources)**. No blading of new access roads would occur in certain resource areas (e.g., special status plant habitats and populations) where feasible. Existing roads would be used in these areas. This mitigation measure would minimize degradation and fragmentation of special status plant species habitat.
- **Selective Mitigation Measure 3 (minimization of slope cut and fill)**. The alignment of any new access roads or cross-country routes in designated areas would follow the landform contours where practicable. This mitigation would minimize ground disturbance and potential habitat fragmentation for special status plant species.
- **Selective Mitigation Measure 5 (minimization of new or improved Project accessibility)**. All new or improved access that would not be required for maintenance would be closed or rehabilitated following Project construction using the most effective and least environmentally damaging methods. This would limit public access to special status plant populations and habitat and thereby reduce continued anthropogenic disturbance in these areas, as well as potentially mitigate any habitat losses or fragmentation due to these road features.

- **Selective Mitigation Measure 7 (spanning or avoiding of sensitive features)**. Project structures would be located to allow conductors to span or avoid identified sensitive features, such as special status plant populations and habitat. This mitigation measure would reduce overall special status plant habitat destruction and fragmentation in the Project area.
- **Selective Mitigation Measure 12 (seasonal and spatial restrictions)**. Ground-disturbing activities would occur outside of the flowering season, typically late April to mid-May, in *Sclerocactus* core habitat as defined by the FWS. This would avoid adverse impacts on *Sclerocactus* reproductive success related to fugitive dust and pollinator disturbance.
- **Selective Mitigation Measure 15 (limiting accessibility in sensitive habitats).** Where feasible, access roads that traverse sensitive habitats (e.g., crucial winter range) would be gated or otherwise blocked to limit public access. This would minimize impacts on habitats for special status plant species.

Conservation measures to address direct and indirect effects on special status plant species would be incorporated into the Plant and Wildlife Species Conservation Measures Plan to be developed for the POD. The purpose of this plan will be to assist the BLM, USFS, and applicant personnel in meeting their obligations to protect biological resources during construction, operation, and maintenance of the Project. All relevant BLM requirements (including monitoring) will be included in this plan, and compliance of the Project with stipulations in this plan will be required.

Effects Analysis

Methods for Analysis to Support Interdisciplinary Comparison of Alternative Routes

Criteria for Assessing Intensity of Impacts

Criteria were developed in collaboration with the Agency Interdisciplinary Team to assess the level of a potential effect on federally listed or candidate plants associated with implementation of the Project and to compare the impacts between alternative routes (Table 3-67). Impact criteria were based on considerations of relative abundance of populations, magnitude of anticipated impacts, additional protections (including laws and statutes), and existing conditions.

TABLE 3-67
CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON FEDERALLY LISTED OR CANDIDATE PLANTS

Level of Impacts	Description
High	▪ Impacts that would severely limit the long-term sustainability of populations (e.g., impacts on only known population) ▪ Loss or adverse modification of occupied habitat or large portions of suitable habitat for local species ▪ Loss or adverse modification of designated critical habitat
Moderate	▪ Impacts that would have adverse effects on species but would not severely limit the long-term sustainability of populations (e.g., impacts on plant populations somewhat more widely distributed than local species) ▪ Loss or adverse modification of small portions of unoccupied suitable habitat for local species
Low	▪ Impacts that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (e.g., indirect effects or impacts in areas of pre-existing disturbance) ▪ Indirect effects or disturbance in areas of pre-existing disturbance

Initial Impacts

The level of a potential effect on special status plants (i.e., a particular species or habitat type) that could result from implementation of the Project is used as the basis for assessing initial impacts. All suitable habitat is considered occupied for the purpose of assessing level of impacts on species. Design features of the Proposed Action would reduce impacts on special status plants and were considered when assessing potential impacts on specific resources. Based on the level of a potential effect on a special status plant, initial impacts were assigned (Table 3-68) using the criteria presented in Table 3-67.

Residual Impacts

Selective mitigation measures would be applied to reduce the level of impacts associated with Project construction and maintenance. Residual impacts are impacts on resources that are anticipated to occur from Project activities after the application of selective mitigation measures described in the *Mitigation Planning and Effectiveness* section. The level of anticipated residual impacts on special status plant resources associated with implementation of the Project was assessed using the criteria presented in Table 3-67. Application of selective mitigation measures is expected to reduce the level of potential impacts on all federally listed plant species (e.g., those with an initial impact rating of moderate would have a residual impact rating of low after application of selective mitigation measures). A summary of anticipated initial and residual impacts on special status plant resources, as well as the selective mitigation measures applied, are presented in Table 3-68.

The level of residual impacts are quantified and reported as a function of miles crossed of known or potential habitat for each federally listed or candidate plant species.

TABLE 3-68
SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON SPECIAL STATUS PLANTS

Common Name	Design Features	Initial Impacts	Selective Mitigation Measure Applied	Residual Impact
Endangered				
Barneby ridge-cress	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 7	Moderate
Clay phacelia	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 3, 7	Moderate
San Rafael cactus	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 5, 7	Low
Shrubby reed-mustard	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 7	Low
Threatened				
Deseret milkvetch	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 7	Moderate
Jones' cycladenia	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 5, 7	Moderate
Pariette cactus	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 5, 7, 12	Moderate
Uinta Basin hookless cactus	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 5, 7, 12	Low
Clay reed-mustard	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 7	Moderate
Ute ladies'-tresses	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 7	Low

TABLE 3-68 SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON SPECIAL STATUS PLANTS				
Common Name	**Design Features**	**Initial Impacts**	**Selective Mitigation Measure Applied**	**Residual Impact**
Candidate				
White River beardtongue	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 7	Low
Petitioned				
Cisco milkvetch	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 7	Moderate
Proposed Threatened				
Graham's beardtongue	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 7	Low
Core Habitat Areas				
Level 1 *Sclerocactus* core habitat (high density occupied habitat)	1, 2, 3, 5, 9, 26, 27, 28, 30	High	2, 5, 7, 12	Moderate
Level 2 *Sclerocactus* core habitat (low density occupied habitat)	1, 2, 3, 5, 9, 26, 27, 28, 30	Moderate	2, 5, 7, 12	Low

Federally Listed Endangered Species

Barneby Ridge-cress

The Barneby ridge-cress is found on poorly developed soils derived from Marly Shale outcrops in a zone of interbedding geologic strata from the Uinta and Green River formations. As this type of soil is rare in the Uinta Basin, only small islands of suitable habitat are available. Only one population of approximately 5,000 individuals of Barneby ridge-cress is currently known. The primary threat to the survival of Barneby ridge-cress is damage due to oil and gas exploration, but trampling from unrestricted off-road vehicle use and livestock also threaten the survival of the species (FWS 1993). Impacts on Barneby ridge-cress habitat or populations could limit this species' long-term viability due to its small population size and available range of habitat, and therefore the level of initial impacts of the Project on this species was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate as it is likely that the majority of habitat and plants could be avoided by tower sites and roads. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

Clay Phacelia

Approximately 200 clay phacelia individuals are known from small populations in Spanish Fork Canyon in Utah (FWS 1982). Clay phacelia grows on very steep slopes (up to 70 percent grade) in sparsely populated pinyon-juniper and mountain brush communities (Welsh et al. 1975). Modeled potential habitat for this species occurs on slopes of up to 86 percent (USFS 2013b). The substrate of clay phacelia habitat is shaley clay colluviums of the Green River Formation, which continually slough down slope faces (Atwood 1975). The primary threat to the survival of clay phacelia is the vulnerability resulting from such a small population size, a high degree of habitat specificity, and from the high erodibility of the substrate of its habitat. Impacts on clay phacelia habitat or populations could limit this species' long-term viability due to its small population size and fragile habitat, and therefore the level of initial impacts of the Project on this species was determined to be high. Following application of selective mitigation measures aimed

at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate as tower sites and roads are not likely to directly affect known populations and reintroduction sites. Additionally, any disturbance within habitat will follow mitigation measures outlined by the FWS and USFS. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

San Rafael Cactus

Three known populations of the San Rafael cactus with an estimated total population of 20,000 individuals were known in 1995. San Rafael cactus individuals lose turgidity and withdraw to below the soil surface during portions of the year where soil moisture is low, which provides some natural protection from trampling. However, the species forms flower buds at ground level that remain vulnerable to surface disturbance (FWS 1995a). Due to this species' relatively large population size, impacts on San Rafael cactus habitat or individuals are not likely to limit the species' long-term viability. Therefore, the level of initial impacts of the Project on this species was determined to be moderate. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be low as it is likely that the majority of habitat and plants could be avoided by tower sites and roads due to the high degree of physical separation between individuals of this species. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

Shrubby Reed-mustard

The shrubby reed-mustard is confined to localized geological formations of buff-colored calcareous shale of the Green River Formation in the Uinta Basin of eastern Utah (FWS 1994a). Approximately 2,900 individuals are currently known from seven populations (FWS 2010c). Primary threats to survival of the shrubby reed-mustard are the vulnerability resulting from a small population size and exposure to various forms of disturbance, such as those associated with the oil and gas industry and off-road vehicle use (FWS 1994a). Due to this species' small population size but relatively widespread habitat range, impacts on shrubby reed-mustard habitat or populations are not likely to limit the species' long-term viability. Therefore, the level of initial impacts of the Project on this species was determined to be moderate. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be low as it is likely that the majority of habitat and plants could be avoided by tower sites and roads due to the high degree of physical separation between individuals and populations of this species. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

Federally Listed Threatened Species

Clay Reed-mustard

The clay reed-mustard occurs in six distinct populations in western Uintah County, Utah. Most sites of clay reed-mustard contain fewer than 200 individuals. Small population sizes and decreased genetic diversity increase the sensitivity of this species to disturbance (FWS 2011c). Due to this species' small population size, impacts on clay reed-mustard habitat or populations could limit this species' long-term viability. Therefore, the level of initial impacts of the Project on clay reed-mustard was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to

be moderate as it is likely that the majority of habitat and plants could be avoided by tower sites and roads due to the high degree of physical separation between individuals and populations of this species. Additionally, steep slopes favored by this species are not generally suitable for construction of permanent features. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

Deseret Milkvetch

The Deseret milkvetch is endemic to central Utah and known from only one location on the east side of the Thistle Creek Valley near the town of Birdseye in Utah County (UDWR 2005). The population consists of an estimated 86,775 to 98,818 individuals growing on 146 acres on both state and privately owned land (FWS 2011d). The single known population is in an open to sparse juniper-sagebrush community on steep, naturally disturbed south and west (rarely north) facing slopes with sandy-gravelly soils adjacent to a dirt road (FWS 2011d; UDWR 2005). No threats to the survival of the Deseret milkvetch were believed to exist at the time of the Deseret milkvetch 5-year status review (FWS 2011d); however, widening of a dirt access road on UDWR property adjacent to known habitat, if required for Project construction or maintenance, could negatively impact this species. However, the limited population size makes the species more susceptible to extirpation and the consequences of limited genetic diversity; specifically, decreased ability to adapt to changing conditions (Ellstrand and Elam 1993). Due to its restricted habitat, impacts on Deseret milkvetch habitat or populations could limit this species' long-term viability. Therefore, the level of initial impacts of the Project on Deseret milkvetch was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate as no direct disturbance of habitat and plants would be required for the construction of tower sites and roads. However, indirect disturbance could occur from increased vehicle use and dust deposition from traffic associated with Project construction and operation. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

Jones' Cycladenia

Jones' cycladenia is found only on gypsiferous, saline soils of Cutler, Summerville, and Chinle Formations (FWS 2008a). This species exhibits low fruit production and seed set, likely due to a complicated pollination system and inadequate pollinator abundance; in addition, no seedling germination events have been documented (FWS 2008a). At the time of listing, populations of Jones' cycladenia individuals were only known from three sites. Ongoing and potential anthropogenic impacts on habitat include off-highway vehicle (OHV) use, oil, gas, and mineral exploration including uranium mining and tar sands, and livestock grazing (51 FR 16526-16530). In combination with this species' small population size, these factors make the long-term viability of Jones cycladenia vulnerable to impacts on populations or habitat. Therefore, the level of initial impacts of the Project on this species was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate, as no known populations are within study corridors and it is likely that the majority of habitat and plants could be avoided by tower sites and roads. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

Pariette Cactus

The Pariette cactus grows on fine soils in clay bad lands derived from the Uinta formation and inhabits a low hilly terrain overlain with gravel and stone (UDWR 2005). The entire population of Pariette cactus, which consists of about 8,000 individuals, is known from a 30-square-mile area around the Pariette Draw. The primary threats to the survival of the Pariette cactus complex are posed by loss of plants and habitat as a result of mineral and energy development, water development, and collection. Another threat is hybridization with the more widespread Uinta Basin hookless cactus, which results in a dilution of this species' genetic material (Flora of North America Editorial Committee 1993). Impacts on Pariette cactus habitat or populations could severely limit this species' long-term viability due to its small population size and restricted habitat, and therefore the level of initial impacts of the Project on this species was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate as no known populations are within study corridors. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species Table 3-67).

Uinta Basin Hookless Cactus

Current population estimates of the Uinta Basin hookless cactus are at about 30,000 individuals over a range approximately 60 miles long and 25 miles wide. The Uinta Basin hookless cactus population in the vicinity of the proposed project is geographically separated from the remainder of the species range (current separation between this population and the nearest individual from the main part of the species range is 5.4 miles). Additionally, the individuals of this population have been found to have distinctive morphological characteristics including a greater width-to-height ratio than found in other members of *S. wetlandicus*, a flattened apex (D. Woodruff, unpublished data in Tepedino et al. 2010), and were found to differ in their reproductive biology from other members of the species in being self-compatible (Tepedino et al. 2010). The primary threats to the survival of the Uinta Basin hookless cactus are posed by loss of plants and habitat as a result of mineral and energy development, water development, and illegal collection (BLM 2008b; FWS 1990). Due to its relatively large population size and habitat range, impacts on Uinta Basin hookless cactus habitat or populations could have an adverse effect on this species but not severely limit its long-term viability. Therefore, the level of initial impacts of the Project on Uinta Basin hookless cactus was determined to be moderate. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be low as surface disturbance timing stipulations would be followed and it is likely that the vast majority of known and suitable habitat and individuals would be unaffected by construction of the Project. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

Ute Ladies'-tresses

The range of Ute ladies'-tresses extends over a large geographic area that includes the Uinta Basin, the base of the eastern slope of the Rocky Mountains, and the base of the western slope of the Wasatch Mountains. Populations are generally small and occur in scattered groups in riparian areas (FWS 1995b). Primary threats to Ute ladies'-tresses are overgrazing and noxious weed invasion of stream bank and riparian areas (57 FR 2048;(FWS 1995b). Due to this species' relatively large range, impacts on Ute ladies'-tresses habitat or populations could have an adverse effect on this species but not severely limit its long-term viability. Therefore, the level of initial impacts of the Project on Ute ladies'-tresses was determined to be moderate. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this

species was determined to be low as it is likely that the majority of habitat and plants could be avoided by tower sites and roads, as the Project would avoid disturbance to all riparian areas to the extent practicable. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

Proposed Threatened Species

Graham's Beardtongue

Graham's beardtongue is limited to the Uinta Basin in known occurrences in Carbon, Duchesne, and Uintah counties in Utah and Rio Blanco County in Colorado (Utah Native Plant Society 2012b). The current population estimates for this species is 31,702 individuals across five populations (78 FR 47592). Threats include increased energy development, livestock grazing, and climate change (78 FR 47590). The level of initial impacts of the Project on Graham's beardtongue was determined to be moderate based on this species' small population size and the potential for impacts on have adverse effects on species but not severely limit the long-term sustainability of populations. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be low as it is likely that the majority of habitat and plants could be avoided by tower sites and roads. Though potential habitat for this species is crossed, proposed critical habitat would not occur in proximity to study corridors and it is likely that any populations encountered during pre-construction surveying could be avoided. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

White River Beardtongue

Known populations of the White River beardtongue are limited to a 20-mile arc that extends from Raven Ridge west of Rangely in Rio Blanco County, Colorado, to the vicinity of Willow Creek in Uintah County (78 FR 47595). The best total population estimate is approximately 11,423 individuals (78 FR 47596). White River beardtongue is vulnerable to habitat destruction as a consequence of energy development, livestock grazing, and climate change (78 FR 47597–47606). Due to this species' relatively large population size, impacts on White River beardtongue habitat or populations could have an adverse effect on this species but not severely limit its long-term viability. Therefore, the level of initial impacts of the Project on White River beardtongue was determined to be moderate. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be low as it is likely that the majority of habitat and plants could be avoided by tower sites and roads. Though potential habitat for this species is crossed, proposed critical habitat would not occur in proximity to study corridors and it is likely that any populations encountered during pre-construction surveying could be avoided. Low-level impacts are those that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (Table 3-67).

Species Petitioned for Federal Listing

Cisco Milkvetch

The Cisco milkvetch only occurs on the Mancos Shale Formation in salt desert shrub communities from 4,250 to 5,250 feet in the 20 miles between Cisco Mesa and Whipsaw Flat (Franklin 2005; Utah Native Plan Society 2012b). Impacts on Cisco milkvetch habitat or populations could limit this species' long-term viability due to its restricted habitat, and therefore the level of initial impacts of the Project on this species was determined to be high. Following application of selective mitigation measures aimed at avoiding and spanning populations and habitat of special status plant species, the level of residual impacts on this species was determined to be moderate as it is likely that the majority of habitat and plants could

be avoided by tower sites and roads. Moderate-level impacts are those that would have adverse effects on species but would not severely limit the long-term sustainability of populations, or those that would result in loss or adverse modification of small portions of unoccupied suitable habitat for local species (Table 3-67).

Other Considerations

Sclerocactus Core Habitat

Core conservation areas have been established by the FWS to provide management guidance for habitat for both Uinta Basin hookless cactus and Pariette cactus (heretofore referred to as *Sclerocactus* core habitat), as no clear geographic delineation between the ranges and habitat requirements of these species exists (FWS n.d.). Level 1 core habitat includes high-density occupied *Sclerocactus* habitat and a 400-meter buffer around plants. Level 2 core habitat includes less-densely occupied *Sclerocactus* habitat and a 1,000-meter buffer around plants. Both buffer distances allow for pollinator travel between cactus locations (FWS n.d.). Polygons for these core habitat areas will be regarded as occupied *Sclerocactus* habitat for the purposes of this analysis and impacts on these areas are reported separately. Impacts on Uinta Basin hookless cactus and Pariette cactus potential habitat, defined as areas in which the FWS requires surveys for these species to be conducted in advance of any project construction, is also analyzed and reported.

Methods for Additional Analysis of Potential Impacts

In addition to the analysis conducted to allow interdisciplinary comparison of alternative routes, additional analyses were required to adequately address some issues raised by the public and the agencies during scoping regarding potential impacts on special status plant resources or to meet the requirements of relevant law, regulation, or policy.

The total loss of special status plant habitat (in acres) due to Project features was estimated to provide an overview of potential impacts on special status plant resources. The analysis was completed by estimating the disturbance due to construction of features such as roads, transmission line tower, and other Project facilities and divided by the total length (in miles) of the alternative to calculate the average rate of disturbance per mile. This rate was then used to estimate the extent of loss of special status plant habitat (in acres) that would occur with each specific length of habitat crossed by an alternative route.

As the rate of special status plant disturbance per mile varies by alternative and by route variation, the same length of special status plant habitat crossed by different alternative routes or route variations could have fluctuations in disturbance to a habitat.

Element occurrence data from state natural heritage programs, population points and occupied habitat polygons from the BLM, and modeled habitat from the Wyoming Natural Diversity Database (WYNDD) were used to determine the presence of or potential for federally listed and BLM- and USFS-listed sensitive species in the 2-mile buffer (1 mile on each side) of Project alternative route centerlines. Numbers of Element Occurrences, population points, or occupied habitat polygons (hereafter occurrences) in these areas are reported by alternative route. Multiple population points reported in the same immediate area (from a single or multiple sources) were considered a single occurrence for the purpose of this analysis, and therefore numbers of occurrences in these results may not exactly match agency-supplied population data. Number of occurrences for each species will be reported for each Project alternative route in each state. Occurrences of all BLM- or USFS-listed sensitive plants will be reported regardless of land jurisdiction on which they occur (i.e., Colorado BLM-listed sensitive species may be reported within Utah). Total populations or numbers of individuals are not reported, as these data often are not recorded consistently between observers, states, or agencies.

3.2.6.5 Results

Disturbance to special status plant species habitat and populations would occur with all action alternative routes. Surveys for special status plants would be conducted along the selected alternative route following BLM, USFS, and/or FWS guidance and protocols. Selective Mitigation Measures 1, 2, 3, 5, 7, 12, and 15 would be applied to reduce impacts where special status plants and habitat are detected. These measures and others also may be applicable to habitat and occurrences of other special status plants including BLM and USFS sensitive species as identified during preconstruction surveys, though these specific areas to which these measures would be applied have not been identified. It is anticipated that not all special status plant populations, individuals, and habitat would be able to be avoided. Areas of highest resource value, as determined by and approved by the agencies would be given the highest priority for avoidance. All actions that could affect federally listed plants would be subject to the conditions established during Section 7 consultation. Sufficient data are not available at this time to determine if all habitat and plants could be avoided. Where avoidance is not possible, impacts could include permanent loss of habitat or populations of special status plant species. In some cases, permanent loss of habitat or populations of special status plants could result in loss of federally listed plants and negative impacts on habitat for these species.

3.2.6.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.6.5.2 Impacts Common to All Action Alternatives

There are no impacts common to all action alternative routes for special status plant resources.

3.2.6.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary transmission line components would be located in an area between the Mona and Clover substations west of the town of Mona, Utah. Most of the 345kV ancillary transmission line components would be within an existing right-of-way. No habitat for special status species would be crossed by 345kV Transmission Line components. No occurrences of special status species are within 1 mile of these components.

3.2.6.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Environmental Setting

The WYCO route grouping is from Aeolus, Wyoming to U.S. Highway 40 in Colorado (Map 2-2a). The majority of this route grouping is in the Wyoming Basin Ecoregion, The Colorado Plateaus Ecoregion is crossed as the routes proceed southwest of the area around Maybell, Colorado (refer to Section 3.2.5.3 for ecoregion descriptions).

Habitat for Barneby ridge-cress, Cisco milkvetch, clay phacelia, clay reed-mustard, Deseret milkvetch, Graham's beardtongue, Jones' cycladenia, Pariette cactus, San Rafael cactus, shrubby reed-mustard, Uinta Basin hookless cactus, and White River beardtongue is not known to occur in the areas crossed by the WYCO routes and would not be affected by any of the WYCO routes. Additionally, no occurrences of these species are located within 1 mile of any WYCO alternative routes.

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B in Wyoming predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

Alternative WYCO-B in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69) in four different areas, all in Carbon County: (1) the floodplain of Medicine Bow River, (2) wetlands in Hanna Draw, (3) the floodplain of North Platte River, and (4) wetlands in Hay Gulch.

No documented occurrences of federally listed plant species are within 1 mile of the centerline of Alternative WYCO-B in Wyoming.

Potential habitat for the BLM-listed sensitive species Gibbens' beardtongue and persistent-sepal yellowcress occur within 1 mile of the centerline of Alternative WYCO-B in Wyoming. This alternative route also crosses WYNDD-modeled habitat for meadow pussytoes and Beaver Rim phlox. WYNDD-modeled habitat for Cedar Rim thistle also occurs within 1 mile of this alternative route. A single occurrence of persistent-sepal yellowcress is within 1 mile of the centerline of this alternative route in Wyoming.

TABLE 3-69
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES INVENTORY DATA FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Routes	Total Miles	Ute Ladies'-tresses Potential Habitat (miles crossed)
Alternative WYCO-B and Route Variations		
WYCO-B (Applicant Preferred Alternative)	204.5	0.2
Wyoming	*138.1*	*0.2*
Colorado	*66.4*	*0.0*
WYCO-B-1	204.9	0.2
Wyoming	*138.1*	*0.2*
Colorado	*66.8*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	0.2
Wyoming	*138.1*	*0.2*
Colorado	*66.4*	*0.0*
WYCO-B-3	204.5	0.2
Wyoming	*138.1*	*0.2*
Colorado	*66.4*	*0.0*
Alternative WYCO-C and Route Variations		
WYCO-C	210.4	0.2
Wyoming	*144.0*	*0.2*
Colorado	*66.4*	*0.0*
WYCO-C-1	210.8	0.2
Wyoming	*144.0*	*0.2*
Colorado	*66.8*	*0.0*
WYCO-C-2	210.4	0.2
Wyoming	*144.0*	*0.2*
Colorado	*66.4*	*0.0*
WYCO-C-3	210.4	0.2
Wyoming	*144.0*	*0.2*
Colorado	*66.4*	*0.0*

TABLE 3-69 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES INVENTORY DATA FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES		
Alternative Routes	**Total Miles**	**Ute Ladies'-tresses Potential Habitat (miles crossed)**
Alternative WYCO-D and Route Variations		
WYCO-D *Wyoming* *Colorado*	250.0 *135.0* *115.0*	1.5 *0.5* *1.0*
WYCO-D-1 *Wyoming* *Colorado*	250.0 *135.0* *115.0*	1.5 *0.5* *1.0*
Alternative WYCO-F and Route Variations		
WYCO-F *Wyoming* *Colorado*	218.9 *152.5* *66.4*	0.5 *0.5* *0.0*
WYCO-F-1 *Wyoming* *Colorado*	219.3 *152.5* *66.8*	0.5 *0.5* *0.0*
WYCO-F-2 *Wyoming* *Colorado*	218.9 *152.5* *66.4*	0.5 *0.5* *0.0*
WYCO-F-3 *Wyoming* *Colorado*	218.9 *152.5* *66.4*	0.5 *0.5* *0.0*

Environmental Consequences (Wyoming)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative WYCO-B in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69). Residual impacts on Ute ladies'-tresses would be low (Table 3-70), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

TABLE 3-70 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES			
Alternative Route	**Residual Impacts (miles crossed)**		
	Low	**Moderate**	**High**
Alternative WYCO-B and Route Variations			
WYCO-B (Applicant Preferred Alternative) *Wyoming* *Colorado*	0.2 *0.2* *0.0*	0.0 *0.0* *0.0*	0.0 *0.0* *0.0*
WYCO-B-1 *Wyoming* *Colorado*	0.2 *0.2* *0.0*	0.0 *0.0* *0.0*	0.0 *0.0* *0.0*
WYCO-B-2 (Agency Preferred Alternative) *Wyoming* *Colorado*	0.2 *0.2* *0.0*	0.0 *0.0* *0.0*	0.0 *0.0* *0.0*

TABLE 3-70 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES			
	Residual Impacts (miles crossed)		
Alternative Route	**Low**	**Moderate**	**High**
WYCO-B-3	0.2	0.0	0.0
Wyoming	*0.2*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
Alternative WYCO-C and Route Variations			
WYCO-C	0.2	0.0	0.0
Wyoming	*0.2*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-C-1	0.2	0.0	0.0
Wyoming	*0.2*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-C-2	0.2	0.0	0.0
Wyoming	*0.2*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-C-3	0.2	0.0	0.0
Wyoming	*0.2*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
Alternative WYCO-D and Route Variation			
WYCO-D	1.5	0.0	0.0
Wyoming	*0.5*	*0.0*	*0.0*
Colorado	*1.0*	*0.0*	*0.0*
WYCO-D-1	1.5	0.0	0.0
Wyoming	*0.5*	*0.0*	*0.0*
Colorado	*1.0*	*0.0*	*0.0*
Alternative WYCO-F and Route Variations			
WYCO-F	0.5	0.0	0.0
Wyoming	*0.5*	0.0	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-F-1	0.5	0.0	0.0
Wyoming	*0.5*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-F-2	0.5	0.0	0.0
Wyoming	*0.5*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*
WYCO-F-3	0.5	0.0	0.0
Wyoming	*0.5*	*0.0*	*0.0*
Colorado	*0.0*	*0.0*	*0.0*

Results of Additional Analysis of Potential Impacts

The estimated area of Ute ladies'-tresses potential habitat that may be affected by Alternative WYCO-B in Wyoming is presented in Table 3-71.

TABLE 3-71 ESTIMATED EXTENT (IN ACRES) OF SPECIAL STATUS PLANT SPECIES POTENTIAL HABITAT AFFECTED FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES	
Alternative Route	**Ute Ladies'-tresses**
Alternative WYCO-B and Route Variations	
WYCO-B (Applicant Preferred Alternative) *Wyoming* *Colorado*	3 *3* *0*
WYCO-B-1 *Wyoming* *Colorado*	3 *3* *0*
WYCO-B-2 (Agency Preferred Alternative) *Wyoming* *Colorado*	3 *3* *0*
WYCO-B-3 *Wyoming* *Colorado*	3 *3* *0*
Alternative WYCO-C and Route Variations	
WYCO-C *Wyoming* *Colorado*	3 *3* *0*
WYCO-C-1 *Wyoming* *Colorado*	3 *3* *0*
WYCO-C-2 *Wyoming* *Colorado*	3 *3* *0*
WYCO-C-3 *Wyoming* *Colorado*	3 *3* *0*
Alternative WYCO-D and Route Variation	
WYCO-D *Wyoming* *Colorado*	24 *8* *16*
WYCO-D-1 *Wyoming* *Colorado*	24 *8* *16*
Alternative WYCO-F and Route Variations	
WYCO-F *Wyoming* *Colorado*	8 *8* *0*
WYCO-F-1 *Wyoming* *Colorado*	8 *8* *0*
WYCO-F-2 *Wyoming* *Colorado*	8 *8* *0*
WYCO-F-3 *Wyoming* *Colorado*	8 *8* *0*

Information is not comprehensive regarding the locations of Project activities in relation to potential habitat for Gibbens' beardtongue and persistent-sepal yellowcress and the specific occurrence of

persistent sepal-yellowcress; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or the extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Based on data available for analysis, impacts of Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming on occurrences or habitat of special status plants would be the same as those of WYCO-B in Wyoming.

Affected Environment (Colorado)

Alternative WYCO-B in Colorado predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

No known or potential habitat for federally listed plant species is crossed by this alternative route in Colorado (Table 3-69). No documented occurrences of federally listed plant species are within 1 mile of the centerline of this alternative route in Colorado.

One occurrence of caespitose cat's-eye, three occurrences of debris milkvetch, one occurrence of stemless beardtongue, and one occurrence of Ownbey's thistle, all BLM-listed sensitive species, are within 1 mile of the centerline of Alternative WYCO-B in Colorado.

Environmental Consequences (Colorado)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

No known or potential habitat for federally listed plant species is crossed by Alternative WYCO-B in Colorado (Table 3-69) and therefore no residual impacts on special status plant species were identified (Table 3-70).

Results of Additional Analysis of Potential Impacts

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Based on data available for analysis, impacts of Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 on occurrences or habitat of special status plants would be the same as those of WYCO-B.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C in Wyoming predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

Alternative WYCO-C in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69) in four different areas, all in Carbon County: (1) the floodplain of Medicine Bow River, (2) wetlands in Hanna Draw, (3) the floodplain of North Platte River, and (4) wetlands in Hay Gulch.

No documented occurrences of federally listed plant species are within 1 mile of the centerline of this alternative route in Wyoming.

Potential habitat for Gibbens' beardtongue and persistent-sepal yellowcress, both BLM-listed sensitive species, occurs within 1 mile of the centerline of Alternative WYCO-C in Wyoming. Several occurrence of Gibbens' beardtongue are crossed within 1 mile of the centerline of Alternative WYCO-C in Wyoming. One occurrence of persistent-sepal yellowcress is within 1 mile of the centerline of Alternative WYCO-C in Wyoming. This alternative route also crosses WYNDD-modeled habitat for meadow pussytoes, Beaver Rim phlox, racemose milkvetch, stemless beardtongue, dense twinpod, and Cedar Rim thistle. WYNDD-modeled habitat for Cedar Rim thistle and large-footed bladderpod also occurs within 1 mile of this alternative route.

Environmental Consequences (Wyoming)

Alternative WYCO-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

This alternative route crosses Ute ladies'-tresses potential habitat (Table 3-69). Residual impacts on Ute ladies'-tresses would be low (Table 3-70), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Ute ladies'-tresses potential habitat that may be affected by Alternative WYCO-C in Wyoming is presented in Table 3-71.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Based on data available for analysis, impacts of Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming on occurrences or habitat of special status plants would be the same as those of WYCO-C in Wyoming.

Affected Environment (Colorado)

Alternative WYCO-C in Colorado predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

No known or potential habitat for federally listed plant species is crossed by Alternative WYCO-C in Colorado (Table 3-69). No documented occurrences of federally listed plant species are within 1 mile of the centerline of Alternative WYCO-C in Colorado.

One occurrence of caespitose cat's-eye, three occurrences of debris milkvetch, one occurrence of stemless beardtongue, and one occurrence of Ownbey's thistle, all BLM-listed sensitive species, are within 1 mile of the centerline of Alternative WYCO-C in Colorado.

Environmental Consequences (Colorado)

Alternative WYCO-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

No known or potential habitat for federally listed plant species is crossed by Alternative WYCO-C in Colorado (Table 3-69) and therefore no residual impacts on special status plant species would occur (Table 3-70).

Results of Additional Analysis of Potential Impacts

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Based on data available for analysis, impacts of Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Colorado on occurrences or habitat of special status plants would be the same as those of WYCO-C in Colorado.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D in Wyoming predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

Alternative WYCO-D in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69) in five areas, all in Carbon County:

- the floodplain of Medicine Bow River
- near a series of springs to the north of Hi Allen Ridge
- the floodplain of the North Platte River
- Hay Gulch
- the floodplain of Muddy Creek

No documented occurrences of federally listed plant species are within 1 mile of the centerline of this alternative route in Wyoming.

Potential habitat for Gibbens' beardtongue also occurs 1 mile of the centerline of Alternative WYCO-D in Wyoming. A single occurrence of persistent-sepal yellowcress, a BLM-listed sensitive species, is within 1 mile of the centerline of Alternative WYCO-D in Wyoming. This alternative route also crosses WYNDD-modeled habitat for meadow pussytoes and Beaver Rim phlox. WYNDD-modeled habitat for Cedar Rim thistle also occurs within 1 mile of this alternative route.

Environmental Consequences (Wyoming)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

This alternative route in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69). Residual impacts on Ute ladies'-tresses would be low (Table 3-70), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Ute ladies'-tresses potential habitat that may be affected by construction of roads and transmission line towers with Alternative WYCO-D in Wyoming is presented in Table 3-71.

Information is not comprehensive regarding the locations of Project activities in relation to potential habitat for Biggens' beardtongue and the occurrence of persistent-sepal yellowcress; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-D Route Variation (WYCO-D-1)

Based on data available for analysis, impacts of Route Variation WYCO-D-1 in Wyoming on occurrences or habitat of special status plants would be the same as those of Alternative WYCO-D in Wyoming.

Affected Environment (Colorado)

Alternative WYCO-D in Colorado predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

Alternative WYCO-D in Colorado crosses Ute ladies'-tresses potential habitat (Table 3-69) in four areas, all in Moffat County:

- the floodplain of the Little Snake River
- the area around Fortification Creek
- the floodplain of Cottonwood Creek, a smaller tributary of Fortification Creek
- the floodplain of the Yampa River

No documented occurrences of federally listed plant species are located within 1 mile of the centerline of Alternative WYCO-D in Colorado.

One occurrence of caespitose cat's-eye, three occurrences of debris milkvetch, one occurrence of stemless beardtongue, and one occurrence of Ownbey's thistle, all BLM-listed sensitive species, are within 1 mile of the centerline of Alternative WYCO-D in Colorado.

Environmental Consequences (Colorado)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

This alternative route in Colorado crosses Ute ladies'-tresses potential habitat (Table 3-69). Residual impacts on Ute ladies'-tresses would be low (Table 3-70), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Ute ladies'-tresses potential habitat that may be affected by construction of roads and transmission line towers with Alternative WYCO-D in Colorado is presented in Table 3-71.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-D Route Variation (WYCO-D-1)

Based on data available for analysis, impacts of Route Variation WYCO-D-1 in Colorado on occurrences or habitat of special status plants would be the same as those of Alternative WYCO-D in Colorado.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F in Wyoming predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

Alternative WYCO-F in Wyoming crosses Ute ladies'-tresses potential habitat (Table 3-69) in seven areas:

- the floodplain of Medicine Bow River
- wetlands in the Mexican Flats area
- a series of wetlands in the Robber's Gulch area
- the floodplain of Cottonwood Creek, a tributary of Muddy Creek
- wetlands in Hanna Draw
- the floodplain of North Platte River
- wetlands in Hay Gulch

No documented occurrences of federally listed plant species are within 1 mile of the centerline of Alternative WYCO-F in Wyoming.

Potential habitat for Gibbens' beardtongue and persistent-sepal yellowcress, both BLM-listed sensitive species, occurs within 1 mile of the centerline of Alternative WYCO-F in Wyoming. Several occurrences of Gibbens' beardtongue are crossed by or within 1 mile of the centerline of Alternative WYCO-F in Wyoming. One occurrence of persistent-sepal yellowcress is within 1 mile of the centerline of Alternative WYCO-F in Wyoming. This alternative route also crosses WYNDD-modeled habitat for meadow pussytoes and Beaver Rim phlox. WYNDD-modeled habitat for Ownbey's thistle also occurs within 1 mile of this alternative route.

Environmental Consequences (Wyoming)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

This alternative route crosses Ute ladies'-tresses potential habitat Table 3-69). Residual impacts on Ute ladies'-tresses would be low (Table 3-70), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Ute ladies'-tresses potential habitat that may be affected by construction of roads and transmission line towers with Alternative WYCO-F in Wyoming is presented in Table 3-71.

Information is not comprehensive regarding the locations of Project activities in relation to occurrences and potential habitat of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Based on data available for analysis, impacts of Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming on occurrences or habitat of special status plants would be the same as those of WYCO-F in Wyoming.

Affected Environment (Colorado)

Alternative WYCO-F in Colorado predominantly crosses big sagebrush and shrub/shrub steppe vegetation communities (Table 3-53).

No known or potential habitat for federally listed plant species is crossed by Alternative WYCO-F in Colorado (Table 3-69). No documented occurrences of federally listed plant species are within 1 mile of the centerline of Alternative WYCO-F in Colorado.

One occurrence of caespitose cat's-eye, three occurrences of debris milkvetch, one occurrence of stemless beardtongue, and one occurrence of Ownbey's thistle, all BLM-listed sensitive species, are within 1 mile of the centerline of Alternative WYCO-F in Colorado.

Environmental Consequences (Colorado)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

No known or potential habitat for federally listed plant species is crossed by Alternative WYCO-F in Colorado (Table 3-69) and therefore no impacts on special status plant species would occur (Table 3-70).

Results of Additional Analysis of Potential Impacts

Information is not comprehensive regarding the locations of Project activities in relation to occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Based on data available for analysis, impacts of Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado on occurrences or habitat of special status plants would be the same as those of WYCO-F in Colorado.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

The COUT BAX route grouping is from U.S. Highway 40 in Colorado to Clover, Utah by way of Baxter Pass. This route grouping travels south of the Uintah and Ouray Indian Reservation and passes through Green River, Utah (Map 2-1b). This grouping is predominantly in the Colorado Plateaus Ecoregion but crosses into the Wasatch and Uinta Mountains and Central Basin and Range ecoregions as it approaches Mona, Utah (refer to Section 3.2.5.3 for ecoregion descriptions).

Habitat for Barneby ridge-cress, clay phacelia, clay reed-mustard, Deseret milkvetch, Graham's beardtongue, Jones' cycladenia, Pariette cactus, shrubby reed-mustard, Uinta Basin hookless cactus, or White River beardtongue habitat is not known to occur in the areas crossed by the COUT BAX alternative routes and would not be affected by any of the COUT BAX alternative routes. Additionally, no occurrences of these species are located within 1 mile of any COUT BAX alternative routes.

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-57).

Alternative COUT BAX-B in Colorado crosses Ute ladies'-tresses potential habitat (Table 3-72) on the floodplain of the White River in Rio Blanco County.

No occurrences of federally listed plant species are within 1 mile of the centerline of Alternative COUT BAX-B in Colorado.

Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of Alternative COUT BAX-B in Colorado:

- 1 occurrence of caespitose cats'-eye
- 3 occurrences of debris milkvetch
- 1 occurrence of Duchesne milkvetch
- 2 occurrences of Ferron's milkvetch
- 1 occurrence of Grand Junction suncup
- 1 occurrence of Jones' bluestar
- 2 occurrences of narrow-stem gilia
- 1 occurrence of Ownbey's thistle
- 3 occurrences of Rollins' cat's-eye
- 1 occurrence of twisted buckwheat
- 1 occurrence of Uinta Basin spring-parsley.

TABLE 3-72
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Special Status Plant Species Habitat (miles crossed)		
		Cisco Milkvetch	San Rafael Cactus	Ute Ladies'-tresses
COUT BAX-B	279.2	30.7	0.0	1.4
Colorado	*86.7*	*0.0*	*0.0*	*0.1*
Utah	*192.5*	*30.7*	*0.0*	*1.3*
COUT BAX-C	289.7	30.7	0.7	1.4
Colorado	*86.7*	*0.0*	*0.0*	*0.1*
Utah	*203.0*	*30.7*	*0.7*	*1.3*
COUT BAX-E	291.5	30.7	0.0	1.2
Colorado	*86.7*	*0.0*	*0.0*	*0.1*
Utah	*204.8*	*30.7*	*0.0*	*1.1*

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Potential residual impacts on special status plant resources crossed by Alternative COUT BAX-B in Colorado after application of selective mitigation measures are shown in Table 3-73.

This alternative route in Colorado crosses Ute ladies'-tresses potential habitat (Table 3-72). Residual impacts on Ute ladies'-tresses would be low (Table 3-73), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

TABLE 3-73 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES			
	Residual Impacts (miles crossed)		
Alternative Route	Low	Moderate	High
COUT BAX-B	1.4	30.7	0.0
Colorado	*0.1*	*0.0*	*0.0*
Utah	*1.3*	*30.7*	*0.0*
COUT BAX-C	2.1	30.7	0.0
Colorado	*0.1*	*0.0*	*0.0*
Utah	*2.0*	*30.7*	*0.0*
COUT BAX-E	1.2	30.7	0.0
Colorado	*0.1*	*0.0*	*0.0*
Utah	*1.1*	*30.7*	*0.0*

Results of Additional Analysis of Potential Impacts

The extent of Ute ladies'-tresses potential habitat that may be affected by Alternative COUT BAX-B in Colorado is presented in Table 3-74.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences and occupied habit for Cisco milkvetch, San Rafael cactus, and the several BLM- and USFS-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

TABLE 3-74 ESTIMATED EXTENT (IN ACRES) OF SPECIAL STATUS PLANT SPECIES HABITAT AFFECTED FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES			
	Special Status Plant Species Habitat (acres)		
Alternative Route	Cisco Milkvetch	San Rafael Cactus	Ute Ladies'-tresses
COUT BAX-B	529	0	24
Colorado	*0*	*0*	*2*
Utah	*529*	*0*	*22*
COUT BAX-C	520	12	24
Colorado	*0*	*0*	*2*
Utah	*520*	*12*	*22*
COUT BAX-E	504	0	20
Colorado	*0*	*0*	*2*
Utah	*504*	*0*	*18*

Affected Environment (Utah)

Alternative COUT BAX-B in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-57).

Alternative COUT BAX-B in Utah crosses Cisco milkvetch habitat (Table 3-72) in the areas of Whipshaw Flat, Sagers Flat, and Danish Flat to the southeast of the Book Cliffs in Grand County.

Alternative COUT BAX-B in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-72) in six areas:

- the floodplain of the Green River in Grand County
- the floodplain of Huntington Creek in Emery County
- wetlands in the area of Wilberg Flat in Emery County
- the floodplain of the San Pitch River in Sanpete County
- wetlands and riparian areas in the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Two occurrences of Cisco milkvetch and one occurrence of San Rafael cactus are within 1 mile of the centerline of Alternative COUT BAX-B in Utah.

Several occurrences of BLM- and USFS-listed sensitive plant species are located within 1 mile of the centerline of Alternative COUT BAX-B in Utah:

- 1 occurrence of Bolander's camissonia
- 1 occurrence of canyon sweet-vetch
- 2 occurrences of Carrington daisy
- 1 occurrence of Creutzfeldt's cat's-eye
- 1 occurrence of Ferron's milkvetch
- 1 occurrence of Psoralea globemallow
- 1 occurrence of Thompson's talinum
- 3 occurrences of twisted buckwheat
- 1 occurrence of Untermann's daisy

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT BAX-B in Utah crosses Cisco milkvetch potential habitat (Table 3-72). Residual impacts on Cisco milkvetch would be moderate (Table 3-73), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT BAX-B in Utah crosses Ute ladies'-tresses potential habitat (Table 3-72). Residual impacts on Ute ladies'-tresses would be low (Table 3-73), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Cisco milkvetch and Ute ladies'-tresses potential habitat that may be affected by Alternative COUT BAX-B in Utah is presented in Table 3-74.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously

unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-B could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT BAX-C

Affected Environment and Environmental Consequences Colorado

The affected environment and environmental consequences of Alternative COUT BAX-C in Colorado would be the same as those for Alternative COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-57).

Alternative COUT BAX-C in Utah crosses potential Cisco milkvetch habitat (Table 3-72) in the areas of Whipshaw Flat, Sagers Flat, and Danish Flat to the southeast of the Book Cliffs in Grand County.

Alternative COUT BAX-C in Utah also crosses known San Rafael cactus habitat (Table 3-72) in Emery County in the Furniture Draw area south of the Cedar Mountains.

Alternative COUT BAX-C in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-72) in six areas:

- the floodplain of the Green River in Grand County
- the floodplain of Huntington Creek in Emery County
- wetlands in the area of Wilberg Flat in Emery County
- the floodplain of the San Pitch River in Sanpete County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Two occurrences of Cisco milkvetch and one occurrence of San Rafael cactus are within 1 mile of the centerline of Alternative COUT BAX-C in Utah.

Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of Alternative COUT BAX-C in Utah:

- 1 occurrence of canyon sweet-vetch
- 2 occurrences of Carrington daisy
- 1 occurrence of Creutzfeldt's cat's-eye
- 3 occurrences of Ferron's milkvetch
- 3 occurrences of twisted buckwheat
- 1 occurrence of Untermann's daisy.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT BAX-C in Utah crosses Ute ladies'-tresses potential habitat (Table 3-72). Residual impacts on Ute ladies'-tresses would be low (Table 3-73), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT BAX-C in Utah also crosses San Rafael cactus potential habitat (Table 3-72). Residual impacts on San Rafael cactus would be low (Table 3-73), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT BAX-C in Utah also crosses Cisco milkvetch potential habitat (Table 3-72). Residual impacts on Cisco milkvetch would be moderate (Table 3-73), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Cisco milkvetch, San Rafael cactus, and Ute ladies'-tresses habitat that may be affected by Alternative COUT BAX-C in Utah is presented in Table 3-74.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-C could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT BAX-E

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT BAX-E in Colorado would be the same as those for Alternative COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-57).

Alternative COUT BAX-E in Utah crosses Cisco milkvetch potential habitat (Table 3-72) in the areas of Whipshaw Flat, Sagers Flat, and Danish Flat to the southeast of the Book Cliffs in Grand County.

Alternative COUT BAX-E in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-72) in seven areas:

- the floodplain of the Green River in Grand County
- the floodplain of the Price River in two locations in Emery County
- the floodplain of the Grassy Trail Creek in Emery County
- Marsing Wash in Emery County
- Bob Wright Wash in Carbon County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Two occurrences of Cisco milkvetch are found within 1 mile of the centerline of Alternative COUT BAX-E in Utah.

Three occurrences of Ferron's milkvetch and three occurrences of twisted buckwheat, both BLM-listed sensitive species, are within 1 mile of the centerline of Alternative COUT BAX-E in Utah.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT BAX-E crosses Cisco milkvetch potential habitat (Table 3-72). Residual impacts on Cisco milkvetch would be moderate (Table 3-73), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT BAX-E also crosses Ute ladies'-tresses potential habitat (Table 3-72). Residual impacts on Ute ladies'-tresses would be low (Table 3-73), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Cisco milkvetch and Ute ladies'-tresses potential habitat that may be affected by Alternative COUT BAX-E in Utah is presented in Table 3-72.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences and occupied habitat for Cisco milkvetch and the two of BLM-listed sensitive plant species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the

applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-E could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

The COUT route grouping occurs from U.S. Highway 40 in Colorado to Clover, Utah by way of the Uinta Basin (Map 2-1b). This grouping is predominantly in the Colorado Plateaus Ecoregion but crosses into the Wasatch and Uinta Mountains and Central Basin and Range ecoregions as it approaches Mona, Utah (refer to Section 3.2.5.3 for ecoregion descriptions).

Habitat for Barneby ridge-cress, Cisco milkvetch, Deseret milkvetch, Jones' cycladenia, San Rafael cactus, or shrubby reed-mustard is not known to occur in the areas crossed by the COUT alternative routes and would not be affected by any of the COUT alternative routes. Additionally, no occurrences of Cisco milkvetch, Dudley Bluffs twinpod, Jones' cycladenia, Pariette cactus, San Rafael cactus, or shrubby reed-mustard are located within 1 mile of any COUT BAX alternative routes.

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A in Colorado predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

No known or potential habitat for federally listed plant species is crossed by Alternative COUT-A in Colorado (Table 3-75).

No documented occurrences of federally listed plant species are located within 1 mile of the centerline of Alternative COUT-A in Colorado.

One occurrence of debris milkvetch, one occurrence of narrow-stem gilia, and one occurrence of Ownbey's thistle, all BLM-listed sensitive species, occur within 1 mile of the centerline of Alternative COUT-A in Colorado.

TABLE 3-75
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Special Status Plant Species Habitat (miles crossed)								
		Clay Phacelia	Clay Reed-mustard	Deseret Milkvetch	Graham's Beardtongue	Level 1 *Sclerocactus* Core Habitat (high density occupied habitat)	Level 2 *Sclerocactus* Core Habitat (low density occupied habitat)	Uinta Basin Hookless Cactus (potential habitat)	Ute Ladies'-tresses	White River Beardtongue
Alternative COUT-A and Route Variation										
COUT-A	206.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*182.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.8*	*0.0*
COUT-A-1	205.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*4.8*	*0.0*
Alternative COUT-B and Route Variations										
COUT-B	216.0	0.9	0.0	0.0	13.8	0.0	0.0	0.0	6.0	13.8
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*192.0*	*0.9*	*0.0*	*0.0*	*13.8*	*0.0*	*0.0*	*0.0*	*6.0*	*13.8*
COUT-B-1	212.7	0.9	0.0	0.0	15.1	0.0	0.0	0.0	6.0	15.1
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*188.7*	*0.9*	*0.0*	*0.0*	*15.1*	*0.0*	*0.0*	*0.0*	*6.0*	*15.1*
COUT-B-2	214.2	0.9	0.0	0.0	13.9	0.0	0.0	0.0	6.0	13.9
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*0.9*	*0.0*	*0.0*	*13.9*	*0.0*	*0.0*	*0.0*	*6.0*	*13.9*
COUT-B-3	213.9	0.9	0.0	0.0	13.8	0.0	0.0	0.0	6.0	13.8
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*0.9*	*0.0*	*0.0*	*13.8*	*0.0*	*0.0*	*0.0*	*6.0*	*13.8*
COUT-B-4	214.2	0.9	0.0	0.0	13.8	0.0	0.0	0.0	6.0	13.8
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*0.9*	*0.0*	*0.0*	*13.8*	*0.0*	*0.0*	*0.0*	*6.0*	*13.8*
COUT-B-5	213.9	0.9	0.0	0.0	13.9	0.0	0.0	0.0	6.0	13.9
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*0.9*	*0.0*	*0.0*	*13.9*	*0.0*	*0.0*	*0.0*	*6.0*	*13.9*

TABLE 3-75
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES INVENTORY DATA FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Special Status Plant Species Habitat (miles crossed)								
		Clay Phacelia	Clay Reed-mustard	Deseret Milkvetch	Graham's Beardtongue	Level 1 *Sclerocactus* Core Habitat (high density occupied habitat)	Level 2 *Sclerocactus* Core Habitat (low density occupied habitat)	Uinta Basin Hookless Cactus (potential habitat)	Ute Ladies'-tresses	White River Beardtongue
Alternative COUT-C and Route Variations										
COUT-C	209.8	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	6.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*185.0*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*5.9*
COUT-C-1	206.4	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	17.3
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*181.6*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*17.2*
COUT-C-2	207.9	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	16.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*183.1*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*16.0*
COUT-C-3 (Agency Preferred Alternative)	207.6	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	16.1
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*182.8*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*16.0*
COUT-C-4	207.9	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	6.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*183.1*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*5.9*
COUT-C-5	207.6	0.9	0.6	0.0	6.0	3.4	9.0	36.1	0.9	6.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*182.8*	*0.9*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*5.9*
Alternatives COUT-H and COUT-I										
COUT-H (Applicant Preferred Alternative)	200.6	0.0	0.6	0.0	6.0	3.4	9.0	36.1	0.9	6.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*175.8*	*0.0*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*0.9*	*5.9*
COUT-I	240.2	0.0	0.6	0.0	6.0	3.4	9.0	36.1	1.0	6.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Utah	*215.4*	*0.0*	*0.6*	*0.0*	*5.9*	*3.4*	*9.0*	*36.1*	*1.0*	*5.9*

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

No known or potential habitat for federally listed plant species are crossed by Alternative COUT-A and Route Variation COUT-A-1 in Colorado (Table 3-75) and therefore no residual impacts on special status plant species would occur (Table 3-76).

TABLE 3-76
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Residual Impacts (miles crossed)		
	Low	Moderate	High
Alternative COUT-A and Route Variation			
COUT-A	4.8	0.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*4.8*	*0.1*	*0.0*
COUT-A-1	4.8	0.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*4.8*	*0.1*	*0.0*
Alternative COUT-B and Route Variations			
COUT-B	19.8	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*19.8*	*1.1*	*0.0*
COUT-B-1	21.1	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*21.1*	*1.1*	*0.0*
COUT-B-2	19.9	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*19.9*	*1.1*	*0.0*
COUT-B-3	19.8	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*19.8*	*1.1*	*0.0*
COUT-B-4	19.8	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*19.8*	*1.1*	*0.0*
COUT-B-5	19.9	1.1	0.0
Colorado	*0.0*	*0.0*	*0.0*
Utah	*19.9*	*1.1*	*0.0*

TABLE 3-76 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS PLANT RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES			
Alternative Route	**Residual Impacts (miles crossed)**		
	Low	**Moderate**	**High**
Alternative COUT-C and Route Variations			
COUT-C *Colorado* *Utah*	40.0 *0.2* 38.8	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
COUT-C-1 *Colorado* *Utah*	50.3 *0.2* 50.1	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
COUT-C-2 *Colorado* *Utah*	49.1 *0.2* 48.9	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
COUT-C-3 (Agency Preferred Alternative) *Colorado* *Utah*	49.1 *0.2* 48.9	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
COUT-C-4 *Colorado* *Utah*	40.0 *0.2* 38.8	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
COUT-C-5 *Colorado* *Utah*	40.0 *0.2* 38.0	5.0 *0.0* *5.0*	0.0 *0.0* *0.0*
Alternatives COUT-H and COUT-I			
COUT-H (Applicant Preferred Alternative) *Colorado* *Utah*	41.3 *0.2* *41.1*	3.9 *0.0* *3.9*	0.0 *0.0* *0.0*
COUT-I *Colorado* *Utah*	41.4 *0.2* *41.2*	3.9 *0.0* *3.9*	0.0 *0.0* *0.0*

Results of Additional Analysis of Potential Impacts

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Affected Environment (Utah)

Alternative COUT-A and Route Variation COUT-A-1 in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-A and Route Variation COUT-A-1 in Utah crosses Ute ladies'-tresses potential habitat (Table 3-75) in the following areas:

- the floodplain of the Green River in Grand County
- wetlands around the Ouray Valley Canal in Uintah County
- the floodplain of the Uinta River in Uintah County
- the floodplain of Dry Gulch Creek and its tributaries in Uintah County
- wetlands in Cobble Hollow in Duchesne County
- wetlands in Big Sand Wash in Duchesne County
- the floodplain of Lake Fork River in Duchesne County
- the floodplain of Duchesne River, Duchesne County
- the floodplain of Red Creek in Duchesne County
- the floodplain of Currant Creek in Duchesne County
- the floodplain of Soldier Creek in Spanish Fork Canyon in Utah County
- the floodplain of Lake Fork Creek in Utah County
- the floodplain of Thistle Creek in Utah County
- wetlands and riparian areas in the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Alternative COUT-A and Route Variation COUT-A-1 in Utah also crosses clay phacelia suitable habitat (Table 3-75) in Spanish Fork Canyon in Utah County.

One occurrence of Barneby ridge-cress, one occurrence of Deseret milkvetch (comprised of several polygons and points), and three occurrences of Ute ladies'-tresses are within 1 mile of the centerline of Alternative COUT-A and Route Variation COUT-A-1 in Utah.

Potential habitat for Hamilton's milkvetch and horseshoe milkvetch also occurs within 1 mile of the centerline of this alternative route in Utah. Two occurrences of debris milkvetch, five occurrences of Duchesne milkvetch, one occurrence of horseshoe milkvetch, and two occurrences of Uinta Basin spring-parsley, all BLM-listed sensitive species, also occur within 1 mile the centerline of Alternative COUT-A in Utah.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-A and Route Variation COUT-A-1 in Utah crosses Ute ladies'-tresses potential habitat (Table 3-75). Residual impacts on Ute ladies'-tresses would be low (Table 3-76), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-A and Route Variation COUT-A-1 in Utah crosses clay phacelia habitat (Table 3-75). Residual impacts on clay phacelia would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of clay phacelia habitat and Ute ladies'-tresses potential habitat that may be affected by Alternatives COUT-A and Route Variation COUT-A-1 in Utah are presented in Table 3-77.

Potential habitat for clay phacelia would be crossed by this alternative, though all known populations and reintroduction sites of this species would be avoided. USFS has conducted surveys for clay phacelia in some areas of potential habitat, though complete, systematic surveys have not been conducted in all

habitat (Leinbach 2013). Large annual fluctuations in the number of plants detectable at known sites have been observed (Leinbach 2013) and undetected populations of clay phacelia may occur in surveyed or unsurveyed potential habitats. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) and Project construction would be avoided in all occupied habitat. Additionally, conservation measures for clay phacelia were developed in 2013 as a collaborative effort between the USFS and FWS (Tables E-15 and E-16, Appendix E). These include the avoidance of modeled suitable habitat (including buffered areas) for activities such as road construction, permanent features, vegetation treatments (including weed management), and stringing of wires between towers (refer to Appendix E for a complete list). If avoidance is not possible in suitable habitat, the USFS and FWS recommend that total cumulative disturbance not exceed 10 percent. Additional mitigation may be required in the event of disturbance on suitable habitat for this species. Disturbance would not be allowed within 650 feet of known occupied habitat or reintroduction sites.

TABLE 3-77
ESTIMATED EXTENT (IN ACRES) OF SPECIAL STATUS PLANT SPECIES HABITAT AFFECTED FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Clay Phacelia	Clay Reed-mustard	Deseret Milkvetch	Graham's Beardtongue	Level 1 *Sclerocactus* Core Habitat (high density occupied habitat)	Level 2 *Sclerocactus* Core Habitat (low density occupied habitat)	Uinta Basin Hookless Cactus (potential habitat)	Ute Ladies'-tresses	White River Beardtongue
Alternative COUT-A and Route Variation									
COUT-A	1	0	0	0	0	0	0	89	0
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*89*	*0*
COUT-A-1	1	0	0	0	0	0	0	89	0
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*89*	*0*
Alternative COUT-B and Route Variations									
COUT-B	16	0	0	252	0	0	0	110	252
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*252*	*0*	*0*	*0*	*110*	*252*
COUT-B-1	16	0	0	278	0	0	0	111	278
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*278*	*0*	*0*	*0*	*111*	*278*
COUT-B-2	16	0	0	256	0	0	0	110	256
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*256*	*0*	*0*	*0*	*110*	*256*
COUT-B-3	16	0	0	254	0	0	0	110	254
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*254*	*0*	*0*	*0*	*110*	*254*
COUT-B-4	16	0	0	254	0	0	0	110	254
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*254*	*0*	*0*	*0*	*110*	*254*

TABLE 3-77
ESTIMATED EXTENT (IN ACRES) OF SPECIAL STATUS PLANT SPECIES HABITAT AFFECTED FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Clay Phacelia	Clay Reed-mustard	Deseret Milkvetch	Graham's Beardtongue	Level 1 *Sclerocactus* Core Habitat (high density occupied habitat)	Level 2 *Sclerocactus* Core Habitat (low density occupied habitat)	Uinta Basin Hookless Cactus (potential habitat)	Ute Ladies'-tresses	White River Beardtongue
COUT-B-5	16	0	0	262	0	0	0	113	262
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*16*	*0*	*0*	*262*	*0*	*0*	*0*	*113*	*262*
Alternative COUT-C and Route Variations									
COUT-C	16	12	0	115	65	173	692	17	115
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*12*	*0*	*113*	*65*	*173*	*692*	*17*	*113*
COUT-C-1	16	12	0	334	66	174	698	17	334
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*12*	*0*	*333*	*66*	*174*	*698*	*17*	*333*
COUT-C-2	16	12	0	310	66	174	696	17	310
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*12*	*0*	*309*	*66*	*174*	*696*	*17*	*309*
COUT-C-3 (Agency Preferred Alternative)	16	12	0	313	66	175	702	18	313
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*12*	*0*	*311*	*66*	*175*	*702*	*18*	*311*
COUT-C-4	16	12	0	117	66	175	702	18	117
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*12*	*0*	*115*	*66*	*175*	*702*	*18*	*115*
COUT-C-5	16	11	0	113	64	169	680	17	113
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*16*	*11*	*0*	*111*	*64*	*169*	*680*	*17*	*111*
Alternatives COUT-H and COUT-I									
COUT-H (Applicant Preferred Alternative)	0	11	0	111	63	166	665	17	111
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*0*	*11*	*0*	*109*	*63*	*166*	*665*	*17*	*109*
COUT-I	0	11	0	109	62	163	*655*	18	109
Colorado	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*2*
Utah	*0*	*11*	*0*	*107*	*62*	*163*	*655*	*18*	*107*

NOTE: Acres in the table are rounded and, therefore, columns may not sum exactly.

Habitat for Deseret milkvetch is not directly crossed by Project centerlines; however, the single occurrence of Deseret milkvetch within 1 mile of the centerline of this alternative is the only known population of this species and is located adjacent to an access road on UDWR property. Though the centerline of this alternative does not cross habitat for this species, impacts on habitat and populations of this species could occur if this access road is used and improved during Project construction and maintenance.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of Barneby ridge-cress, Ute ladies'-tresses, and the several BLM-listed sensitive species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Quantitative analysis of impacts on the habitat or populations of these species is not possible without site-specific engineering design; however, habitat and occurrences of all special status plant species would be avoided wherever practicable through incorporation of Selective Mitigation Measures 2 and 7.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-A and associated route variation would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT-A and associated route variation could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT-B and route variations in Colorado would be the same as those for Alternative COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-B in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-B in Utah crosses clay phacelia suitable habitat (Table 3-75) in Spanish Fork Canyon in Utah County.

Alternative COUT-B in Utah crosses habitat for both Graham's beardtongue and White River beardtongue (Table 3-75) in Sowers Canyon, Duchesne County.

Alternative COUT-B in Utah crosses Ute ladies'-tresses potential habitat (Table 3-75) in the following areas:

- the floodplain of the Green River in Grand County
- wetlands around the Ouray Valley Canal in Uintah County
- the floodplain of the Uinta River in Uintah County
- the floodplain of Dry Gulch Creek and its tributaries in Uintah County
- wetlands in Cobble Hollow in Duchesne County
- wetlands in Big Sand Wash in Duchesne County
- the floodplain of Lake Fork River in Duchesne County
- wetlands in Zimmerman Wash in Duchesne County
- the floodplain of Duchesne River, Duchesne County
- stream banks in Sowers Canyon, Duchesne County
- the floodplain of Soldier Creek in Spanish Fork Canyon, Utah County
- the floodplain of Lake Fork Creek in Utah County
- the floodplain of Thistle Creek in Utah County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Three occurrences of clay phacelia (all known populations of this species) and several reintroduction sites are within 1 mile of the centerline of Alternative COUT-B in Utah. One occurrence of Deseret milkvetch (comprised of several polygons and points) is within 1 mile of the centerline of this alternative route. One occurrence of Ute ladies'-tresses is also within 1 mile of the centerline of this alternative route.

Potential habitat for horseshoe milkvetch and Hamilton's milkvetch occurs within 1 mile of the centerline of Alternative COUT-B in Utah. Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of this alternative route in Utah:

- 1 occurrence of Barneby's cat's-eye
- 2 occurrences of debris milkvetch
- 5 occurrences of Duchesne milkvetch
- 1 occurrence of Goodrich's blazingstar
- 5 occurrences of Goodrich's columbine
- 1 occurrence of horseshoe milkvetch
- 2 occurrences of Uinta Basin spring-parsley
- 2 occurrences of Untermann's daisy (each consisting of several mapped populations).

Environmental Consequences (Utah)

Alternative COUT-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-B in Utah crosses clay phacelia habitat (Table 3-75). Residual impacts on clay phacelia would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT-B in Utah also crosses Graham's beardtongue and White River beardtongue potential habitat (Table 3-75). Residual impacts on Graham's beardtongue and White River beardtongue would be low (Table 3-76, as Project activities would have only minor adverse effects on these species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-B in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75). Residual impacts on Ute ladies'-tresses would be low (Table 3-76), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of clay phacelia, Graham's beardtongue, White River beardtongue, and Ute ladies'-tresses habitat that may be affected by Alternative COUT-B in Utah is presented in Table 3-77.

Potential habitat for clay phacelia would be crossed by this alternative, though all known populations and reintroduction sites of this species would be avoided. USFS has conducted surveys for clay phacelia in some areas of potential habitat, though complete, systematic surveys have not been conducted in all habitat (Leinbach 2013). Large annual fluctuations in the number of plants detectable at known sites have been observed (Leinbach 2013) and undetected populations of clay phacelia may occur in surveyed or unsurveyed potential habitats. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) and Project construction would be avoided in all occupied habitat. Additionally, conservation measures for clay phacelia were developed in 2013 as a collaborative effort between the USFS and FWS (Tables E-15 and E-16, Appendix E). These include the avoidance of modeled suitable habitat (including buffered areas) for activities such as road construction, permanent features, vegetation treatments (including weed management), and stringing of wires between towers (refer to Appendix E for a complete list). If avoidance is not possible in suitable habitat, the USFS and FWS recommend that total cumulative disturbance not exceed 10 percent. Additional mitigation may be required in the event of disturbance to suitable habitat for this species. Disturbance would not be allowed within 650 feet of known occupied habitat or reintroduction sites.

Habitat for Deseret milkvetch is not directly crossed by Project centerlines; however, the single occurrence of Deseret milkvetch within 1 mile of the centerline of this alternative is the only known population of this species and is located adjacent to an access road on UDWR property. Though the centerline of this alternative does not cross habitat for this species, impacts on habitat and populations of this species could occur if this access road is used and improved during Project construction and maintenance.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of Ute ladies'-tresses and the several BLM- and USFS-listed sensitive plant species within 1 mile of this alternative route; therefore it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Based on data available for analysis, impacts of Route Variation COUT-B-1 in Utah on occurrences or habitat of special status plants would be the same as those of COUT-B in Utah. One fewer occurrence of clay phacelia would be within 1 mile of the centerlines for Route Variations COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah as compared to Alternative COUT-B in Utah.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-B and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Report which is available for review and download from the Project website. The analysis found that Alternative COUT-B and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C and associated route variations in Colorado predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-C and associated route variations in Colorado crosses habitat for both Graham's beardtongue and White River beardtongue (Table 3-75) in Rio Blanco County, Colorado.

One occurrence of Graham's beardtongue is within 1 mile of the centerline of Alternative COUT-C in Colorado.

Several BLM-listed sensitive plant species are within 1 mile of the centerline of Alternative COUT-C in Colorado:

- 2 occurrence of debris milkvetch
- 1 occurrence of narrow-stem gilia
- 1 occurrence of Ownbey's thistle

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-C and associated route variations in Colorado crosses Graham's beardtongue and White River beardtongue potential habitat (Table 3-75). Residual impacts on Graham's beardtongue and White River beardtongue would be low (Table 3-76), as Project activities would have only minor adverse effects on these species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of Graham's beardtongue and White River beardtongue known habitat that may be affected by Alternative COUT-C and associated route variations in Colorado is presented in Table 3-77. Habitat for Graham's beardtongue and White River beardtongue are exclusion areas for new rights-of-way authorizations per the BLM White River Field Office RMP (BLM 1997). A plan amendment could be required if habitats were to be crossed by the Project (Table 5-6).

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of Graham's beardtongue and the several BLM-listed sensitive plant species within 1 mile of this alternative route; therefore it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this

analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable.

Affected Environment (Utah)

Alternative COUT-C in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-C in Utah crosses clay phacelia suitable habitat (Table 3-75) in Spanish Fork Canyon.

Alternative COUT-C in Utah also crosses clay reed-mustard habitat (Table 3-75) in Uintah County near the banks of the Green River.

Alternative COUT-C in Utah also crosses habitat for both Graham's beardtongue and White River beardtongue (Table 3-75) in the area from the Bad Land Cliffs to Argyle Canyon in Duchesne County. Proposed critical habitat for Graham's beardtongue also occurs within 1 mile of this alternative route in Utah near the Ray's Bottom section of the Green River.

Alternative COUT-C in Utah also crosses known Uinta Basin hookless cactus habitat and Level 1 and Level 2 *Sclerocactus* core habitat in the Uinta Basin (Table 3-75). The dominant federally listed plant species in these areas is assumed to be Uinta Basin hookless cactus, though Pariette cactus also may occur.

Alternative COUT-C in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75) in the following areas

- the floodplain of Willow Creek in Uintah County
- the floodplain of the Green River in Uintah County
- the floodplain of Soldier Creek in Spanish Fork Canyon in Utah County,
- Lake Fork Creek in Utah County
- the floodplain of Thistle Creek in Utah County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Three occurrences and several introduction sites of clay phacelia (all known populations of this species), two occurrences of clay reed-mustard, one occurrence of Deseret milkvetch (comprised of several polygons and points), three occurrences of Graham's beardtongue, and six occurrences of Uinta Basin hookless cactus are within 1 mile of the centerline of this alternative route in Utah.

Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of this alternative route in Utah: (1) one occurrence of caespitose cat's-eye, (2) five occurrences of debris milkvetch, (3) one occurrence of Duchesne milkvetch, (4) two occurrences of Goodrich's blazingstar, (5) one occurrence of horseshoe milkvetch, and (6) two occurrences of Uinta Basin spring-parsley.

Environmental Consequences (Utah)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-C in Utah crosses clay phacelia habitat (Table 3-75). Residual impacts on clay phacelia would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT-C in Utah also crosses clay reed-mustard habitat (Table 3-75). Residual impacts on clay reed-mustard would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT-C in Utah also crosses Graham's beardtongue and White River beardtongue potential habitat (Table 3-75). Residual impacts on Graham's beardtongue and White River beardtongue would be low (Table 3-76), as Project activities would have only minor adverse effects on these species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-C in Utah also crosses Uinta Basin hookless cactus habitat (Table 3-75). Residual impacts on Uinta Basin hookless cactus habitat are low (Table 3-76), as Project activities in these areas would have only minor adverse effects on Uinta Basin hookless cactus and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-C in Utah also crosses Level 1 and Level 2 *Sclerocactus* core habitat (Table 3-75). Densities of cacti in Level 2 *Sclerocactus* core habitat are low, and the line would be sited to avoid plants as practicable. In areas where complete avoidance is not possible, additional mitigation would be applied in accordance with agency policy. Therefore, residual impacts within Level 2 *Sclerocactus* core habitat would be low (Table 3-76). Densities of cacti in Level 1 *Sclerocactus* core habitat are higher than in Level 2 *Sclerocactus* core habitat, and therefore residual impacts within Level 1 *Sclerocactus* core habitat would be moderate (Table 3-76). As with Level 2 *Sclerocactus* core habitat, the line in Level 1 *Sclerocactus* core habitat would be sited to avoid plants as practicable and additional mitigation would be applied in accordance with agency policy where complete avoidance is not possible.

Alternative COUT-C in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75). Residual impacts on Ute ladies'-tresses would be low (Table 3-76), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of clay phacelia habitat, clay reed mustard habitat, Graham's beardtongue potential habitat, *Sclerocactus* core habitat, Uinta Basin hookless cactus habitat, Ute ladies'-tresses potential habitat, and White River beardtongue potential habitat that may be affected by Alternative COUT-C in Utah is presented in Table 3-77.

Potential habitat for clay phacelia would be crossed by this alternative, though all known populations and reintroduction sites of this species would be avoided. USFS has conducted surveys for clay phacelia in some areas of potential habitat, though complete, systematic surveys have not been conducted in all habitat (Leinbach 2013). Large annual fluctuations in the number of plants detectable at known sites have been observed (Leinbach 2013) and undetected populations of clay phacelia may occur in surveyed or unsurveyed potential habitats. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) and Project construction would be avoided in all occupied habitat. Additionally, conservation measures for clay phacelia were developed in 2013 as a collaborative effort between the USFS and FWS (Tables E-15 and E-16, Appendix E). These include the avoidance of modeled suitable habitat (including buffered areas) for activities such as road construction, permanent features, vegetation treatments (including weed management), and stringing of wires between towers (refer to Appendix E for a complete list). If avoidance is not possible in suitable habitat, the USFS and FWS recommend that total cumulative disturbance not exceed 10 percent. Additional mitigation may be required in the event of disturbance to suitable habitat for this species. Disturbance would not be allowed within 650 feet of known occupied habitat or reintroduction sites.

Habitat for Deseret milkvetch is not directly crossed by Project centerlines; however, the single occurrence of Deseret milkvetch within 1 mile of the centerline of this alternative is the only known population of this species and is located adjacent to an access road on UDWR property. Though the centerline of this alternative does not cross habitat for this species, impacts on habitat and populations of this species could occur if this access road is used and improved during Project construction and maintenance.

Level 1 and Level 2 *Sclerocactus* core habitat would be crossed by Alternative COUT-C in Utah. Uinta Basin hookless cactus individuals are known to occur in Level 1 core habitat at high densities and Level 2 core habitat at somewhat lower densities. Due to the high density of plants in *Sclerocactus* core habitat areas, individual plants may need to be relocated from areas that would be affected during construction and additional mitigation may be required by BLM or as a condition established during Section 7 consultation. It is not possible to determine the number of individual plants that would need to be relocated to construct the Project at this time, as the exact locations of construction disturbance and individual plants are not known. All actions that could affect Uinta Basin hookless cactus individuals would be subject to the conditions of established during Section 7 consultation. Preconstruction surveys would be conducted on the selected route in habitat areas using agency-approved protocols (Design Feature 3), and the number of individuals that would need to be moved would be minimized wherever practicable. Previous projects have monitored transplanted cacti for 3 years; though the exact monitoring schedule for transplanted individuals would be determined during Section 7 consultation. Additional mitigation to reduce impacts on *Sclerocactus* and promote *Sclerocactus* conservation may also be implemented based on the results of Section 7 consultation with FWS. Additional mitigation may include payments to the FWS *Sclerocactus* Mitigation Fund, purchase of conservation easements to protect the species, ground truthing the recently completed University of Wyoming habitat model for Uinta Basin hookless cactus, and funding of studies to meet objectives identified in the FWS recovery outlines for these species. Potentially funded studies may include response of *Sclerocactus* populations to climate change, monitoring of cactus-borer beetle (*Moneilema semipunctatum*) infestations, caterpillar predation and rodent browsing, and the relationship of episodic infestations with drought and other environmental factors.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of clay reed-mustard, Graham's beardtongue, and the several BLM- and USFS-listed sensitive plant species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable. Impacts on clay reed-mustard and Uinta Basin hookless cactus from this alternative route could be mitigated if the Project crossing of the Green River were relocated north of the Fourmile Bottom crossing area identified in the BLM Vernal RMP, but a plan amendment would be required (Table 5-21).

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

One fewer occurrence of clay phacelia would be within 1 mile of the centerlines for Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah as compared to Alternative COUT-C in Utah.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-C and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT-C and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT-H in Colorado would be the same as those for Alternative COUT-C in Colorado.

Affected Environment (Utah)

Alternative COUT-H in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-H in Utah crosses clay reed-mustard habitat (Table 3-75) in Uintah County near the banks of the Green River.

Alternative COUT-H in Utah also crosses habitat for both Graham's beardtongue and White River beardtongue (Table 3-75) in the area between the Bad Land Cliffs to Argyle Canyon in Duchesne County. Proposed critical habitat for Graham's beardtongue also occurs within 1 mile of this alternative route in Utah near the Ray's Bottom section of the Green River.

Alternative COUT-H in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75) in six areas:

- the floodplain of Willow Creek in Uintah County
- the floodplain of the Green River in Uintah County
- the floodplain of Willow Creek in Carbon County
- the floodplain of Gordon Creek in Carbon County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Alternative COUT-H in Utah also crosses known Uinta Basin hookless cactus habitat and Level 1 and Level 2 *Sclerocactus* core habitat areas (Table 3-75) within the Uinta Basin. The dominant federally listed plant species in these areas is assumed to be Uinta Basin hookless cactus, though Pariette cactus also may occur.

Two occurrences of clay reed-mustard, three occurrences of Graham's beardtongue, and six occurrences of Uinta Basin hookless cactus are within 1 mile of the centerline of Alternative COUT-H in Utah.

Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of Alternative COUT-H in Utah:

- 1 occurrence of canyon sweet-vetch
- 1 occurrence of caespitose cat's-eye
- 5 occurrences of debris milkvetch
- 1 occurrence of Duchesne milkvetch

- 1 occurrence of Goodrich's blazingstar
- 1 occurrence of horseshoe milkvetch
- 2 occurrences of Uinta Basin spring-parsley.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-H in Utah crosses clay reed-mustard habitat (Table 3-75). Residual impacts on clay reed-mustard would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT-H in Utah also crosses Graham's beardtongue and White River beardtongue potential habitat (Table 3-75). Residual impacts on Graham's beardtongue and White River beardtongue would be low (Table 3-76), as Project activities would have only minor adverse effects on these species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-H in Utah also crosses Uinta Basin hookless cactus habitat (Table 3-75). Residual impacts on Uinta Basin hookless cactus habitat are low (Table 3-76), as Project activities in these areas would have only minor adverse effects on Uinta Basin hookless cactus and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-H in Utah also crosses Level 1 and Level 2 *Sclerocactus* core habitat (Table 3-75). Densities of cacti in Level 2 *Sclerocactus* core habitat are low, and the line would be sited to avoid plants as practicable. In areas where complete avoidance is not possible, additional mitigation would be applied in accordance with agency policy. Therefore, residual impacts within Level 2 *Sclerocactus* core habitat would be low (Table 3-76). Densities of cacti in Level 2 *Sclerocactus* core habitat are higher than in Level 2 *Sclerocactus* core habitat, and therefore residual impacts within Level 1 *Sclerocactus* core habitat would be moderate (Table 3-76). As with Level 2 *Sclerocactus* core habitat, the line in Level 1 *Sclerocactus* core habitat would be sited to avoid plants as practicable and additional mitigation would be applied in accordance with agency policy where complete avoidance is not possible.

Alternative COUT-H in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75). Residual impacts on Ute ladies'-tresses would be low (Table 3-76), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of clay reed mustard habitat, Graham's beardtongue habitat, *Sclerocactus* core habitat, Uinta Basin hookless cactus habitat, Ute ladies'-tresses potential habitat, and White River beardtongue habitat that may be affected by Alternative COUT-H in Utah is presented in Table 3-77. Level 1 and Level 2 *Sclerocactus* core habitat would be crossed by Alternative COUT-H in Utah. Uinta Basin hookless cactus individuals are known to occur in Level 1 core habitat at high densities and Level 2 core habitat at somewhat lower densities. Due to the high density of plants in *Sclerocactus* core habitat areas, individual plants may need to be relocated from areas that would be affected during construction and additional mitigation may be required by BLM or as a condition established during Section 7 consultation. It is not possible to determine the number of individual plants that would need to be relocated to construct the project at this time, as the exact locations of construction disturbance and individual plants are not known. All actions that could be affect Uinta Basin hookless cactus individuals would be subject to the conditions of established during Section 7 consultation. Preconstruction surveys would be conducted on the selected route in habitat areas using agency-approved protocols (Design Feature 3), and the number of individuals

that would need to be moved would be minimized wherever practicable. Previous projects have monitored transplanted cacti for 3 years; though the exact monitoring schedule for transplanted individuals would occur be determined during Section 7 consultation. Additional mitigation to reduce impacts on *Sclerocactus* and promote *Sclerocactus* conservation may also be implemented based on the results of Section 7 consultation with FWS. Additional mitigation may include payments to the FWS *Sclerocactus* Mitigation Fund, purchase of conservation easements to protect the species, ground truthing the recently completed University of Wyoming habitat model for Uinta Basin hookless cactus, and funding of studies to meet objectives identified in the FWS recovery outlines for these species. Potentially funded studies may include response of *Sclerocactus* populations to climate change, monitoring of cactus-borer beetle (*Moneilema semipunctatum*) infestations, caterpillar predation and rodent browsing, and the relationship of episodic infestations with drought and other environmental factors.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of clay reed-mustard, Graham's beardtongue, and the several BLM- and USFS-listed sensitive plant species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable. Impacts on clay reed-mustard and Uinta Basin hookless cactus from this alternative route could be mitigated if the Project crossing of the Green River were relocated north of the Fourmile Bottom crossing area identified in the BLM Vernal RMP, but a plan amendment would be required (Table 5-21).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-H would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT-H could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

Alternative COUT-I

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences of Alternative COUT-I in Colorado would be the same as those for Alternative COUT-C in Colorado.

Affected Environment (Utah)

Alternative COUT-I in Utah predominantly crosses big sagebrush, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table 3-61).

Alternative COUT-I in Utah crosses clay reed-mustard habitat (Table 3-75) in Uintah County near the banks of the Green River.

Alternative COUT-I in Utah crosses habitat for both Graham's beardtongue and White River beardtongue (Table 3-75) in the area from the Bad Land Cliffs to Argyle Canyon in Duchesne County. Proposed

critical habitat for Graham's beardtongue also occurs within 1 mile of this alternative route in Utah near the Ray's Bottom section of the Green River.

Alternative COUT-I in Utah also crosses known Uinta Basin hookless cactus habitat and Level 1 and Level 2 *Sclerocactus* core habitat areas (Table 3-75) in the Uinta Basin. The dominant federally listed plant species in these areas is assumed to be Uinta Basin hookless cactus, though Pariette cactus may also occur.

Alternative COUT-I in Utah crosses Ute ladies'-tresses potential habitat (Table 3-75) in eight areas:

- the floodplain of Willow Creek in Uintah County
- the floodplain of the Green River in Uintah County
- the floodplain of Price River in Carbon County
- wetlands in Marsing Wash in Emery County
- the floodplain of Huntington Creek in Emery County
- the floodplain of San Pitch River in Sanpete County
- wetlands and riparian areas the canyon between Nephi and Fountain Green in Juab County
- wetlands in the Juab Valley in Juab County

Two occurrences of clay reed-mustard, three occurrences of Graham's beardtongue, and six occurrences of Uinta Basin hookless cactus are within 1 mile of the centerline of Alternative COUT-I in Utah.

Several occurrences of BLM- and USFS-listed sensitive plant species are within 1 mile of the centerline of Alternative COUT-I in Utah:

- 1 occurrence of caespitose cat's-eye
- 1 occurrence of canyon sweet-vetch
- 1 occurrence of Carrington daisy
- 5 occurrences of debris milkvetch
- 1 occurrence of Duchesne milkvetch
- 1 occurrence of Ferron's milkvetch
- 1 occurrence of Goodrich's blazingstar
- 1 occurrence of horseshoe milkvetch
- 2 occurrences of Uinta Basin spring-parsley
- 1 occurrence of Untermann's daisy.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Alternative COUT-I in Utah crosses clay reed-mustard habitat (Table 3-75). Residual impacts on clay reed-mustard would be moderate (Table 3-76), as Project activities would result in loss or adverse modification of small portions of unoccupied suitable habitat for this species (Table 3-67).

Alternative COUT-I in Utah also crosses Graham's beardtongue and White River beardtongue potential habitat (Table 3-75). Residual impacts on Graham's beardtongue and White River beardtongue would be low (Table 3-76), as Project activities would have only minor adverse effects on these species and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-I in Utah also crosses Uinta Basin hookless cactus habitat (Table 3-75). Residual impacts on Uinta Basin hookless cactus habitat are low (Table 3-76), as Project activities in these areas would have only minor adverse effects on Uinta Basin hookless cactus and would not limit the long-term sustainability of populations (Table 3-67).

Alternative COUT-I in Utah also crosses Level 1 and Level 2 *Sclerocactus* core habitat (Table 3-75). Densities of cacti in Level 2 *Sclerocactus* core habitat are low, and the line would be sited to avoid plants as practicable. In areas where complete avoidance is not possible, additional mitigation would be applied in accordance with agency policy. Therefore, residual impacts within Level 2 *Sclerocactus* core habitat would be low (Table 3-76). Densities of cacti in Level 2 *Sclerocactus* core habitat are higher than in Level 2 *Sclerocactus* core habitat, and therefore residual impacts within Level 1 *Sclerocactus* core habitat would be moderate (Table 3-76). As with Level 2 *Sclerocactus* core habitat, the line in Level 1 *Sclerocactus* core habitat would be sited to avoid plants as practicable and additional mitigation would be applied in accordance with agency policy where complete avoidance is not possible.

Alternative COUT-I in Utah also crosses Ute ladies'-tresses potential habitat (Table 3-75). Residual impacts on Ute ladies'-tresses would be low (Table 3-76), as Project activities would have only minor adverse effects on this species and would not limit the long-term sustainability of populations (Table 3-67).

Results of Additional Analysis of Potential Impacts

The extent of clay reed mustard habitat, Graham's beardtongue habitat, Ute ladies'-tresses potential habitat, *Sclerocactus* core habitat areas, Uinta Basin hookless cactus habitat, and White River beardtongue habitat that may be affected by Alternative COUT-I in Utah is presented in Table 3-77.

Level 1 and Level 2 *Sclerocactus* core habitat would be crossed by Alternative COUT-I in Utah. Uinta Basin hookless cactus individuals are known to occur in Level 1 core habitat at high densities and Level 2 core habitat at somewhat lower densities. Due to the high density of plants in *Sclerocactus* core habitat areas, individual plants may need to be relocated from areas that would be affected during construction and additional mitigation may be required by BLM or as a condition established during Section 7 consultation. It is not possible to determine the number of individual plants that would need to be relocated to construct the project at this time, as the exact locations of construction disturbance and individual plants are not known. All actions that could be affect Uinta Basin hookless cactus individuals would be subject to the conditions of established during Section 7 consultation. Preconstruction surveys would be conducted on the selected route in habitat areas using agency-approved protocols (Design Feature 3), and the number of individuals that would need to be moved would be minimized wherever practicable. Previous projects have monitored transplanted cacti for 3 years; though the exact monitoring schedule for transplanted individuals would occur be determined during Section 7 consultation. Additional mitigation to reduce impacts on *Sclerocactus* and promote *Sclerocactus* conservation may also be implemented based on the results of Section 7 consultation with FWS. Additional mitigation may include payments to the FWS *Sclerocactus* Mitigation Fund, purchase of conservation easements to protect the species, ground truthing the recently completed University of Wyoming habitat model for Uinta Basin hookless cactus, and funding of studies to meet objectives identified in the FWS recovery outlines for these species. Potentially funded studies may include response of *Sclerocactus* populations to climate change, monitoring of cactus-borer beetle (*Moneilema semipunctatum*) infestations, caterpillar predation and rodent browsing, and the relationship of episodic infestations with drought and other environmental factors.

Information is not comprehensive regarding the locations of Project activities in relation to specific occurrences of clay reed-mustard, Graham's beardtongue, and the several BLM- and USFS-listed sensitive plant species within 1 mile of this alternative route; therefore, it is not possible to precisely determine the number of individuals or the amount of habitat that may be affected by the Project. Detailed engineering design is needed to determine the exact number of individuals or extent of habitat affected. Preconstruction surveys would be conducted on the selected route in agency-designated habitat areas using agency-approved protocols (Design Feature 3) to locate previously unrecorded populations of all

special status species considered in this analysis. Detailed engineering design and the results of preconstruction surveys would be used to inform application of selective mitigation measures including avoidance of special status plants to the extent practicable. Impacts on clay reed-mustard and Uinta Basin hookless cactus from this alternative route could be mitigated if the Project crossing of the Green River were relocated north of the Fourmile Bottom crossing area identified in the BLM Vernal RMP, but a plan amendment would be required (Table 5-21).

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to vegetation resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Vegetation and Special Status Plants Resource Report which is available for review and download from the Project website. The analysis found that Alternative COUT-I could be approved in compliance with standards, guidelines, and management objectives pertaining to vegetation resources contained in applicable USFS LRMPs.

3.2.6.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A (MV-7) would be located on the Wyoming/Colorado state line. In Wyoming, the Powder Wash series compensation station would be located in an area with small areas of habitat for Ute ladies'-tresses.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses habitat from the Powder Wash series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-71).

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B (MV-7) would be located where Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 diverge in Nine Mile Basin in Colorado. The Nine Mile Basin series compensation station would be located in an area with small areas of habitat for Ute ladies'-tresses.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses habitat from the Nine Mile Basin series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-71).

Siting Area C – Maybell

Affected Environment

Siting Area C (MV-7) would be located where Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 diverge in the Tuttle Ranch Conservation Easement area. The Maybell Siting Area would be located in an area with small areas of habitat for Ute ladies'-tresses.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses habitat from the Maybell series compensation station is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-71).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D (MV-7) would be located in sagebrush, shrub/shrub steppe and pinyon-juniper vegetation communities just south of U.S. Highway 40, west of Craig. Siting Area D would be located in an area with small areas of habitat for Ute ladies'-tresses.

Environmental Consequences

The estimated area of disturbance (in acres) Ute ladies'-tresses habitat from the Siting Area D is included in the disturbance analysis for Alternative WYCO-B, and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Table 3-74).

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G (MV-7) would be located in an area previously disturbed by the I-70 corridor and U.S. Highway 6; approximately 5 miles west of the Green River. Siting Area G would be located in an area with small areas of habitat for Ute ladies'-tresses.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses habitat from the Green River series compensation station is included in the disturbance analysis for Alternative COUT BAX-B (Table 3-74).

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F (MV-7) would be located in an area previously disturbed by agriculture and U.S. Highway 40 in the vicinity of Roosevelt. Siting Area F would be located in an area with small areas of habitat for Ute ladies'-tresses and Uinta Basin hookless cactus.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses and Uinta Basin hookless cactus habitat from the Roosevelt series compensation station is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1 (Table 3-77).

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E (MV-7) would be located in an area previously disturbed by oil and gas development, and the Bonanza Power Plant. Siting Area E would be located in an area with small areas of habitat for Ute ladies'-tresses and Uinta Basin hookless cactus as well as both 1,000-m and 400-m *Sclerocactus* core areas.

Environmental Consequences

The estimated area of disturbance (in acres) to Ute ladies'-tresses and Uinta Basin hookless cactus habitat and Levels 1 and 2 *Sclerocactus* core areas from the Bonanza series compensation station is included in the disturbance analysis for Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 (Table 3-77).

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.7 Wildlife

3.2.7.1 Introduction and Regulatory Framework

This section discusses potential impacts on wildlife resources, including some species that are USFS MIS, by implementing the Project. Wildlife resources discussed in the section include birds, mammals, and reptiles, that are not designated as threatened, endangered, or candidates for listing under the ESA, species listed as sensitive by the USFS, BLM, or states; or sensitive species that are also designated as MIS affected by the Project. Detailed analysis of potential effects on MIS, including forest plan consistency determinations are contained in USFS Specialist Reports (USFS 2013c). Analysis of potential effects on special status wildlife species is contained in Section 3.2.8; analysis of potential effects on fish, amphibian, and macroinvertebrates is contained in Section 3.2.9.

3.2.7.1.1 Regulatory Framework

Implementation of the Project would be consistent with statutes, regulations, plans, programs, and policies of affiliated tribes, federal agencies, and state and local governments.

Federal

- The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712) states it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess any migratory bird, part, nest, egg or product, manufactured or not.
- The FLPMA, as amended, consolidates and articulates BLM and USFS management responsibilities and governs most uses of federal lands, including authorization to grant or renew rights-of-way. In accordance with FLPMA, BLM and USFS must make land-use decisions based on principles of multiple use and sustained yield. As such, a grant of right-of-way must be limited

to its necessary use and must contain terms and conditions that reflect the agencies' management responsibilities under FLPMA, including minimizing impacts on fish and wildlife habitat.

- The URMCC is authorized under the CUP Completion Act of 1992 (P.L. 102-575) to set terms and conditions for completing the CUP, which diverts, stores and delivers large quantities of water from numerous Utah rivers. The URMCC is responsible for designing, funding and implementing projects to offset the impacts on fish, wildlife and related recreational resources caused by CUP and other federal reclamation projects in Utah. Lands owned and managed by the URMCC for CUP mitigation commitments are located in the Project area.
- The NFMA, as amended, and its implementing regulations under 36 CFR 219, consolidate and articulate USFS management responsibilities for lands and resources of the National Forest System. The NFMA requires each national forest develop a management program based on multiple-use, sustained-yield principles and implement a land-management plan for each unit of the National Forest System. The implementing regulations at the time the current forest plans were approved required the identification of MIS (36 CFR 219.19). MIS were selected because their population changes were believed to indicate the effects of management activities on habitats of other species of selected major biological communities or water quality. The land-management plans established objectives for the maintenance and improvement of habitat for the MIS.
- The BLM WO-IB 2012-097 states current BLM policy for any cutting or removal of timber, trees, or vegetative resources, including such resources located within the clearing limits of rights-of-way.
- The BLM Utah IM-2005-091 provides the Utah BLM Riparian Management Policy aimed at identifying, maintaining, restoring, and/or improving riparian values to achieve a healthy and productive ecological condition for maximum long-term benefits and overall watershed protection while allowing for reasonable resource uses.
- Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs federal agencies to take certain actions to further implement the MBTA (16 U.S.C. 703-711). The federal agencies are directed to develop and implement a Memorandum of Understanding with the FWS to promote conservation of migratory bird populations.
    - *Forest Service Agreement # 08-MU-1113-2400-264 Memorandum of Understanding Between the U.S. Department of Agriculture Forest Service and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds* identifies specific activities where cooperation between these parties will contribute to the conservation of migratory birds and their habitats.
    - The *BLM Memorandum of Understanding Between the Bureau of Land Management and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds* outlines a collaborative approach to promote the conservation of migratory bird populations and is intended to strengthen migratory bird conservation efforts by identifying and implementing strategies to promote conservation and reduce or eliminate adverse impacts on migratory birds through enhanced collaboration between the BLM and the FWS in coordination with state, tribal, and local governments.
- Executive Order 13112 (*Invasive Species*) requires that federal agencies prevent the introduction and spread of invasive species and prohibits their authorization of actions that would be likely to cause or promote the introduction or spread of invasive species.
- BLM RMPs and Management Framework Plans for Wyoming, including Rawlins (2008) for Colorado, including White River (1997, as amended), Little Snake (1989, as amended), and Grand Junction (1987, as amended) Field Offices; for Utah, including Richfield (2008), Fillmore (1987), Moab (2008), Price (2008) and Vernal (2008) Field Offices, and Salt Lake District

(1990), specify regulations and goals for management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend.

State

Wyoming

- The Wyoming State Wildlife Action Plan (SWAPs), 2005 and revised in 2010, is a coordinated, comprehensive conservation strategy designed to maintain the health and diversity of wildlife, including species with low and declining populations within Wyoming.
- Wyoming State Code Section 23-1-101 defines wildlife as all wild mammals, birds, fish, amphibians, reptiles, crustaceans, and mollusks, designated by the Wyoming Game and Fish Commission and the Wyoming Livestock Board in state.
- Wyoming State Code Section 23-1-103 establishes that all wildlife is the property of the state of Wyoming and directs the control, propagation, management, protection and regulation of wildlife in Wyoming.
- Wyoming State Code Section 23-1-302 empowers the Wyoming Game and Fish Commission to manage big game hunting seasons, take, and areas in Wyoming and to develop, improve, and maintain lands and waters for the management and protection of all wildlife.
- Wyoming State Code Section 23-3-108 states it is a violation to take or intentionally destroy the nest or eggs of any nonpredacious bird in Wyoming.
- Wyoming State Code Section 23-3-101 prohibits the take of eagles.
- Wyoming State Code Section 23-3-102 prohibits the take of any big or trophy game animal or gray wolf where classified as a trophy game animal without the proper license or authority.
- Wyoming State Code Section 23-3-103 prohibits the take of any furbearing animal or game bird without the appropriate license in Wyoming.

Colorado

- The Colorado SWAP published in 2006 is a comprehensive management strategy developed by Colorado Parks and Wildlife (CPW; formerly known as Colorado Division of Wildlife [CDOW]) and the State of Colorado to conserve native species populations and habitats and prevent additional federal listings.
- Colorado State Code Statute 33-2-101 describes the State's intent to protect wildlife within Colorado under the Nongame, Endangered, or Threatened Species Conservation Act.
- Colorado State Code Statute 33-2-104 regulates the take, possession, transportation, exportation, processing, sale or offering for sale, or shipment of nongame wildlife as may be deemed necessary to manage nongame species within Colorado.

Utah

- The Utah SWAP 2005 is a comprehensive management plan designed to conserve native species populations and habitats within Utah, and prevent the need for additional federal listings.
- Utah State Code Section 23-14-1 directs the UDWR to protect, propagate, manage, conserve, and distribute protected wildlife throughout Utah. This statute also authorizes UDWR to identify and delineate crucial seasonal wildlife habitats.

- Utah Partners in Flight (PIF) Avian Conservation Strategy, Version 2.0, prioritizes avian species and their habitats and sets objectives designed to determine which species are most in need of immediate and continuing conservation effort. The other purpose of the strategy is to recommend appropriate conservation actions required to accomplish stated objectives.

3.2.7.2 Issues Identified for Analysis

Issues concerning wildlife species, including MIS, were identified through coordination and in cooperation with BLM, USFS and FWS resource specialists, state wildlife agencies, conservation groups and trusts, and members of the public during the scoping process. Issues considered for analyses in the EIS are presented in Table 3-78.

TABLE 3-78
WILDLIFE ISSUES IDENTIFIED FOR ANALYSIS

Issue Identified	Analysis Considerations
Birds	
Impacts on migratory birds, including waterfowl: ▪ U.S. Fish and Wildlife Service birds of conservation concern ▪ Partners in Flight priority species for Wyoming, Colorado, and Utah ▪ potential mortality due to collisions and electrocution	▪ Estimate loss and degradation of potentially suitable habitat types in the Project area ▪ Qualitatively assess potential risk of migratory bird and waterfowl collision and electrocution due to Project ▪ Qualitatively assess potential disturbance to foraging and nesting habitat
Impacts on sagebrush obligate birds	▪ Estimate loss and degradation of sagebrush habitat within Project area ▪ Qualitatively assess potential disturbance to foraging and nesting habitat
Impacts on upland game birds including chukar, pheasant, dusky and ruffed grouse, quail	▪ Estimate loss and degradation of potentially suitable habitats for upland game birds within Project area ▪ Qualitatively assess potential disturbance to foraging and nesting habitat
Big Game	
Impacts on big game species, including Management Indicator Species: ▪ pronghorn ▪ mule deer ▪ elk ▪ moose ▪ bighorn sheep (Rocky Mountain and desert subspecies) ▪ impacts on crucial/critical winter range and spring habitat ▪ impacts on migration corridors	▪ Estimate loss and degradation of designated crucial habitat for each species affected by the Project ▪ Estimate potential disturbance to migration corridors ▪ Qualitatively assess fragmentation of designated crucial habitats and location of migration corridors relative to crucial habitat
Mammals	
Impacts on mammals such as bats, large rodents (i.e., beaver, muskrat, marmot), meso-carnivores (i.e., bobcat, weasels, martens, and raccoons), apex predators (i.e., bear, gray wolf and mountain lion) from: ▪ temporary displacement of wildlife during construction ▪ habitat linkages and movement corridors	▪ Qualitatively assess impacts on potentially suitable foraging and breeding habitat for bats in the alternative route study corridors ▪ Qualitatively assess potential risk of mammal collision due to Project ▪ Estimate loss, degradation and fragmentation of habitat within alternative route study corridors
Reptiles	
Impacts on reptiles	Qualitatively evaluate impacts on potentially suitable habitat in the Project area

3.2.7.3 Regional Setting

The Project area falls within a number of geological formations and features that have shaped the evolution and ecology of the vegetation and wildlife communities that occur in the area. The Project area is situated in the Platte River, Colorado River, and Great Basin drainages, and encompasses parts of the Wasatch Range, the Uinta Mountains, and the Rocky Mountains. Five Level III Ecoregions (EPA 2010b) surround the Project area: Wyoming Basin, Southern Rockies, Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range. Climates across the ecoregions range from warm or hot summers of low humidity and precipitation, to cold dry or severe winters with deep snowpack. Elevations in the Project area range from approximately 3,281 to 12,238 feet above mean sea level. The diversity of vegetation communities (Section 3.2.5) reflects the climate variation and large changes in elevation in the five ecoregions. In addition, naturally occurring disturbance regimes such as wildfire can have a large influence on environmental erosion and run off in the five ecoregions (Souza 1984; World Wildlife Fund [WWF] 2006). Furthermore, anthropogenic disturbance (e.g., livestock grazing, agriculture and land development) affects environmental conditions by introducing habitat fragmentation. Factors that influence environmental conditions and habitat composition in the five ecoregions will naturally impact the wide diversity of bird, mammal, fish, reptile, amphibian, and macroinvertebrate species that inhabit them.

Wildlife habitat provided in the ecoregions by the different vegetation communities include riparian, arid and semi-arid desert shrub, grassland, and sagebrush communities at lower elevations; sagebrush steppe, pinyon-juniper and mountain shrub communities on mid-elevation slopes; mixed conifer and aspen at higher elevations; and alpine vegetation and montane forest communities at high elevations.

At low elevations riparian habitat can support a high density and diversity of resident, transient, and migratory wildlife species relative to habitat area. Sagebrush habitats are important habitats for many sagebrush obligates including a number of USFS-, BLM-, and state-sensitive wildlife (Section 3.2.8). Both habitats are identified as key habitat types and a priority for conservation actions in Swaps for Wyoming, Colorado, and Utah. Arid and semi-arid desert shrub and grasslands also provide habitat for a diverse number of birds, mammals, and reptiles, including species with limited home range and movement capabilities and those adapted to semi-arid environments of sparse vegetation and fluctuating temperatures. Adaptive mechanisms include avoiding extreme temperatures through use of cover or burrowing, or nocturnal and crepuscular activity patterns; adapting to limited food and water resources through food storage, omnivorous or generalist foraging patterns, and the ability to gain water or moisture requirements from food resources; or maximizing reproduction rates during favorable conditions (Abere and Oguzor 2011).

At mid-level elevations sagebrush steppe, pinyon-juniper, and mountain shrub provide valuable habitat, vegetation structure, and cover for many native birds, reptiles, and mammals including big game species, especially during winter (Bennetts et al. 2012). Predator-prey dynamics at low- and mid-level elevations can be closely linked, often following boom and bust cycles as a result of bottom up processes such as changes in vegetation and forage availability that directly impact prey species, or top down processes that increase predator numbers and predation rates. At higher elevations, mixed conifer, aspen, alpine vegetation, and montane communities support wide-ranging ungulates. At higher elevations however, individual and herd movement patterns are restricted by topography, climate, and seasonal access to crucial ranges (WWF 2006).

3.2.7.4 Study Methodology

3.2.7.4.1 Inventory

Background information for wildlife species was obtained from a variety of sources, including BLM and USFS land-management plans; state species accounts for Wyoming, Colorado, and Utah; scientific literature (Feldhamer et al. 2003); or downloaded from databases including (NatureServe 2012a), (WWF 2006) and International Union for Conservation of Nature (IUCN) Redlist (IUCN 2012).

Locality data for wildlife species likely to occur in the Project area were obtained from natural heritage programs (WYNDD, Colorado Natural Heritage Program [CNHP], and Utah Natural Heritage Program [UNHP]), state agencies (Wyoming Game and Fish Department [WGFD], CPW, and UDWR), resource specialists, and all BLM field offices and national forests crossed by the Project corridors. Data for big game species are described separately under Mammals (in this section). However, definitive information regarding the distribution of species and quantitative data descriptive of population size and trends are limited for many wildlife species likely to occur in the Project area. For species with limited data available for analysis, a qualitative evaluation of the potential occurrence of species in the Project area was performed. Classification of habitat in the Project area was based on vegetation communities obtained from the GAP dataset (USGS 2010b), which incorporates the Northwest Regional Gap Analysis Project and the Southwest Regional Gap Analysis Project (USGS 2010b). Habitat for species considered in this analysis includes any area that combines adequate resources and environmental conditions for occupancy, survival, and reproduction of individuals (Franklin et al. 2000).

For the purposes of evaluating Project-related impacts on wildlife species, detailed information was collected in a 2-mile-wide alternative route study corridor (1 mile on either side of the reference centerline) for each alternative route. While data inventory efforts were focused on the alternative route study corridors, statewide data were also collected to evaluate potential impacts of the Project on wide-ranging species that use seasonal habitats and migration routes in Wyoming, Colorado, and Utah.

Wildlife species likely to occur in the Project area are grouped according to bird, mammal and reptile species. Wildlife species identified as particularly sensitive to the Proposed Action (e.g., migratory species, raptors, big game) by the public or federal and state agencies during the scoping process are considered separately.

Birds

Bird species recorded in the five ecoregions crossed by the Project area include raptors, upland game birds, passerines, and waterfowl. Upland game species include chukar (*Alectoris chukar*), grouse and pheasant (*Phasianidae*), quail (*Callipepla* spp), and white-tailed ptarmigan (*Lagopus leucura*). A wide variety of passerine species are likely to be present in the Project area. Waterfowl likely to be present in the Project area include, but are not limited to, ducks and geese (*Anatidae*), herons and egrets (*Ardea* and *Egretta* spp), and grebes (*Podicipedidae*). Many bird species likely to be present in the Project area are migratory species protected under the MBTA.

The diversity of vegetation cover types and habitats present is reflected in the diversity of life history traits among birds in the Project area. Some bird species are habitat obligates, while others are likely to occur across the range of habitats in the Project area. The Project area is on the western edge of the Central Flyway (a migratory route connecting the Arctic Circle to Central and South America) and the Pacific Flyway (a migratory route connecting the North Slope of Alaska to Central and South America). Therefore, seasonal migrants are likely to use specific habitats such as riparian areas as critical rest stops and as key resources for migration survival (National Audubon Society 2012). Riparian areas also provide suitable habitats for foraging, nesting, and rearing hatchlings whose survival is dependent on the availability of aquatic plants and macroinvertebrates to make the return migratory flight (Ryder and

Manry 1994). Species composition and occurrence in any given habitat type is a function of suitable vegetation for nest success, food availability, and cover from predators (Martin 1993). Additionally, the presence and location of a small mammal and/or passerine prey base relative to suitable nesting or roosting habitat are critical factors influencing raptor occurrence in the Project area (Reynolds et al. 1992). Detailed information on special status raptor occurrence in the Project area is included in Section 3.2.8.

Data used to identify priority migratory bird species, potential avian habitat types, and migratory corridors in the Project area were obtained from FWS Birds of Conservation Concern (BCC); Bird Conservation Regions 9, 10, and 16 (FWS 2008b), and from PIF; Physiographic Areas 62, 69, 80, 86, and 87 for Wyoming (Nicholoff 2003), Colorado (Colorado Parners in Flight 2000), and Utah (Parrish et al. 2002). For a list of priority migratory species likely to occur in the Project area refer to Appendix E.

Mammals

Mammals likely to be present in the five ecoregions crossed by the Project area include small aerial species such as bat (*Vespertilionidae, Molossidae,* and *Phyllostomidae*) and terrestrial species, which include mouse and vole (*Muridae*), shrew (*Soricidae*), rat (*Dipodomys* and *Neotoma* spp), gopher (*Geomyidae*), chipmunk (*Tamius striatus*), marten and weasels (*Mustelidae*), and squirrel (*Spermophilus* and *Tamias* spp). Mid-sized mammals likely to be present include skunk (*Mephitidae*), rabbit (*Sylvilagus* spp), hare (*Lepus* spp), marmot (*Marmota* spp), beaver (*Castor canadensis*), and raccoon (*Procyon lotor*). Meso- and large-bodied carnivores likely to be present include badger (*Taxidea taxus*), fox (*Vulpes* spp), coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), and black bear (*Ursus americanus*). Ungulates include pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), moose (*Alces alces*), Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*), and desert bighorn sheep (*Ovis canadensis nelsoni*).

Life histories of mammal species vary in response to changes in environmental conditions and local habitat quality (Shefferson 2010). Population abundance naturally cycles and fluctuates as conditions change (Norrdahl 1995). In addition, mammal assemblages can be sensitive to disturbance. Arid and semi-arid desert shrub, sage-steppe, and grasslands are important habitats for small- and medium-sized mammal species. Therefore, disturbance to such habitats may be more pronounced for smaller-bodied species with limited mobility, ultimately affecting dispersal rates, diversity, and abundance of small- and medium-sized mammal populations (Hanser et al. 2011). Larger bodied species may compensate through shifts in temporal or spatial activity and movement patterns (Feldhamer et al. 2003). Abundance and distribution data of many mammal species in the Project area were limited. The availability of suitable habitat provides a proxy for potential mammal occurrence. Therefore, mammal occurrence was qualitatively assessed based on the availability of potentially suitable habitat in the Project area.

Big Game

Elk are MIS for the Ashley and Manti-La Sal National Forests. Detailed analysis of potential effects on MIS is included in the USFS Wildlife Specialist Report (USFS 2013c). Elk are habitat generalists and have increased their range throughout the Project area, largely as a result of reintroduction programs. Patterns of seasonal range use often vary according to region and vegetation. Elk are opportunistic foragers with a varied diet. Winter diet consists primarily of grasses and shrubs and summer diets include forbs. Some populations undertake seasonal migrations while others are non-migratory. Winter migrations are linked to climatic condition; like the first significant snow fall, and are undertaken to avoid seasonal shortages in forage. Limiting factors include the availability of crucial/severe winter habitat and calving areas, extreme weather (heavy snowfall and persistent cold temperatures, and extended drought), predation, legal harvest (Peek 2003), and disease (Finley and Grigg 2008).

Mule deer are MIS for the Ashley and Manti-La Sal National Forests. Detailed analysis of potential effects on MIS is included in the USFS Wildlife Specialist Report (USFS 2013c). Mule deer are found in habitats that include arid and semi-arid desert shrub to mountain temperate coniferous forests (refer to Appendix E), benefiting from a varied diet of shrubs, forbs, trees and grasses. Mule deer have small home ranges relative to those of other big game species. Populations also exhibit habitual, seasonal, and diurnal movement patterns, but can adapt to anthropogenic disturbance (Mackie et al. 2003). Limiting factors that often control mule deer populations include the availability of crucial/critical winter habitat and fawning areas, extreme weather (heavy snowfall and persistent cold temperatures, and extended drought) disease (most notably Chronic Wasting Disease in the Rocky Mountains region and mid-western states) predation, competition for forage with livestock, legal harvest, and the effects of human induced habitat alteration (Sanchez-Rojas and Gallina-Tessaro 2008).

Pronghorn are generally found in sagebrush, desert shrub, grasslands, and agricultural land. Pronghorn are selective feeders; dietary composition rarely reflects the relative availability of plants selected as forage in pronghorn habitats (Byers 2003). The size of pronghorn groups observed is generally larger in the winter before dispersal. Pronghorn form separate bachelor and female-kid groups in spring and summer, and mixed herds in late summer and early fall (Hoffmann et al. 2008). Some populations undertake seasonal movements of up to 160 kilometers from their summering area. Long-distance seasonal migrations are common, and pronghorn show high fidelity to migratory routes despite geographic barriers and bottlenecks. Migratory bottlenecks are areas where topography, vegetation, development, or other landscape features restrict animal movements to narrow or limited regions. Migration is an adaptive behavioral strategy that avoids seasonal resource shortages (Baker 1978; Sawyer et al. 2005). Limiting factors for pronghorn include the availability of crucial/severe winter habitat and fawning areas, extreme weather (heavy snowfall and cold, and extended drought), predation that can induce high rates of fawn mortality in the first 45 days to 1 year of life, and disease- and parasite-induced mortality (Byers 2003).

Bighorn sheep include the two species: Rocky Mountain bighorn sheep and Desert bighorn sheep. Rocky Mountain bighorn sheep are state sensitive for Wyoming, and USFS-sensitive for Ashley, Manti-La Sal and Uinta National Forests. Designated UDWR habitat occurs on Ashley and Uinta National Forest but is not affected by the Project. Designated habitat for the species does not occur on Manti-La Sal National Forest. Rocky Mountain bighorn sheep are found in open habitats, such as alpine meadows, open grasslands, shrub-steppe, talus slopes, rock outcrops, and cliffs. This species uses open forests in some areas for foraging and thermal cover (Beecham et al. 2007; NatureServe 2012a). Rocky Mountain bighorn sheep migrate seasonally between summer and winter ranges. Winter ranges occur in areas with low snow accumulation (Krausman and Bowyer 2003).

Desert bighorn sheep are designated as USFS- sensitive for the Manti-La Sal National Forest, and BLM-sensitive for Colorado. The desert bighorn's diet changes by habitat and season. Hall (1946) reported that fruits of the prickly pear (*Opuntia basilaris* and *O. engelmannii*) and ooze apple (banana yucca [Yucca *baccata*]) are among the most important food items. Other important foods are a variety of grasses, sagebrush (*Artemisia tridentata*), mountain mahogany (*Cercocarpus intricatus*), Mormon teas (*Ephedra* spp.), winter fat (*Krascheninnikovia lanata*), and buckwheats (*Eriogonum* spp.) (Monson and Sumner 1980). Desert bighorns do not migrate (UDWR 2008a) Freestanding water is a critical habitat element for desert bighorns, with lambs and ewes visiting watering holes almost daily during hot, dry months (Nevada Department of Wildlife 2009). In addition temperatures limit daily movement patterns and can induce heat stress (Krausman and Bowyer 2003). Limiting factors to both species of bighorn sheep include loss of crucial habitat due to development, forage competition with ungulates, extreme weather, predation and disease (Nevada Department of Wildlife 2009; UDWR 2008a).

Moose are listed as state sensitive in Wyoming. Moose have a varied diet of forbs, shrubs and grasses that varies according to season, and often overlaps dietary requirements of other ungulates. In addition, shrub

composition is important for calf hiding sites, which may be more important for survival than calving areas (Peek 2003). Moose habitat includes mixed conifer forests for winter cover and riparian areas for foraging (refer to Appendix E). Not all moose populations undertake seasonal migrations, and time of migration often differs for males and females with calves. Movement to upper elevations in the summer is driven by forage availability, while movement onto winter range and to lower elevations corresponds with the first snowstorms (Peek 2003). Home range size and population density vary according to geographic region and vegetation. Sexes tend to occupy separate areas within the range except during breeding season, and social aggregations tend to be short term (Peek 2003). The UDWR state that limiting factors for moose include availability of crucial habitat (UDWR 2009a) competition for forage, changes in herd sex ratios in hunted populations that affects calf production (Peek 2003), predation, extreme weather conditions, and disease (NatureServe 2012a).

Big game populations are managed by state wildlife agencies in Wyoming, Colorado, and Utah. Designated big game habitat in the three states includes habitat that is a limiting factor in population long-term survival, which comprises of crucial, severe and critical habitat. Crucial habitat is defined by UDWR as habitat on which the local population depends for survival; degradation or unavailability of crucial habitat can lead to significant declines in carrying capacity and/or numbers of a species. Crucial summer, crucial winter and crucial year-long are designated habitats in Wyoming and Utah; crucial spring/fall and crucial winter/spring are designated habitat in Utah only. Summer concentration (elk), critical winter (mule deer) and severe winter (pronghorn) are designated big game habitats in Colorado that are equivalent in value to crucial habitat in Wyoming and Utah. Mapped migration corridors are designated in Wyoming and Colorado only.

Designated big game habitat in Wyoming, Colorado, and Utah also includes nonlimiting range. The UDWR defines substantial habitat as habitat that is used by a wildlife species but is not crucial for population survival; and degradation or unavailability of substantial value habitat will not lead to significant declines in carrying capacity and/or numbers of the wildlife species in question. Nonlimiting big game habitat in Wyoming includes winter, winter year-long, year-long and spring/summer/fall range. Nonlimiting big game habitat in Colorado includes winter concentration areas and winter range.

The name of designated big game habitat varies by state. Data used to analyze the level of Project impacts on big game habitat and migration corridors were obtained from WGFD, CPW, and UDWR. When provided as line files, migration corridors for elk, mule deer, and pronghorn were buffered by 0.25 mile on either side. Bighorn sheep production range and winter range were obtained from CPW (2012a, b); bighorn seasonal range boundaries were obtained from UDWR (UDWR 2006a) and WGFD (WGFD 2011a). Desert bighorn sheep seasonal range was obtained from UDWR (UDWR 2008a). Elk seasonal range boundaries (WGFD 2011b) and migration corridors (WGFD 2008) were obtained from WGFD; winter concentration areas, summer concentration areas, severe winter range, production areas, and migration corridors were obtained from CPW (CPW 2012c); seasonal range boundaries were obtained from UDWR (UDWR 2007a). Mule deer seasonal range boundaries (WGFD 2010a) and migration corridors (WGFD 2008) were obtained from WGFD; severe winter range (elk and pronghorn), critical winter range (mule deer) and migration corridors were obtained from CPW (CPW 2012c, d, e); and seasonal range boundaries were obtained from UDWR (UDWR 2007b). Moose seasonal range boundaries were obtained from WGFD (WGFD 2011c) and from UDWR (UDWR 2006b). Pronghorn seasonal range boundaries (WGFD 2010a) and migration corridors (WGFD 2008) were obtained from WGFD; winter concentration, severe winter range, and migration corridors were obtained from CPW (CPW 2012e); and summer and year-long habitats were obtained from UDWR (UDWR 2010a).

Reptiles

Reptiles likely to occur in a wide range of habitats in the Project area include fence lizard (*Scleroporus undulatus*), garter snake (*Thamnophis elegans*), and Great Basin gopher snake (*Pituophis catenifer deserticola*). Reptile species limited to sagebrush desert habitat also are likely to be present, and include northern sagebrush lizard (*Sceloporus graciosus*), desert-horned lizard (*Phrynosoma platyrhinos*), and longnose leopard lizard (*Gambelia wislizenii*).

Life history traits of many reptile species are closely linked to abiotic and biotic conditions. Activity patterns and dispersal rates are driven by relative humidity and climate regimes, and microclimates in larger habitat types (e.g., solar heated rocky outcroppings in sagebrush ecosystems) are used for basking and thermoregulation (Grant and Dunham 1988; Stebbins 2003). Species diversity and occurrence across arid and semi-arid sagebrush habitats is highly dependent on the effectiveness of a given habitat in providing cover from predators and open 'inter-shrub' space for movement and reduction in predator detection between refuges (Newbold 2005; Stebbins 2003; Vitt and Pianka 1994). Limited data were available for reptile species distribution in the Project area. The availability of suitable habitat provides a proxy for potential reptile occurrence. Therefore, reptile occurrence was qualitatively assessed based on the availability of potentially suitable habitat in the Project area.

Biological Resource Conservation Areas

State wildlife management, habitat management areas, and wildlife areas in Wyoming, Colorado, and Utah are managed by federal, state, or a combination of both state and federal governmental agencies and are areas designated to manage and protect habitats for key wildlife resources. Conservation areas that occur in part or in their entirety in the Project area are discussed in Section 3.2.13.

3.2.7.4.2 Temporal and Geographic Scope of Analysis

The temporal scope of analysis for the Project includes short- and long-term impacts on biological resources. Short-term impacts include temporary impacts on biological resources that result from Project construction and maintenance. Short-term impacts are expected to dissipate in 5 years from Project construction as a result of reclamation activities associated with the Project, and reduced human presence after completion of construction. Long-term impacts include permanent impacts on biological resources that begin during Project construction, but persist through the life of the Project (i.e., associated with the presence of the transmission line and access roads).

The geographic scope of analysis encompasses the scope of direct and indirect effects of the proposed alternative routes on the natural boundaries of biological resources. The geographic scope of analysis for wildlife resources was the 2-mile-wide study corridor (1 mile on either side of the reference centerline) for each route. For big game, the geographic scope of analysis was designated crucial habitat within herd management units in Wyoming, Colorado and Utah that are crossed by the 2-mile-wide study corridor.

3.2.7.4.3 Impact Assessment and Mitigation Planning

The methodology used to assess potential impacts on wildlife resources for the purpose of interdisciplinary comparison of alternative routes included (1) identifying the types of potential effects on wildlife resources that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) assessing the level of initial impacts on wildlife resources present in the alternative route study corridors (3), identifying appropriate selective mitigation measures (Table 2-13) for minimizing some potential adverse effects and determining specific areas where selective mitigation measures should be applied, and (4) disclosing the level of potential residual impacts on wildlife resources (i.e., impacts anticipated after application of selective mitigation measures). Design

features of the Proposed Action for environmental protection (Table 2-8) were considered when assessing both initial and residual impacts on all resources. Additional discussion of the methods used in analyzing effects of the Project on wildlife resources to support interdisciplinary comparison of alternative routes are discussed in the Effects Analysis section.

Supplemental analyses were necessary to address some of the issues raised by the public and the agencies during scoping. Quantitative or qualitative analyses were performed, depending on information available to evaluate potential impacts of the Project on wildlife resources or to meet the requirements of relevant law, regulation, or policy. The methods for these supplemental analyses are discussed in the Effects Analysis section.

Types of Potential Effects

The construction, operation, and maintenance of the Project would result in both direct and indirect effects on wildlife. Direct effects are effects caused by the action and occur at the same time and place (40 CFR 1508.8(a)). Indirect effects are effects caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8(b)). Direct and indirect effects encompass short- and long-term impacts.

The type of potential effect experienced by each wildlife species would depend on species-specific sensitivity to activities related to the construction, operation, and maintenance of the Project. Potential direct and indirect effects of project construction, operation and maintenance on wildlife species, and/or their habitat were identified through a review of scientific literature and databases such as NatureServe (2012b), WWF Wildfinder (2006) and IUCN Redlist (2012)

Birds

Direct Effects

Direct effects on bird habitat include removal, alteration, fragmentation, and damage of vegetation during construction of Project access roads, transmission line towers, and all associated facilities. Clearance of right-of-way vegetation may result in an abrupt contrast in adjacent vegetation communities through the loss of ground cover, reduction in height and vigor of vegetation, loss and damage of trees and shrubs (Section 3.2.5). Species composition and occurrence of birds in any given habitat type is a function of suitable vegetation for nesting, food availability, and cover from predators (Martin 1993). Activities related to Project construction could result in a loss and degradation of foraging and nesting habitat and cover for sagebrush obligate species, upland game birds, migratory birds, and waterfowl. Displacement of individuals as a result of habitat loss or degradation may occur, particularly in ground-nesting and sagebrush-obligate species. Additionally, disturbance and interruption of breeding, nesting, and brood-rearing may occur as a result of increased noise, human presence, and construction activities. Short-term and long-term effects of habitat loss, alteration, and fragmentation on birds are likely to be a function of the scale of habitat change and each species life-history characteristics (Schmiegelow and Monkkonen 2002).

Mortality of migratory birds may occur through crushing of nests, eggs, or nestlings by equipment used during project construction and vegetation clearance and selective tree removal. Trees and other vegetation would be removed selectively (e.g., edge feathering), and trees more than 12 feet tall would be removed selectively in riparian and tree nesting habitats. Direct impacts on migratory birds would be reduced, however, by conducting migratory bird and nest surveys prior to any vegetation-disturbing

activities. The direct impacts would also be reduced by avoiding vegetation clearing and construction and maintenance activities during migratory bird nesting season (Design Features 6 and 7).

Mortality also may occur due to collision with vehicles on Project access roads or from increased use of highways by Project personnel during construction. Risk of mortality from vehicle collisions can increase where roads are located close to bird concentration areas, such as wetlands (Erickson et al. 2005), at lower elevations, or in open areas (Kociolek et al. 2010). Collision risk may be a function of life-history characteristics. Birds at greater risk from vehicle collisions include passerines and waterfowl (Erickson et al. 2005); ground nesters, corvids, raptors, and frugivores that may be attracted to roads and adjacent areas for foraging, hunting, or nesting (Jacobson 2005). Risk also may increase according to seasonal movement patterns such as during migration (Kociolek et al. 2010). The speed of vehicles can affect the number of wildlife collisions on roads, with lower speeds effectively reducing collision rate by increasing the reaction time of both driver and wildlife (Jaarsma et al 2006). Reducing vehicle speed on access roads to 15 mph would be implemented to reduce bird mortality risk from vehicle collisions (Design Feature 39).

Similarly, risk of mortality and injury to birds from in-flight collisions with Project equipment such as guy wires and structures is likely to be species specific (Faanes 1987). Probability of collision with transmission lines has been linked to bird morphology (body size, weight, wing shape), age, and behavior (flocking, nesting, courtship, foraging, flight ability and altitude) (APLIC 2006, 2012; Janss 2000).Risk of collision also increases according to the number of times birds cross transmission lines, or in species with low flight maneuverability, and in locations where power lines cross bird landing or take-off paths (Janss 2000). Research shows avian/transmission line collisions can be significantly reduced by applying flight diverters at locations where collision risk is elevated (Savereno et al. 1996).

Bird electrocutions on power lines have been documented, and may be a function of size, habitat, prey, behavior, age, season and weather (APLIC 2006). Large body size is considered a primary factor in determining species electrocution risk, as is the use of transmission line structures for perching or nesting. Raptors and large waterbirds are therefore at greater potential risk (APLIC 2006). However, mortality by electrocution from the proposed 500kV transmission lines is extremely low as the transmission line would be constructed using avian-safe transmission line design that includes a stipulated distance between energized and ground equipment (Design Feature 4). The separation distance between energized and grounded equipment would be much greater than a wrist-to-wrist or head-to-foot measurement of any bird present in the Project area, and larger than the recommended distance of greater than 60 inches to prevent avian electrocutions (APLIC 2006).

Electrocution of birds may be possible at substations and series compensation stations, where the distance between energized and grounded equipment sometimes reduced. However, substations are not proposed for the Project and series compensation stations are not typically used by birds for foraging or nesting habitat. Vegetation is cleared within the boundaries of substations resulting in low prey availability for predatory bird species and little substrate available for nest construction. Additionally, energized equipment in series compensation stations produces audible noise that presumably deters nesting in series compensation stations. Series compensation stations would incorporate avian protections in accordance with the applicant's standards to reduce Project-related impacts on birds (Design Feature 4).

Indirect Effects

Fragmentation of avian habitat may increase edge effects that can alter habitat microclimates and species interactions, bird assemblages and diversity, bird densities at habitat edges, nest predation rates, and brood parasitism (Schmiegelow and Monkkonen 2002; Yahner et al. 2002). Changes to plant communities in a given habitat could occur indirectly as a result of Project construction and maintenance. The abundance of bird species that readily adapt to habitat disturbance or that favor early successional

habitat may increase on the right-of-way compared to birds that depend on native vegetation structure for nesting (Yahner et al. 2002, Dobkin and Sauder 2004). Furthermore, the inadvertent introduction of invasive weed species could affect fire regimes and habitat microclimate (Section 3.2.5).

Construction of new access roads could increase human access and recreational activities (Knick et al. 2003) and indirectly increase potential hunting or poaching pressures (Bromley 1985). Disturbance and interruption of breeding, nesting, and brood-rearing as a result of increased human presence and noise construction activities can indirectly reduce fitness, survival, and reproductive performance of some individuals (Riffell et al. 1996). Research shows that in Wyoming density of sagebrush-obligate birds decline in proximity to access roads (Knick et al. 2003).

Raptors

Direct Effects

Direct effects on special status raptors include ground disturbance to raptor habitat and disruption of raptor behavior and active raptor nest sites during the breeding season from Project construction and ongoing maintenance activities. Human disturbance and increased noise levels due to construction activities near active raptor nest sites can result in nest abandonment, interference of nestling feeding, decreased nestling and egg survival due to overheating, chilling, and desiccation; increased predation and decreased breeding success (Richardson and Miller 1997; Romin and Muck 2002). Raptor species specific responses to human disturbance vary among species as well as individual mated pairs of birds. Raptor response to noise disturbance may vary from flushing, remaining on the nest, to approaching the disturbance (Larkin et al. 1996).

Risk for raptor mortality due to collisions or electrocutions would be the same as the risk described for migratory birds.

Indirect Effects

Construction of transmission line towers could increase perch availability in habitats where perches are otherwise limited. Consequently, some raptor species may be more abundant along transmission line rights-of-way than in surrounding habitat (APLIC 2006; Knight and Kawashima 1993). An increase in perch availability may increase hunting pressure and predation rates, and adversely impact local prey populations.

Transmission line towers may also increase raptor nest site availability, and alter raptor distribution on the landscape. Steenhof et al. (1993) found that 133 pairs of raptors and ravens (*Corvus corax L.*) nested along a 500kV transmission line in Idaho in 11 years of initial construction, and 82 percent of pairs nested on the power line during successive years. Ferruginous hawks (*Buteo regalis*), red-tailed hawks (*B. jamaicensis*) and great horned owls (*Bubo virginianus*) are known to nest on transmission towers (Gilmer and Wiehe 1977). Ferruginous hawks were the most common raptor nesting in the towers. Great horned owls were observed using abandoned ferruginous nests in the following breeding season (Gilmer and Wiehe 1977).

It is difficult to determine whether nesting raptors benefit from an increase in nest site availability as a result of transmission tower construction. For example, continuous, long-term electric and magnetic field (EMF) exposure can affect reproductive success of species such as the American kestrel (*Falco sparverius*); increasing fertility, egg size, embryonic development, and fledging success, but reducing hatching success (Fernie et al. 2000; Fernie and Reynolds 2005). Furthermore, species such as ferruginous hawks can increase nesting and fledgling success in artificial nest sites compared to natural sites (Tigner et al. 1996). However, the probability of nesting on transmission towers may vary depending on different tower design. Consequently, success rates of mated raptor pairs may be influenced by

additional factors over and beyond increased nesting structure availability, such as severe weather conditions, substrate availability and experience in nest building behavior (Gilmer and Wiehe 1977).

Raptors and other migratory birds could be affected by human disturbance over the long term, including potential increases in recreational activities; and an increase in hunting pressure and illegal harvest as a result of new access roads in raptor habitat that would facilitate motorized access to these areas (Ellis et al. 1969).

Mammals

Direct Effects

Habitat loss, degradation and fragmentation due to construction of permanent access roads and facilities associated with the Project are likely to impact mammal species, particularly in sensitive habitat such as arid and semi-arid desert shrub, sage-steppe, and grasslands (Section 3.2.5). Habitat quality is the ability of an environment to provide conditions that increase individual and/or population survival and reproductive performance (Franklin et al. 2000). Habitat degradation is a decrease in the quality of habitat due to human activities (Groom 2006). Habitat fragmentation is a reduction in area of a specific habitat type, and change in configuration into progressively smaller and more isolated habitat patches (Noss et al. 2006). Habitat loss, degradation, and fragmentation increase habitat patch isolation; reduce potential connectivity between patches and sub-populations; and impact dispersal rates, diversity, and abundance in mammal species (Hanser et al. 2011; Noss et al. 2006). Short- and long-term impacts on small- and medium-sized mammal species, particularly with limited mobility, include loss of cover, foraging and reproductive habitat, which can adversely influence population size (Andrén 1994).

Disruption to species behavioral patterns and displacement of wildlife could occur during Project construction. However, movement of small- and medium-sized species is likely to be restricted (i.e., by limited availability of alternative quality habitat in proximity to occupied habitat affected by the Project). For displaced territorial species, movement patterns and alternative habitat could be restricted by adjacent defended territories (Feldhamer et al. 2003). Wide-ranging species may shift temporal or spatial activity and movement patterns in response to construction noise and the presence of humans and construction equipment (Feldhamer et al. 2003).

Mortality or injury to mammals could occur during construction and maintenance of the Project. The probability of mortality or injury of wildlife is likely to be a function of species life history and physiological traits. Small species could be crushed by Project equipment through either the crushing of burrows or of vegetation used as cover. Mortality and injury also could occur as a result of collision with moving construction equipment using access roads associated with the Project. The speed of vehicles can affect the number of wildlife collisions on roads with lower speeds, effectively reducing the collision rate by increasing the reaction time of both driver and animal (Jaarsma et al 2006). Reducing vehicle speed on access roads would be implemented to reduce mortality risk from vehicle collisions (Design Feature 39).

Indirect Effects

For a discussion of indirect effects on wildlife habitat that may occur due to weed introduction and modification of fire regimes refer to Section 3.2.5. Fragmentation of wildlife habitat and edge effects caused by clearance of right-of-way vegetation alters microclimate, mammal assemblages, and biotic interactions (e.g., predator-prey dynamics, parasitism, competition, and herbivory) (Willyard et al. 2004). Habitat fragmentation provides conditions favored by habitat generalists and species that readily adapt to anthropogenic disturbance. Increased rates of predation and parasitism are often correlated with changes in wildlife assemblages due to disturbance, while competition between mammal and avian predators can increase, which can increase pressure on prey populations and abundance (Willyard et al. 2004).

Alteration of wildlife movement and activity patterns could occur over the short and long term as a function of habitat disturbance. For example, generalist predators may alter movement by using habitat edges along the right-of-way to travel and hunt previously inaccessible prey sources, known as the funnel effect. In addition, an increase in perch availability could attract raptors to the transmission line rights-of-way (APLIC 2006), which could increase predation pressures on prey species (Knight and Kawashima 1993). Prior to reclamation efforts, prey species movement may be restricted by the right-of-way, as vegetation clearance can represent unsuitable habitat for species that need cover. However, crossing the right-of-way between suitable habitat patches is likely to be species-specific and subject to seasonal differences in animal-movement patterns, among other factors (Willyard et al. 2004).

Construction of new access roads could increase human access and recreational activities (Knick et al. 2003) and increase potential hunting or poaching pressure (Bromley 1985) over the long term, which could affect wildlife. Impacts on wildlife as a result of increased recreational activities include displacement and avoidance of roads, changes in habitat use, and disturbance to breeding and wintering areas at critical periods (Gaines et al. 2003). Such impacts can reduce reproductive rates and adversely impact survival and fitness (Leung and Marion 2000).

Big Game

Direct Effects

Effects on big game (i.e., mule deer, elk, and pronghorn) could include temporary displacement from seasonal habitats that provide forage, cover, water and space into less suitable habitats. Disruption to species behavioral patterns and an increase in physiological stress from construction noise and activity or routine inspections and maintenance activities also could occur. In addition, big game could experience changes to browse quality and quantity as a result of removal of native vegetation during Project construction.

Indirect Effects

Response to disturbed right-of-way sites differs between big game species. Activity of big game species in the right-of-way can be low compared to adjacent habitat, while the tendency for animals to cross a right-of-way can be a function of species response to disturbance (Sopuk and Vernam 1985) as well as right-of-way characteristics such as width (Willyard et al. 2004).

Large ungulates can be attracted to right-of-ways by increased forage potential (Willyard et al. 2004), potentially due to vegetation reclamation efforts. Travel patterns of wide-ranging carnivores also can be positively influenced by roads and trails (Paquet and Carbyn 2003). Therefore rates of predation could increase as a result of behavioral response to Project features. Access roads may facilitate increased hunting and poaching pressures on big game (Gaines et al. 2003).

Increased development may further increase pressure on migration routes by narrowing the width of geographical bottlenecks. Intraspecies and interspecies transfer of disease and pathogens may occur indirectly as a result of alteration of movement patterns and proximity of individuals (Willyard et al. 2004).

Recreational disturbance resulting from an increase in access roads could affect wide-ranging carnivores and ungulates. Wildlife response to disturbance include avoidance of roads, trails, and human activity (Gaines et al. 2003), although response varies according to species and recreation type (MacArthur et al. 1982; Stankowich 2008). In addition, flight response to disturbance may differ according to sex; female ungulates, particularly those with young show greater flight distance response, and hunted populations showed significantly greater flight responses than nonhunted populations (Stankowich 2008).

Reptiles

Direct Effects

Degradation and fragmentation of suitable habitats through removal of native vegetative cover could occur during Project construction. Microclimates in larger habitat types (burrows, vegetative cover, and rock crevices) used by reptile species could be removed or disturbed during Project construction. Mortality rates are likely to be a function of a species' life history and physiological traits and could increase during project construction and maintenance, either directly through being crushed or through compaction of burrows and vegetative cover.

Indirect Effects

Indirect effects of Project construction and maintenance include alteration of native vegetation and potential introduction and spread of weeds, which can affect the effectiveness of a given habitat in providing cover from avian and terrestrial predators. Alteration of plant assemblages may affect open intershrub space, which reptiles use for movement and refuges (Newbold 2005; Stebbins 2003; Vitt and Pianka 1994).

Predation of reptile species by raptors could increase due to use of transmission structures as perches in habitats with otherwise limited perching opportunities for raptors. These impacts may cause degradation and abandonment of wildlife habitat and alteration of predator-prey relationships in the Project area.

Mitigation Planning and Effectiveness

In addition to the design features of the Proposed Action for environmental protection, selective mitigation measures would be applied where feasible to reduce potential high and moderate adverse impacts on biological resources. Once an alternative route is selected, the Applicant would coordinate with the BLM and other land-management agencies or landowners, as appropriate, to refine the implementation of mitigation at specific locations or areas. Design features of the Proposed Action effective at reducing impacts on wildlife resources include Design Features 4, 6, 7, 8, 26, 27, 28, 30, and 39. Their effectiveness is described in this section. In addition to listed design features, selective mitigation measures also could be applied to reduce potential effects on wildlife resources.

- **Design Feature 4 (avian-safe design standards)**. All new or rebuilt transmission facilities are constructed to avian-safe design standards (i.e., *Suggested Practices for Avian Protection on Power Lines; The State of the Art in 2006* [APLIC 2006]; *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* [APLIC 2012]; PacifiCorp's Avian Protection Plan, updated June 2011 [PacifiCorp 2011]). This design feature would limit the potential for avian collision, and reduce potential for avian injury and mortality. Mortality from electrocution is unlikely as the distance between conductors and the distance between energized conductors and grounded equipment is built to APLIC standards for high-voltage transmission lines (500kV and 345kV) and is greater than the wingspan of all avian species likely to occur in the Project area.
- **Design Feature 6 (seasonal restrictions for nesting migratory birds)**. Avoiding vegetation clearing and other construction and maintenance activities would limit effects on areas with nesting birds during the migratory bird nesting season, between February 1 and August 31; however, dates may vary depending on species, current environmental conditions, results of preconstruction surveys, and approval by agency biologists or agency-approved environmental inspectors in coordination with agency biologists. This design feature would restrict human activity to avoid disturbing migratory bird nests during species specific breeding seasons.
- **Design Feature 7 (breeding bird and nest surveys)**. In the event that vegetation clearing and other construction and maintenance activities do not avoid the nesting season for migratory birds

(between February 1 and August 31), surveys for active migratory bird nests would be performed and a spatial nest buffer would be placed around each active nest until such time as the status of the nest is determined through monitoring to be no longer occupied. Based on the best available scientific information, appropriate spatial nest buffers (by species or guild), nest monitoring requirements would be identified through coordination with the FWS and other appropriate agencies and would be provided in a nest management plan in the POD. This design feature would minimize construction-related disturbance to avoid nesting migratory birds during the nesting season by determining active nest locations within 7 days of ground-disturbing activities and avoiding these areas.

- **Design Feature 8 (raptor protection restrictions).** FWS and BLM guidelines for raptor protection during the breeding season (Refer to Appendix E, Tables E-12 through E-14) will be followed including seasonal and spatial buffers around active nests, eagle roosts, and winter concentration areas. This design feature will limit Project-related spatial and temporal disturbance to raptors during sensitive life-cycle periods to avoid human disturbance and increased noise levels in the vicinity of active nest sites and limit the potential for nest abandonment or a decrease in nest success. Exceptions to temporal and spatial buffer restrictions could be granted by the appropriate agencies when determined to be appropriate by a qualified biologist and approved by the Authorized Officer.
- **Design Feature 26 (vehicle access restriction)**. All construction vehicle movement would be restricted to predesignated access roads. Exceptions would be granted for use of existing roads (e.g., interstate and state highways, well-maintained county roads), where construction traffic would be consistent with existing use and traffic volumes on roadways. This design feature would minimize disturbance to wildlife habitat and populations by limiting vehicular access and minimize risk of noxious weed introduction and the potential for subsequent changes to natural wildfire regimes as a result of alterations in plant assemblages that can increase the frequency and intensity of fire.
- **Design Feature 27 (construction activity access restriction)**. All construction vehicle movement would be predetermined, and activities would be spatially limited. This design feature would minimize disturbance to wildlife and their habitat from construction activities and minimize risk of noxious weed introduction and the potential for subsequent changes to natural wildfire regimes as a result of alterations in plant assemblages that can increase the frequency and intensity of fire.
- **Design Feature 28 (personnel instruction)**. All Project personnel would be instructed in the importance, purpose, necessity, and regulations for protection of natural resources. Instruction would also be given for reporting and stop work procedures in the event of a resource conflict. This would minimize impacts on wildlife habitat and populations throughout the Project corridor; especially in habitat areas that may not have been identified prior to the start of construction, by highlighting the importance of wildlife resources and by implementing appropriate protection to those resources according to federal and state laws.
- **Design Feature 30 (hazardous materials restrictions)**. Hazardous materials would be contained and removed to a disposal facility, and not drained into the ground, streams, or drainages. This design feature would minimize degradation to wildlife species habitat due to Project activities by limiting the risk of introduction of contaminants into the environment that could adversely affect wildlife habitat.
- **Design Feature 39 (speed limit restrictions)**. All construction vehicle movement would be restricted to a speed limit of 15 mph on overland access routes. This design feature would minimize wildlife mortality due to vehicle collisions by increasing reaction time of both driver and wildlife before collision occurs. Restricting vehicle speed would give drivers a better

opportunity to avoid wildlife on access routes and would increase opportunities for wildlife to avoid approaching vehicles.

In addition, Selective Mitigation Measures 1, 2, 4, 5, 7, 11, 12, 13, 14, and 15 could be implemented to reduce potential high adverse impacts on wildlife species including MIS. The effectiveness of these selective mitigation resources is described in this section.

- **Selective Mitigation Measure 1 (minimization of disturbance to sensitive soils and vegetation)**. Existing trails and roads would not be widened or upgraded in sensitive areas, unless widening or upgrading the existing trails and roads would result in fewer impacts on sensitive areas than would result from building new access roads. Avoiding access road upgrades would limit the amount of habitat disturbed or removed. Avoidance of road upgrades limits vehicular traffic increases by the general public after construction and reduces the potential for indirect effects such as damage or loss of vegetation, spread of noxious weeds, and harassment of wildlife.
- **Selective Mitigation Measure 2 (avoidance of sensitive resources)**. No blading of new access roads would occur in sensitive resource areas (e.g., wildlife habitats and populations). Existing roads would be used in these areas. This mitigation measure would minimize habitat loss, degradation, and fragmentation and reduce the risk of isolation between habitat areas and subpopulations, which could affect adversely dispersal rates, diversity, and abundance of wildlife species.
- **Selective Mitigation Measure 4 (minimization of tree clearing).** Trees and other vegetation would be removed selectively (e.g., edge feathering), and trees more than 5 feet tall would be removed selectively in riparian and tree nesting habitats. Minimizing the number of trees cleared in sensitive habitats, this mitigation measure would reduce impacts on timber resources, limit special status wildlife habitat fragmentation, and protect raptor nesting habitats to the extent feasible.
- **Selective Mitigation Measure 5 (minimization of new or improved Project accessibility)**. All new or improved access roads not required for maintenance would be closed or rehabilitated following Project construction in accordance with prior agency approval and using the most effective and least environmentally damaging methods. This mitigation measure would restore natural contours, vegetation, and potential habitat and limit public access and anthropogenic disturbance to wildlife populations.
- **Selective Mitigation Measure 7 (spanning or avoiding of sensitive features)**. Project structures would be located to allow conductors to span or avoid identified sensitive features such as wildlife populations and habitat. This mitigation measure would avoid sensitive habitats such as riparian areas used as seasonal habitat and movement corridors, thereby reducing potential loss, degradation, and fragmentation of wildlife habitat in the Project area and reducing the risk of isolation between habitat areas and subpopulations, which can adversely impact dispersal rates, diversity, and abundance in wildlife species.
- **Selective Mitigation Measure 11 (minimization of right-of-way-clearing)**. In select areas, the right-of-way width may be modified to protect wildlife. This mitigation measure would limit the amount of vegetation cleared from the right-of-way and minimize abruptness in vegetation assemblage between the right-of-way and adjacent habitat, which would reduce impacts on foraging and breeding behavior, and movement potential of wildlife species.
- **Selective Mitigation Measure 12 (seasonal and spatial wildlife restrictions)**. Construction and maintenance activities would be restricted in designated areas, such as crucial winter range for big game; and during critical periods, such as species-specific breeding or nesting seasons (refer

to Appendix E, Tables E-11 through E-14). This selective mitigation measure would minimize disturbance to wildlife by limiting human activity, noise and disturbance during sensitive life cycle periods, and reduce the risk on negative impacts on breeding success and species survival rates.

- **Selective Mitigation Measure 13 (overland access)**. Overland access using drive-and-crush (alteration of vegetation) and/or clear-and-cut travel (removal of aboveground vegetation without damaging the root stock) would occur in areas where no grading is needed to access work areas. This mitigation measure would reduce removal of surface soil and vegetation, reduce potential for erosion and loss of habitat, and reduce public access and associated indirect effects.
- **Selective Mitigation Measure 14 (flight diverters and perch deterrents)**. Shield wires, guy wires, and overhead optical ground wire along portions of the transmission line that have a high potential for avian collisions would be marked with flight diverters or other BLM- or USFS-approved devices in accordance with agency requirements. Portions of the transmission line that cross through, or are adjacent to, waterfowl and general migratory pathways or sensitive habitat for avian species may be marked to reduce the risk of avian collisions. This measure may also include use of devices to deter raptors from perching on transmission line structures. The specific segments to be marked or to include perch deterrents would be determined in consultation with the appropriate agencies. In addition to protections from Design Feature 4 (APLIC avian safe standards for high-voltage transmission lines), this feature would minimize risk of avian injury and mortality due to collision with Project features that cross sensitive avian areas, and reduce increased risk of potential predation rates on sensitive species in the Project area.
- **Selective Mitigation Measure 15 (limitation of access to sensitive habitats)**. Where feasible, access roads that cross sensitive habitats (e.g., wildlife management areas[WMA] and crucial, severe or critical winter range) would be gated or otherwise blocked in consultation with the appropriate agencies to limit public access. This mitigation measure would limit human activity, stress and disturbance to wildlife and their habitats during critical life cycle periods.

Effects Analysis

Methods for Analysis to Support Interdisciplinary Comparison of Alternative Routes

Detailed analysis of the level of impacts of the Project on elk, mule deer, pronghorn, moose, and bighorn sheep populations was performed using designated crucial range and migration corridors, as the availability of crucial range is considered a limiting factor for big game species. Potential impacts on big game habitat were analyzed by determining the number of miles of crucial habitat crossed by each alternative route and route variations in Wyoming, Colorado and Utah. Data used to analyze impacts on elk populations were designated calving grounds, summer concentration areas, crucial spring/fall, summer, winter and year-long; severe winter range, and migration corridors. Impacts on mule deer populations were analyzed using summer concentration areas; crucial spring/fall, summer, winter, winter/spring and year-long, critical winter range, and migration corridors. Impacts on pronghorn populations were analyzed using fawning habitat, severe winter range, crucial year-long habitats, and migration corridors. Impacts on moose were analyzed using calving grounds; and crucial spring/fall, winter and year-long habitat. Potential impacts on Rocky Mountain and desert bighorn sheep were analyzed using crucial year-long habitat.

Criteria for Assessing Level of Impacts

Criteria were developed in collaboration with the Agency Interdisciplinary Team to assess the level of a potential effect on wildlife resources associated with implementation of the Project (Table 3-79) and to compare the impacts between alternative routes. Impact criteria were based on considerations of a species status, regulatory protection, and susceptibility to temporary or permanent disturbances.

TABLE 3-79 CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON WILDLIFE	
Level of Impacts	**Description**
High	▪ Permanent disruption of seasonal wildlife migration patterns ▪ Ongoing mortality of wildlife due to direct interaction with the Project that may result in population-level effects ▪ Impacts on fawning areas during sensitive seasons ▪ Long-term disruption or displacement of wildlife from crucial, critical, or severe habitats during sensitive periods resulting from noise and human presence (e.g., continuous construction activities)
Moderate	▪ Temporary disturbance or creation of temporary barriers to movement in wildlife migration corridors ▪ Incidental mortality of wildlife due to direct interaction with the Project that does not result in population-level effects ▪ Temporary, short-term disturbance or displacement of wildlife from crucial, critical or severe habitats during sensitive periods resulting from minor or brief periods of noise and human presence (e.g., minor use of access roads with passenger vehicles, survey and staking operations)
Low	▪ Disturbance in migration corridors that does not create a physical barrier and occurs outside sensitive periods ▪ Loss or disturbance of crucial, critical or severe wildlife habitats that occurs outside sensitive periods
Nonidentifiable	▪ Locations where no effects on wildlife are identifiable due to absence of sensitive habitats selected for analysis

Initial Impacts

The level of a potential effect on a wildlife resource (i.e., a particular species or habitat type) that could result from implementation of the Project is used as the basis for assessing initial impacts. Design features of the Proposed Action for environmental projection (Table 2-8) would reduce impacts on wildlife resources and were considered when assessing potential impacts on specific resources. Based on the level of a potential effect on a wildlife resource, initial impacts were assigned (Table 3-80) using the criteria presented in Table 3-79.

TABLE 3-80 SUMMARY OF INITIAL AND RESIDUAL IMPACTS BY HABITAT TYPE					
Common Name	**Habitat Type**	**Relevant Design Feature (location-specific)[1]**	**Initial Impact**	**Selective Mitigation Measure Applied (location specific)**	**Residual Impact**
Mammals – Big Game					
Bighorn sheep	Crucial seasonal habitat	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
	Lambing areas	26, 27, 28, 30, 39	High	12, 15	Low
Elk	Crucial/severe seasonal habitat[1]	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
	Calving grounds	26, 27, 28, 30, 39	High	12, 15	Low
	Migration corridors	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
Mule deer	Crucial/critical seasonal habitat[1]	26, 27, 28, 30	High/Moderate	12, 15	Low
	Fawning areas	26, 27, 28, 30, 39	High	12, 15	Low
	Migration corridors	26, 27, 28, 30, 39	High/Moderate	12, 15	Low

TABLE 3-80 SUMMARY OF INITIAL AND RESIDUAL IMPACTS BY HABITAT TYPE					
Common Name	**Habitat Type**	**Relevant Design Feature (location-specific)[1]**	**Initial Impact**	**Selective Mitigation Measure Applied (location specific)**	**Residual Impact**
Moose	Crucial/severe seasonal habitat	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
	Calving grounds	26, 27, 28, 30, 39	High	12, 15	Low
Pronghorn	Crucial/severe seasonal habitat	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
	Fawning areas	26, 27, 28, 30, 39	High	12, 15	Low
	Migration corridors	26, 27, 28, 30, 39	High/Moderate	12, 15	Low
NOTE: [1]Design features of the Proposed Action and selective mitigation measures are identified in Tables 2-8 and 2-13, respectively.					

Residual Impacts

Initial impacts on wildlife resources are determined as a result of implementing seasonal wildlife restrictions on construction and maintenance activities within the Project area. The BLM and other agencies may grant exceptions to seasonal wildlife restrictions, but only if an exception could be granted without causing the impact the seasonal restriction was designed to avoid or minimize (e.g., warm spring resulting in early migration of big game off of winter range). The BLM will develop a standardized method for evaluating requests for exceptions to seasonal restrictions, including requirements for resource data collection and monitoring of activities in exception areas that would be included in the POD. Selective mitigation measures are applied to reduce the level of initial impacts associated with Project construction and maintenance. Residual impacts are anticipated impacts on resources after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness section. The level of potential residual impacts on wildlife resources associated with implementation of the Project was assessed using the criteria presented in Table 3-79. A summary of anticipated initial and residual impacts on wildlife resources, as well as the selective mitigation measures applied, are presented in Table 3-80.

Methods for Additional Analysis of Potential Impacts

In addition to the analysis conducted to allow interdisciplinary comparison of alternative routes, additional analyses were required to adequately address some issues raised by the public and the agencies during scoping regarding potential impacts on wildlife resources or to meet the requirements of relevant law, regulation, or policy.

For additional analysis of potential impacts on big game, all overlapping nonlimiting seasonal habitat not used to analyze the level of Project impacts on crucial big game habitat in Wyoming, Colorado and Utah was combined in to a single data layer for analysis of impacts on big game and analyzed as big game nonlimiting range. The number of miles crossed and extent of the disturbance of nonlimiting habitat due to the construction, operation, and maintenance of the Project was estimated to provide an additional measure of the extent of disturbance to designated big game habitat. In addition, the extent of loss of crucial, critical and severe habitat (in acres) due to construction, operation, and maintenance of the Project was estimated to present a more spatially explicit measure of impacts on wildlife resources. The total extent of disturbance (in acres) due to construction of features such as roads, transmission line towers, and other Project facilities was estimated over the entire length of an alternative route using the access model developed for the Project and the Applicant's Project description (refer to Section 2.5.1.2). Disturbance associated with construction of the Project was assumed to occur at a constant density per mile and was calculated for each alternative route based on the total estimated disturbance and total length of each

alternative route. The estimated density of disturbance (in acres per mile) for each alternative route was used to calculate the extent of effects on wildlife habitat (in acres) that could occur for each length of habitat crossed.

As the estimated density of disturbance per mile varies by alternative route, alternative routes that cross the same length of wildlife habitat may vary in estimated area of disturbance (in acres) to the habitat.

3.2.7.5 Results

Under all action alternatives, disturbance to wildlife habitat through temporary and permanent loss of vegetation and changes in plant assemblages would occur in the Project area. Wildlife habitats affected by the Project include riparian, arid and semi-arid desert shrub, grasslands, sagebrush, sagebrush steppe, pinyon-juniper, mountain shrub, mixed conifer, aspen, alpine and montane communities (Section 3.2.5.4), and impacts on these habitats could adversely affect wildlife species.

Impacts on birds, including raptors, upland game birds and migratory bird species would be anticipated for all alternative routes; representative species are discussed in Section 3.2.7.4. Activities related to Project construction and maintenance would likely result in loss or alteration of habitat. Impacts on special status raptor species and active nests by each alternative route are described in Section 3.2.8. Impacts would be minimized by applying conservation measures (design features of the Proposed Action and selective mitigation measures) to protect active nests. Adverse impacts on foraging and nesting habitat, particularly for ground-nesting birds, upland game birds, and habitat-obligate that includes sagebrush obligate species, could result from vegetation removal, road and tower construction, as well as either temporary or permanent displacement of individuals. Mortality of birds, including waterfowl and migratory bird species could occur directly due to collisions with the transmission line or towers, although probability is likely to be a function of bird morphology, behavior and species (APLIC 2012; Janss 2000). Mortality also could occur through electrocution. Research suggests species at higher risk of mortality from electrocution are raptor species and thermal soarers (Janss 2000). Electrocution risk would be minimized through avian-safe transmission line design that separates energized and grounded structures (APLIC 2006). Mortality could occur indirectly as a result of increased predation pressure by predators attracted to the transmission line, or through nest abandonment resulting from increased human disturbance, which potentially could reduce fitness, survival, and reproductive performance of some individuals (Riffell et al. 1996). Furthermore, the Project area is situated on the western edge of the Central Flyway. Potential effects on migratory species include the loss, alteration or degradation of stopover habitat, particularly in concentration areas associated with the Green, Yampa, Colorado and White river systems. For a list of BCC and PIF migratory birds and their breeding habitats within Wyoming, Colorado and Utah that are likely to occur throughout the Project area refer to Appendix E, Table E-6. Prominent habitats for migratory birds that may be affected by Project alternative routes are described in the Environmental Setting for each alternative grouping. Detailed analysis of potential impacts on specific habitat types that are likely to be used by sagebrush obligate species, upland game birds, waterfowl and migratory birds is included in (Section 3.2.5).

A wide range of mammal and reptile species could be affected by Project alternative routes. Representative species are discussed in Section 3.2.7.4. Impacts specific to big game species are described under each alternative route. Limited data are available to determine presence and relative abundance of the majority of mammal and reptile species in the Project area. Adverse impacts on mammals and reptiles could occur, and could potentially be greater for sagebrush obligates, species with limited range, species with low levels of mobility, or species that depend on microclimates for survival. Impacts on mammal and reptile species could include temporary or permanent displacement of individuals from occupied habitat, and increased mortality risk through collisions with Project construction equipment. Risk of mortality or injury is likely to be a function of species morphology and

behavior. Impacts on mammal and reptile foraging and breeding habitat could result from vegetation removal, loss, alteration, isolation or fragmentation of habitat due to road and tower construction. Detailed analysis of potential impacts on habitat types that are likely to be used by mammal and reptile species is included under (Section 3.2.5).

3.2.7.5.1 Impacts Common to All Action Alternatives

There are no impacts common to all action alternatives.

3.2.7.5.2 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.7.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary transmission line components would be located in an area between the Mona and Clover substations west of the town of Mona, Utah. Most of the 345kV ancillary transmission line components would be within an existing right-of-way. The components cross the eastern edge of a large area of mule deer crucial winter/spring range that extends east to U.S. Highway 6 and north to Santaquin.

3.2.7.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Environmental Setting

The four WYCO alternative routes cross the southern reaches of the Wyoming Basin and northern Colorado Plateau ecoregions, crossing Sweetwater and Carbon counties in Wyoming, and Moffat and Routt counties in Colorado. The climate is classified as cold deserts; with warm to hot summers with low humidity to cool, cold dry winters. Habitat in this portion of the Project area is dominated by arid shrub/shrub-steppe and big sagebrush, and includes pinyon-juniper and grasslands east of Dinosaur National Monument and aspen and mountain shrub communities west of the Routt National Forest in Colorado. These habitat types are potentially suitable habitat for a variety of migratory bird species. For a list of BCC and PIF migratory birds and their breeding habitats within Wyoming and Colorado that are likely to occur throughout the Project area refer to Appendix E, Table E-6. Developed areas include the cities of Hanna, Rawlins and Sinclair in Wyoming and Craig in Colorado.

From the Aeolus substation, all alternative routes cross the Medicine Bow River. Alternatives WYCO-B, WYCO-C, and WYCO-F run west of Hanna, and Alternative WYCO-D runs east of Hanna parallel with an existing transmission line and in proximity to wind turbines. All alternative routes converge 2 miles southwest of Walcott and follow existing disturbance toward Wamsutter. Existing disturbances include the Hanna rail system, Southern Star Central gas pipeline, and I-80. From Wamsutter, all alternative routes head south through shrub/shrub-steppe and sagebrush habitats to the Wyoming/Colorado border near the Little Snake River.

Alternative WYCO-C follows an existing pipeline corridor through a large area of existing oil and gas development. Alternatives WYCO-B and WYCO-F cross shrub/shrub-steppe and sagebrush habitats and existing roads and energy development west and east of Flat Top Mountain respectively. Alternative WYCO-D follows Wyoming Highway 789 to Baggs, Wyoming, crossing existing oil and gas and development areas and riparian habitat at Baggs associated with the Little Snake River. South of the Wyoming/Colorado border, Alternative WYCO-D heads south to Craig, crossing the Yampa River before turning west, following U.S. Highway 40 and an existing transmission line toward Massadona through sagebrush, grassland, and pinyon-juniper habitats. South of the Wyoming/Colorado border, Alternatives

WYCO-B, WYCO-C, and WYCO-F run north of the Little Snake River, and then turn south, west of Maybell along the Sevenmile Ridge, crossing shrub/shrub-steppe, sagebrush, and pinyon-juniper habitats relatively undisturbed by roads and energy development. All alternative routes then converge approximately 3 miles north of Wapiti Peak and gain elevation across Elk Springs Ridge before following U.S. Highway 40 southwest toward Massadona. All WYCO alternative routes cross designated big game habitat for elk, mule deer and pronghorn. (MV-8a and MV-9a).

The majority of big game nonlimiting range in Wyoming is located between Walcott and Saratoga and extends east on the Medicine Bow National Forest; and between Cherokee and Baggs, east of Wyoming Highway 789. Extensive elk habitat occurs in the Project area. In Wyoming, elk crucial winter range is located northwest of Elk Mountain. Crucial winter/year-long habitats occur west of Elk Mountain, between Rawlins and Dixon, west of Baggs. Elk winter habitat areas are located between Hanna and Saratoga and between Rawlins and Baggs. Winter/year-long habitat is located between the Aeolus substation site and Elk Mountain and between Rawlins and Dixon. An area of spring/summer/fall habitat occurs south of Rawlins. Elk migration corridors occur between Rawlins and the Medicine Bow National Forest, just north of the Wyoming/Colorado border. In Colorado, elk nonlimiting range occurs throughout the state, with the largest contiguous areas in Moffat and Routt counties to the west of Routt National Forest. Extensive elk severe winter range is located along the Wyoming/Colorado state line between Craig and Maybell, the vicinity of Meeker, and between Maybell and Dinosaur. Summer concentration areas are located between the Wyoming/Utah border and Maybell, and southeast of Craig. Elk calving grounds are located north and west of Maybell. Elk migration corridors occur between the Wyoming/Utah border and Craig and Maybell and between Craig and Meeker (MV-8a).

In Wyoming, mule deer nonlimiting range is located between I-80 and the Wyoming/Colorado state line, and east and west of Medicine Bow National Forest at elevations below 7,000 feet. Mule deer crucial winter/year-long habitat is located near the proposed Aeolus substation, between Hanna and Rawlins, the Wyoming Highway 789 corridor north of Baggs, north of Dixon, and along the Wyoming/Colorado state line. Spring/summer/fall habitat is located between south of Rawlins to the Wyoming/Colorado state line and south of Rock Springs to the Wyoming/Colorado/Utah state line. Mule deer year-long habitat is located in the vicinity of Hanna. Mule deer migration corridors occur throughout the Project area in Wyoming. In Colorado, mule deer nonlimiting range occurs throughout the state, with the largest contiguous areas located between Craig and Dinosaur National Monument. Mule deer critical winter range stretches from the Wyoming/Colorado state line along the major river valleys of the Little Snake in Moffat County. Mule deer migration corridors occur between Craig and Meeker (MV-9a).

In Wyoming, pronghorn nonlimiting range occurs throughout the state, south of the Sweetwater and North Platte rivers. Pronghorn crucial winter/year-long habitat is located near the proposed Aeolus substation, north of Saratoga, along the I-80 corridor between Rawlins and Wamsutter, along the Wyoming Highway 789 corridor north of Baggs, and the Wyoming/Colorado state line. Spring/summer/fall habitat is located south of Hanna and Rawlins. Pronghorn migration corridors are located between Rawlins and Baggs and west to Wyoming Highway 430. In Colorado, pronghorn nonlimiting range is located throughout Moffat County, between the Wyoming/Colorado state line and the Yampa River. Pronghorn severe winter range is located along the Wyoming/Colorado state line south of Baggs, west of Craig, and in the vicinity of Maybell. Pronghorn migration corridors occur between Baggs and Maybell (MV-9a).

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2 and WYCO-B-2 follow the same alignment through Wyoming. All WYCO route variations cross an area of oil and gas development and follow existing access roads in Wyoming. Dominant wildlife habitats crossed by Alternative WYCO-B and route variations are big sagebrush and shrub/shrub steppe, with smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, and riparian habitats (Section 3.2.5.4).

Mammals

Big Game

The extent of big game nonlimiting and crucial range crossed by each WYCO alternative route is displayed in Tables 3-81 and 3-82.

Alternative WYCO-B in Wyoming crosses elk nonlimiting range in the vicinity of Walcott and near the Wyoming/Colorado state line. The alternative route crosses elk crucial year-long range and migration corridors along the Wyoming/Colorado state line along the Little Snake River and elk migration corridors approximately 15 miles west of Rawlins in the I-80 corridor. The alternative route does not cross elk calving grounds or crucial summer concentration areas.

TABLE 3-81
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Nonlimiting Range[2] (miles crossed)				
		Elk	Mule Deer	Pronghorn	Moose	Rocky Mountain Bighorn Sheep
Alternative WYCO-B and Route Variations						
WYCO-B (Applicant Preferred Alternative)	204.5	52.5	138.2	164.1	8.3	0.0
Wyoming	*138.1*	*7.7*	*114.8*	*107.9*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*
WYCO-B-1	204.9	52.9	139.0	164.5	8.3	0.0
Wyoming	*138.1*	*7.7*	*114.8*	*107.9*	*8.3*	*0.0*
Colorado	*66.8*	*45.2*	*24.2*	*56.6*	*0.0*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	49.2	138.9	164.1	8.3	0.0
Wyoming	*138.1*	*7.7*	*114.8*	*107.9*	*8.3*	*0.0*
Colorado	*66.4*	*41.5*	*24.1*	*56.2*	*0.0*	*0.0*
WYCO-B-3	204.5	52.5	138.2	164.1	8.3	0.0
Wyoming	*138.1*	*7.7*	*114.8*	*107.9*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*
Alternative WYCO-C and Route Variations						
WYCO-C	210.4	54.2	144.1	171.3	8.3	0.0
Wyoming	*144.0*	*9.4*	*120.7*	*115.1*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*
WYCO-C-1	210.8	54.6	144.9	171.7	8.3	0.0
Wyoming	*144.0*	*9.4*	*120.7*	*115.1*	*8.3*	*0.0*
Colorado	*66.8*	*45.2*	*24.2*	*56.6*	*0.0*	*0.0*

TABLE 3-81
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Nonlimiting Range[2] (miles crossed)				
		Elk	Mule Deer	Pronghorn	Moose	Rocky Mountain Bighorn Sheep
WYCO-C-2	210.4	50.9	144.8	171.3	8.3	0.0
Wyoming	*144.0*	*9.4*	*120.7*	*115.1*	*8.3*	*0.0*
Colorado	*66.4*	*41.5*	*24.1*	*56.2*	*0.0*	*0.0*
WYCO-C-3	210.4	54.2	144.1	171.3	8.3	0.0
Wyoming	*144.0*	*9.4*	*120.7*	*115.1*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*
Alternative WYCO-D and Route Variation						
WYCO-D	250.0	126.5	141.1	179.3	13.2	0.0
Wyoming	*135.0*	*33.1*	*86.0*	*89.4*	*13.2*	*0.0*
Colorado	*115.0*	*93.4*	*55.1*	*89.9*	*0.0*	*0.0*
WYCO-D-1	250.0	126.5	141.1	179.3	13.2	0.0
Wyoming	*133.5*	*33.1*	*86.0*	*89.4*	*13.2*	*0.0*
Colorado	*115.0*	*93.4*	*55.1*	*89.9*	*0.0*	*0.0*
Alternative WYCO-F and Route Variations						
WYCO-F	218.9	52.0	141.8	169.6	8.3	0.0
Wyoming	*152.5*	*7.2*	*118.4*	*113.4*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*
WYCO-F-1	219.3	52.4	142.6	170.0	8.3	0.0
Wyoming	*152.5*	*7.2*	*118.4*	*113.4*	*8.3*	*0.0*
Colorado	*66.8*	*45.2*	*24.2*	*56.6*	*0.0*	*0.0*
WYCO-F-2	218.9	48.7	142.5	169.6	8.3	0.0
Wyoming	*152.5*	*7.2*	*118.4*	*113.4*	*8.3*	*0.0*
Colorado	*66.4*	*41.5*	*24.1*	*56.2*	*0.0*	*0.0*
WYCO-F-3	218.9	52.0	141.8	169.6	8.3	0.0
Wyoming	*152.5*	*7.2*	*118.4*	*113.4*	*8.3*	*0.0*
Colorado	*66.4*	*44.8*	*23.4*	*56.2*	*0.0*	*0.0*

NOTES:
[1]Each of the big game species will not add to the total miles column due to the overlapping habitats.
[2]Includes all designated habitat in Wyoming and Colorado except habitat in Table 3-82.

Alternative WYCO-B in Wyoming crosses mule deer nonlimiting range at the proposed Aeolus substation and from Rawlins to the Wyoming/Colorado state line. The alternative route crosses mule deer crucial winter/year-long habitat at the proposed Aeolus substation, between Hanna and Rawlins at Fort Steele Breaks, and along the Wyoming/Colorado state line along the Little Snake River. This alternative route crosses mule deer year-long habitat in the vicinity of Hanna and migration corridors approximately 15 miles west of Rawlins in the I-80 corridor and west of Flat Top Mountain. The alternative route does not cross mule deer summer concentration areas.

TABLE 3-82
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																
		Elk					Mule Deer				Pronghorn				Moose			Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Summer/ Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Crucial Summer/ Summer Concentration	Crucial/Critical Winter Range	Crucial Year-long	Migration Corridors	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Calving Grounds	Severe Winter Range	Crucial Year-long	Crucial Year-long
Alternative WYCO-B and Route Variations																		
WYCO-B (Applicant Preferred Alternative)	204.5	10.4	10.4	25.0	1.7	3.5	0.0	25.0	23.2	4.1	0.0	15.7	30.1	10.3	0.0	0.0	0.0	0.0
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.1*	*0.0*	*0.0*	*30.1*	*10.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.0*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*0.0*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-B-1	204.9	10.4	10.4	25.7	1.7	3.5	0.0	23.9	23.2	4.1	0.0	17.1	30.1	10.3	0.0	0.0	0.0	0.0
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.1*	*0.0*	*0.0*	*30.1*	*10.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.8*	*10.4*	*10.4*	*25.7*	*0.0*	*0.0*	*0.0*	*23.6*	*0.0*	*0.0*	*0.0*	*17.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	10.4	10.4	23.6	1.7	3.5	0.0	27.8	23.2	4.1	0.0	15.6	30.1	10.3	0.0	0.0	0.0	0.0
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.1*	*0.0*	*0.0*	*30.1*	*10.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*23.6*	*0.0*	*0.0*	*0.0*	*27.5*	*0.0*	*0.0*	*0.0*	*15.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-B-3	204.5	10.4	10.4	25.3	1.7	3.5	0.0	25.0	23.2	4.1	0.0	15.7	30.1	10.3	0.0	0.0	0.0	0.0
Wyoming	*138.1*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.1*	*0.0*	*0.0*	*30.1*	*10.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.3*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*0.0*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

TABLE 3-82
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																
		Elk					Mule Deer				Pronghorn				Moose			Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Summer/ Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Crucial Summer/ Summer Concentration	Crucial/Critical Winter Range	Crucial Year-long	Migration Corridors	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Calving Grounds	Severe Winter Range	Crucial Year-long	Crucial Year-long
Alternative WYCO-C and Route Variations																		
WYCO-C	210.4	10.4	10.4	25.0	1.7	3.5	0.0	25.0	23.2	4.2	0.0	15.7	28.8	8.5	0.0	0.0	0.0	0.0
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.2*	*0.0*	*0.0*	*28.8*	*8.5*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.0*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*0.0*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-C-1	210.8	10.4	10.4	25.7	1.7	3.5	0.0	23.9	23.2	4.2	0.0	17.1	28.8	8.5	0.0	0.0	0.0	0.0
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.2*	*0.0*	*0.0*	*28.8*	*8.5*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.8*	*10.4*	*10.4*	*25.7*	*0.0*	*0.0*	*0.0*	*23.6*	*0.0*	*0.0*	*0.0*	*17.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-C-2	210.4	10.4	10.4	23.6	1.7	3.5	0.0	27.8	23.2	4.2	0.0	15.6	28.8	8.5	0.0	0.0	0.0	0.0
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.2*	*0.0*	*0.0*	*28.8*	*8.5*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*23.6*	*0.0*	*0.0*	*0.0*	*27.5*	*0.0*	*0.0*	*0.0*	*15.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-C-3	210.4	10.4	10.4	25.3	1.7	3.5	0.0	25.0	23.2	4.2	0.0	15.7	28.8	8.5	0.0	0.0	0.0	0.0
Wyoming	*144.0*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*23.2*	*4.2*	*0.0*	*0.0*	*28.8*	*8.5*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.3*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*0.0*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Alternative WYCO-D and Route Variation																		
WYCO-D	250.0	0.0	0.0	94.6	0.0	35.8	0.0	56.7	49.0	11.3	0.0	42.4	45.6	6.3	0.0	0.0	0.0	0.0
Wyoming	*135.0*	*0.0*	*0.0*	*0.0*	*0.0*	*2.1*	*0.0*	*0.0*	*49.0*	*10.8*	*0.0*	*0.0*	*45.6*	*6.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*115.0*	*0.0*	*0.0*	*94.6*	*0.0*	*33.7*	*0.0*	*56.7*	*0.0*	*0.5*	*0.0*	*42.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-D-1	250.0	0.0	0.0	94.9	0.0	35.8	0.0	56.7	49.0	11.3	0.0	42.4	45.6	6.3	0.0	0.0	0.0	0.0
Wyoming	*133.5*	*0.0*	*0.0*	*0.0*	*0.0*	*2.1*	*0.0*	*0.0*	*49.0*	*10.8*	*0.0*	*0.0*	*45.6*	*6.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*115.0*	*0.0*	*0.0*	*94.9*	*0.0*	*33.7*	*0.0*	*56.7*	*0.0*	*0.5*	*0.0*	*42.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

TABLE 3-82
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																
		Elk					Mule Deer				Pronghorn				Moose			Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Summer/ Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Crucial Summer/ Summer Concentration	Crucial/Critical Winter Range	Crucial Year-long	Migration Corridors	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors	Calving Grounds	Severe Winter Range	Crucial Year-long	Crucial Year-long
Alternative WYCO-F and Route Variations																		
WYCO-F	218.9	10.4	10.4	25.0	1.7	3.5	0.0	25.0	0.0	25.0	0.0	15.7	39.0	12.3	0.0	0.0	0.0	0.0
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.0*	*39.0*	*12.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.0*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-F-1	219.3	10.4	10.4	25.7	1.7	3.5	0.0	23.9	0.0	23.9	0.0	17.1	39.0	12.3	0.0	0.0	0.0	0.0
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*0.0*	*0.3*	*0.0*	*0.0*	*39.0*	*12.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.7*	*0.0*	*0.0*	*0.0*	*23.6*	*0.0*	*23.6*	*0.0*	*17.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-F-2	218.9	10.4	10.4	23.6	1.7	3.5	0.0	27.8	34.0	27.8	0.0	15.6	39.0	12.3	0.0	0.0	0.0	0.0
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*34.0*	*0.3*	*0.0*	*0.0*	*39.0*	*12.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*23.6*	*0.0*	*0.0*	*0.0*	*27.5*	*0.0*	*27.5*	*0.0*	*15.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
WYCO-F-3	218.9	10.4	10.4	25.3	1.7	3.5	0.0	25.0	34.0	25.0	0.0	15.7	39.0	12.3	0.0	0.0	0.0	0.0
Wyoming	*152.5*	*0.0*	*0.0*	*0.0*	*1.7*	*3.5*	*0.0*	*0.3*	*34.0*	*0.3*	*0.0*	*0.0*	*39.0*	*12.3*	*0.0*	*0.0*	*0.0*	*0.0*
Colorado	*66.4*	*10.4*	*10.4*	*25.3*	*0.0*	*0.0*	*0.0*	*24.7*	*0.0*	*24.7*	*0.0*	*15.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*

NOTE: [1]Each of the big game species will not add to the total miles column due to overlapping habitats.

Alternative WYCO-B in Wyoming crosses extensive pronghorn nonlimiting range along the entire length of the route. The alternative route crosses pronghorn crucial winter/year-long habitat at the proposed Aeolus substation, along the I-80 corridor between Rawlins and Wamsutter and at the Wyoming/Colorado state line along the Little Snake River. This alternative route crosses pronghorn migration corridors east of Rawlins at Fort Steele Breaks, 15 miles west of Rawlins in the I-80 corridor and west of Flat Top Mountain. The alternative route does not cross pronghorn fawning areas or severe winter range.

Alternative WYCO-B in Wyoming crosses moose nonlimiting range but does not cross moose or bighorn sheep crucial habitat.

Environmental Consequences (Wyoming)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on wildlife that could occur under all alternative routes and the degree to which these effects would be mitigated or avoided are described in detail earlier in this section. Estimated residual impacts on big game (i.e., elk, mule deer, pronghorn, moose, and Rocky Mountain bighorn sheep) after the application of selective mitigation measures are presented in Table 3-83.

TABLE 3-83
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Big Game Crucial Habitat[1] (miles crossed)			
		Nonidentifiable	Low	Moderate	High
Alternative WYCO-B and Route Variations					
WYCO-B (Applicant Preferred Alternative)	204.5	103.9	100.6	0.0	0.0
Wyoming	*138.1*	*84.9*	*53.2*	*0.0*	*0.0*
Colorado	*66.4*	*19*	*47.4*	*0.0*	*0.0*
WYCO-B-1	204.9	103.9	101.0	0.0	0.0
Wyoming	*138.1*	*84.9*	*53.2*	*0.0*	*0.0*
Colorado	*66.8*	*19.0*	*47.8*	*0.0*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	103.3	101.2	0.0	0.0
Wyoming	*138.1*	*84.9*	*53.2*	*0.0*	*0.0*
Colorado	*66.4*	*18.4*	*48.0*	*0.0*	*0.0*
WYCO-B-3	204.5	103.6	100.9	0.0	0.0
Wyoming	*138.1*	*84.9*	*53.2*	*0.0*	*0.0*
Colorado	*66.4*	*18.7*	*47.7*	*0.0*	*0.0*
Alternative WYCO-C and Route Variations					
WYCO-C	210.4	112.9	97.5	0.0	0.0
Wyoming	*144.0*	*93.9*	*50.1*	*0.0*	*0.0*
Colorado	*66.4*	*19*	*47.4*	*0.0*	*0.0*
WYCO-C-1	210.8	112.9	97.9	0.0	0.0
Wyoming	*144.0*	*93.9*	*50.1*	*0.0*	*0.0*
Colorado	*66.8*	*19.0*	*47.8*	*0.0*	*0.0*
WYCO-C-2	210.4	112.3	98.1	0.0	0.0
Wyoming	*144.0*	*93.9*	*50.1*	*0.0*	*0.0*
Colorado	*66.4*	*18.4*	*48.0*	*0.0*	*0.0*

TABLE 3-83 ALTERNATIVE ROUTE COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES					
		Big Game Crucial Habitat[1] (miles crossed)			
Alternative Route	**Total Miles**	**Nonidentifiable**	**Low**	**Moderate**	**High**
WYCO-C-3	210.4	112.6	97.8	0.0	0.0
Wyoming	*144.0*	*93.9*	*50.1*	*0.0*	*0.0*
Colorado	*66.4*	*18.7*	*47.7*	*0.0*	*0.0*
Alternative WYCO-D and Route Variation					
WYCO-D	250.0	73.5	176.5	0.0	0.0
Wyoming	*135.0*	*60.9*	*74.1*	*0.0*	*0.0*
Colorado	*115.0*	*12.6*	*102.4*	*0.0*	*0.0*
WYCO-D-1	250.0	73.2	176.8	0.0	0.0
Wyoming	*135.0*	*60.9*	*74.1*	*0.0*	*0.0*
Colorado	*115.0*	*12.3*	*102.7*	*0.0*	*0.0*
Alternative WYCO-F and Route Variations					
WYCO-F	218.9	96.5	122.4	0.0	0.0
Wyoming	*152.5*	*77.5*	*75*	*0.0*	*0.0*
Colorado	*66.4*	*19*	*47.4*	*0.0*	*0.0*
WYCO-F-1	219.3	96.5	122.8	0.0	0.0
Wyoming	*152.5*	*77.5*	*75.0*	*0.0*	*0.0*
Colorado	*66.8*	*19.0*	*47.8*	*0.0*	*0.0*
WYCO-F-2	218.9	95.9	123.0	0.0	0.0
Wyoming	*152.5*	*77.5*	*75.0*	*0.0*	*0.0*
Colorado	*66.4*	*18.4*	*48.0*	*0.0*	*0.0*
WYCO-F-3	218.9	96.2	122.7	0.0	0.0
Wyoming	*152.5*	*77.5*	*75.0*	*0.0*	*0.0*
Colorado	*66.4*	*18.7*	*47.7*	*0.0*	*0.0*

NOTES: [1]Includes impacts on elk, mule deer, pronghorn, moose, and Rocky Mountain bighorn sheep crucial, critical, and severe habitats.

<u>*Mammals*</u>

Big Game

Based on the impact assessment criteria used in this analysis (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative WYCO-B in Wyoming would be low (Table 3-83). Initial impacts on wildlife resources are determined as a result of implementing seasonal wildlife restrictions on construction and maintenance activities within the Project area. The BLM and other agencies may grant exceptions to seasonal wildlife restrictions. However, any exceptions would increase the initial level of impacts on wildlife resources and potentially result in greater residual impacts.

Impacts on big game crucial, critical or severe habitat crossed by Alternative WYCO-B in Wyoming would be low and nonidentifiable in some areas. Refer to Table 3-79 for criteria for assessing level of impacts. Impacts of Alternative WYCO-B would be comparable to impacts of Alternative WYCO-C. Alternatives WYCO-B and WYCO-C would have less impact to big game crucial, critical, or severe habitat in Wyoming than Alternatives WYCO-D and WYCO-F.

<u>Results of Additional Analysis of Potential Impacts</u>

The estimated amount of disturbance (in acres) to elk, mule deer, pronghorn, moose, and Rocky Mountain bighorn sheep nonlimiting and crucial, critical, or severe habitat by the WYCO alternative routes in Wyoming and Colorado are presented in Tables 3-84 and 3-85.

TABLE 3-84
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE ACRES OF DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Big Game Nonlimiting Range (acres)[1]				
	Elk	Mule Deer	Pronghorn	Moose	Rocky Mountain Bighorn Sheep
Alternative WYCO-B and Route Variations					
WYCO-B (Applicant Preferred Alternative)	856	2,255	2,677	135	0
Wyoming	*126*	*1,873*	*1,760*	*135*	*0*
Colorado	*730*	*382*	*917*	*0*	*0*
WYCO-B-1	859	2,258	2,672	135	0
Wyoming	*125*	*1,865*	*1,753*	*135*	*0*
Colorado	*734*	*393*	*919*	*0*	*0*
WYCO-B-2 (Agency Preferred Alternative)	800	2,259	2,668	135	0
Wyoming	*125*	*1,867*	*1,754*	*135*	*0*
Colorado	*675*	*392*	*914*	*0*	*0*
WYCO-B-3	855	2,253	2,675	135	0
Wyoming	*125*	*1,872*	*1,759*	*135*	*0*
Colorado	*730*	*381*	*916*	*0*	*0*
Alternative WYCO-C and Route Variations					
WYCO-C	877	2,335	2,776	134	0
Wyoming	*152*	*1,956*	*1,865*	*134*	*0*
Colorado	*725*	*379*	*911*	*0*	*0*
WYCO-C-1	880	2,338	2,770	1,349	0
Wyoming	*152*	*1,948*	*1,857*	*1,349*	*0*
Colorado	*728*	*390*	*913*	*0*	*0*
WYCO-C-2	822	2,338	2,766	134	0
Wyoming	*152*	*1,949*	*1,859*	*134*	*0*
Colorado	*670*	*389*	*907*	*0*	*0*
WYCO-C-3	877	2,333	2,774	134	0
Wyoming	*152*	*1,954*	*1,864*	*134*	*0*
Colorado	*725*	*379*	*910*	*0*	*0*
Alternative WYCO-D and Route Variation					
WYCO-D	2,021	2,254	2,864	211	0
Wyoming	*529*	*1,374*	*1,428*	*211*	*0*
Colorado	*1,492*	*880*	*1,436*	*0*	*0*
WYCO-D-1	2,024	2,259	2,870	211	0
Wyoming	*530*	*1,377*	*1,431*	*211*	*0*
Colorado	*1,494*	*882*	*1,439*	*0*	*0*

TABLE 3-84
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE ACRES OF DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Big Game Nonlimiting Range (acres)[1]				
	Elk	Mule Deer	Pronghorn	Moose	Rocky Mountain Bighorn Sheep
Alternative WYCO-F and Route Variations					
WYCO-F	839	2,288	2,737	134	0
Wyoming	*116*	*1,910*	*1,830*	*134*	*0*
Colorado	*723*	*378*	*907*	*0*	*0*
WYCO-F-1	842	2,292	2,732	133	0
Wyoming	*116*	*1,903*	*1,822*	*133*	*0*
Colorado	*726*	*389*	*910*	*0*	*0*
WYCO-F-2	783	2,292	2,728	133	0
Wyoming	*116*	*1,904*	*1,824*	*133*	*0*
Colorado	*667*	*388*	*904*	*0*	*0*
WYCO-F-3	838	2,286	2,735	134	0
Wyoming	*116*	*1,909*	*1,829*	*134*	*0*
Colorado	*722*	*377*	*906*	*0*	*0*

NOTE: [1]Includes all designated habitat in Wyoming and Colorado except crucial habitat.

The estimated area of disturbance to elk nonlimiting range for Alternative WYCO-B is similar to WYCO-F, but less than WYCO-C and WYCO-D respectively (Table 3-84). The extent of disturbance to elk crucial year-long habitat and migration corridors is the same for Alternatives WYCO-B, WYCO-C, and WYCO-F in Wyoming (Table 3-85). The location of disturbance corresponds to sensitive habitat crossed by the alternative route, and is discussed under Affected Environment for Alternative WYCO-B. Alternative WYCO-D does not affect elk crucial year-long habitat, and would disturb less elk migration corridors in Wyoming compared to other WYCO alternative routes. The estimated area of disturbance to mule deer severe winter range is the same for Alternatives WYCO-B, WYCO-C, and WYCO-F in Wyoming. The extent of disturbance to mule deer crucial year-long habitat and east to west migration corridors is similar between Alternatives WYCO-B and WYCO-C, which is less than for Alternatives WYCO-F and WYCO-D respectively. East to west mule deer migration corridors affected by Alternatives WYCO-B and WYCO-C occur for a greater area compared to migration corridors affected by Alternatives WYCO-F and WYCO-D, which are constricted at two highway tunnel crossings in the vicinity of Baggs, Wyoming. The estimated area of disturbance to pronghorn crucial year-long habitat is similar between Alternatives WYCO-B and WYCO-C, which is less than for Alternatives WYCO-F and WYCO-D respectively. The estimated area of disturbance to pronghorn migration corridors is greater from Alternatives WYCO-F, then WYCO-B, WYCO-C, and WYCO-D, respectively in Wyoming.

TABLE 3-85
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																
	Elk					Mule Deer				Pronghorn				Moose			Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Year Long	Migration Corridors	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors	Calving Grounds	Crucial Winter Range	Crucial Year Long	Crucial Year Long
Alternative WYCO-B and Route Variations																	
WYCO-B (Applicant Preferred Alternative)	170	170	408	28	57	0	408	378	67	0	256	491	168	0	0	0	0
Wyoming	*0*	*0*	*0*	*28*	*57*	*0*	*5*	*378*	*67*	*0*	*0*	*491*	*168*	*0*	*0*	*0*	*0*
Colorado	*170*	*170*	*408*	*0*	*0*	*0*	*403*	*0*	*0*	*0*	*256*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-B-1	169	169.0	417	28	57	0	388	377	67	0	278	489	167	0	0	0	0
Wyoming	*0*	*0*	*0*	*28*	*57*	*0*	*5*	*377*	*67*	*0*	*0*	*489*	*167*	*0*	*0*	*0*	*0*
Colorado	*169*	*169*	*417*	*0*	*0*	*0*	*383*	*0*	*0*	*0*	*278*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-B-2 (Agency Preferred Alternative)	169	169	384	28	57	0	452	377	67	0	254	489	167	0	0	0	0
Wyoming	*0*	*0*	*0*	*28*	*57*	*0*	*5*	*377*	*67*	*0*	*0*	*484*	*167*	*0*	*0*	*0*	*0*
Colorado	*169*	*169*	*384*	*0*	*0*	*0*	*447*	*0*	*0*	*0*	*254*	*0.*	*0*	*0*	*0*	*0*	*0*
WYCO-B-3	170	170	412	28	57	0	408	378	67	0	256	491	168	0	0	0	0
Wyoming	*0*	*0*	*0*	*28*	*57*	*0*	*5*	*378*	*67*	*0*	*0*	*491*	*168*	*0*	*0*	*0*	*0*
Colorado	*170*	*170*	*412*	*0*	*0*	*0*	*403*	*0*	*0*	*0*	*256*	*0*	*0*	*0*	*0*	*0*	*0*
Alternative WYCO-C and Route Variations																	
WYCO-C	168	168	405	27	57	0	405	376	68	0	254	467	138	0	0	0	0
Wyoming	*0*	*0.0*	*0*	*27*	*57*	*0*	*5*	*376*	*68*	*0*	*0*	*467*	*138*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*405*	*0*	*0*	*0*	*400*	*0*	*0*	*0*	*254*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-C-1	168	168	415	27	56	0	386	374	68	0	276	465	137	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*374*	*68*	*0*	*0*	*465*	*137*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*415*	*0*	*0*	*0*	*381*	*0*	*0*	*0*	*276*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-C-2	168	168	381	27	56	0	449	375	68	0	252	465	137	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*375*	*68*	*0*	*0*	*465*	*137*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*381*	*0*	*0*	*0*	*444*	*0*	*0*	*0*	*252*	*0.0*	*0*	*0*	*0*	*0*	*0*
WYCO-C-3	168	168	410	27	57	0	405	376	68	0	254	466	138	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*57*	*0*	*5*	*376*	*68*	*0*	*0*	*466*	*138*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*410*	*0*	*0*	*0*	*400*	*0*	*0*	*0*	*254*	*0*	*0*	*0*	*0*	*0*	*0*

TABLE 3-85
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																
	Elk					Mule Deer				Pronghorn				Moose			Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Year Long	Migration Corridors	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors	Calving Grounds	Crucial Winter Range	Crucial Year Long	Crucial Year Long
Alternative WYCO-D and Route Variation																	
WYCO-D	0	0	1,511	0	572	0	906	783	180	0	677	728	101	0	0	0	0
Wyoming	*0*	*0*	*0*	*0*	*34*	*0*	*0*	*783*	*172*	*0*	*0*	*728*	*101*	*0*	*0*	*0*	*0*
Colorado	*0*	*0*	*1,511*	*0*	*538*	*0*	*906*	*0.0*	*8*	*0*	*677*	*0.0*	*0*	*0*	*0*	*0*	*0*
WYCO-D-1	0	0	1,519	0	573	0	908	784	181	0	679	730	101	0	0	0	0
Wyoming	*0*	*0*	*0*	*0*	*34*	*0*	*0*	*784*	*173*	*0*	*0*	*730*	*101*	*0*	*0*	*0*	*0*
Colorado	*0*	*0*	*1,519*	*0*	*539*	*0*	*908*	*0*	*8*	*0*	*679*	*0*	*0*	*0*	*0*	*0*	*0*
Alternative WYCO-F and Route Variations																	
WYCO-F	168	168	403	27	56	0	404	549	226	0	253	629	198	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*549*	*226*	*0*	*0*	*629*	*198*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*403*	*0*	*0*	*0*	*399*	*0*	*0*	*0*	*253*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-F-1	167	167	413	27	56	0	384	546	225	0	275	627	198	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*546*	*225*	*0*	*0*	*627*	*198*	*0*	*0*	*0*	*0*
Colorado	*167*	*167*	*413*	*0*	*0*	*0*	*379*	*0*	*0*	*0*	*275*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-F-2	167	167	380	27	56	0	447	547	225	0	251	627	198	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*547*	*225*	*0*	*0*	*627*	*198*	*0*	*0*	*0*	*0*
Colorado	*167*	*167*	*380*	*0*	*0*	*0*	*442*	*0*	*0*	*0*	*251*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-F-3	168	168	408	27	56	0	403	548	226	0	253	629	198	0	0	0	0
Wyoming	*0*	*0*	*0*	*27*	*56*	*0*	*5*	*548*	*226*	*0*	*0*	*629*	*198*	*0*	*0*	*0*	*0*
Colorado	*168*	*168*	*408*	*0*	*0*	*0*	*398*	*0*	*0*	*0*	*253*	*0*	*0*	*0*	*0*	*0*	*0*

Relatively little elk crucial year-long habitat and no calving grounds would be disturbed by Alternative WYCO-B compared to available elk habitat. Thus the alternative route is unlikely to adversely affect habitat availability or quality at a level that would influence the local elk population. Furthermore, elk migration corridors affected by Alternative WYCO-B are located in an area of existing disturbance, which suggests the local elk population is tolerant of, or has adapted to some level of anthropogenic disturbance during migration. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that elk use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in weeds, and an increase in human use and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence elk populations in the Project area.

The WYCO alternative routes cross mule deer sensitive habitat used by the Platte Valley herd (MD541), and the Baggs herd (MD247), which are important local wildlife resources. The MD541 population was estimated at 21,600 in 2009 to 2011, and the MD247 herd was estimated at 13,000 to 16,000 deer in 2011 (WGFD 2012a). Limiting factors to managed mule deer herds in Wyoming include disease and parasitic load, forage competition with elk, extreme long-term drought conditions, the quality and availability of severe winter range, and increased energy development (WGFD 2012a). Relatively small areas of mule deer habitat are disturbed compared to available mule deer habitat in Wyoming. However, mule deer tend to exhibit fidelity to seasonal home ranges and in their use of migration corridors, as the location and timing of seasonal movement patterns tends to be fairly consistent from year to year in many herds.

Increased energy development and infrastructure can reduce the effectiveness of mule deer migration corridors by restricting or disrupting animal movement during spring and fall migrations. The negative impacts of development can be greater in areas where migration corridors are either naturally or anthropogenically constricted (Sawyer et al. 2005). Migration corridors of the MD247 herd is constricted at two highway tunnel crossings in the vicinity of Baggs, Wyoming, which is subject to increased developmental pressure. However, mule deer often demonstrate the capacity to adapt to habitat alteration and anthropogenic disturbance (Mackie et al. 2003) and will continue to use established migration routes despite development pressure (Sawyer et al. 2005). Therefore, habitat use and migration routes could be affected by Alternative WYCO-B during Project construction and maintenance activities, but disruption is unlikely to be permanent given mule deer seasonal migration route and home range fidelity as well as their potential to tolerate anthropogenic disturbance.

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods and in sensitive habitats that include mule deer crucial winter range, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in weeds, and an increase in human use and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence mule deer populations in the Project area.

The WYCO alternative routes cross pronghorn crucial year-long habitat used by the Iron Springs herd (PR630) with a population estimated at approximately 10,000; the Baggs herd (PR438) with an estimated population of 8,100; and the Bitter Creek herd (PR414) with an average population of 7,531 in 2011 (WGFD 2012a). Pronghorn winter survival and recruitment are likely to be unaffected by Alternative WYCO-B in Wyoming, because fawning areas and severe winter habitat are not affected. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in weeds, human use and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence local pronghorn populations in the Project area. Furthermore, limitations on pronghorn movement by Alternative WYCO-B in Wyoming are likely to be temporary. Pronghorn migration routes often circumvent geographical barriers and bottlenecks (Baker 1978; Sawyer et al. 2005). Migration corridors affected by the alternative route are located in the I-80 corridor, which suggests the local pronghorn populations have previously accommodated concentrated and intense anthropogenic disturbance.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 would follow the same alignment through Wyoming. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming occur due to analysis methodology (Tables 3-81 through 3-85,

as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Colorado)

Alternative WYCO-B and route variations in Colorado cross mainly undisturbed habitat and a small area of agricultural land adjacent to the Yampa River. Dominant wildlife habitats are big sagebrush and shrub/shrub steppe, with smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian habitats with agriculture (Section 3.2.5.4). Slight variations occur in the routes of Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Colorado; in the Nine Mile Basin and Tuttle Ranch Conservation Easement areas. In Moffat County, Route Variation WYCO-B-2 would be located north of U.S. Highway 40 to bypass the Tuttle Ranch Conservation Easement. In contrast, Route Variation WYCO-B-3 would be located south of U.S. Highway 40, and colocated with an existing 345kV transmission line through the Tuttle Ranch Conservation Easement. Alternative WYCO-B and Route Variation WYCO-B-1 would run parallel to Route Variation WYCO-B-3 through the Tuttle Ranch Conservation Easement but would be offset from the existing 345kV transmission line by the standard 1,500 feet. Tuttle Ranch Conservation Easement is recognized by CPW as containing high-quality winter range and migratory routes for the largest elk and mule deer herds in Colorado (including the E-2 Bears Ears and E-6 White River elk herds), and also local pronghorn populations (CPW 2013a). Big game habitat south of U.S. Highway 40 in the Tuttle Ranch Conservation Easement is of higher value and importance for big game species than habitat north of U.S. Highway 40 (CPW 2013a).

Mammals

Big Game

Alternative WYCO-B in Colorado (Table 3-81) crosses elk nonlimiting range along the entire route, except for the last few miles near the Moffat/Rio Blanco county line. The alternative route (Table 3-82) crosses elk severe winter range, summer concentration areas, and calving grounds. The alternative route crosses the western edge of elk severe winter range, south of the Little Snake River and northwest of Maybell and the northern edge of an area close to Elk Springs Ridge (approximately 15 miles northeast of Massadona). This alternative route bisects two summer concentration areas, which also include calving grounds, north of the Little Snake River; and a summer concentration area (that encompass calving grounds) northwest of Maybell. These areas represent the eastern edge of summer concentration areas in Moffat County. The alternative route does not cross the three elk migration corridors between the Wyoming/Utah state line and Craig and Maybell; between Craig and Meeker, and east of Rangely.

Alternative WYCO-B in Colorado (Table 3-81) crosses mule deer nonlimiting range where the alternative route bisects the Little Snake and Yampa river valleys. The alternative in Colorado (Table 3-82) crosses the northernmost portion of mule deer critical winter range in Moffat County. The alternative does not cross summer concentration areas, crucial year-long habitat, or migration corridors (between Craig and Meeker).

Alternative WYCO-B in Colorado (Table 3-81) crosses pronghorn nonlimiting range along the entire route. The alternative in Colorado (Table 3-82) crosses pronghorn severe winter range north of the Little Snake River and northeast of Elk Springs Ridge. The alternative does not cross fawning areas, crucial year-long areas, or migration corridors.

Alternative WYCO-B in Colorado (Tables 3-81 and 3-82) does not cross moose or Rocky Mountain bighorn sheep sensitive habitat.

Environmental Consequences (Colorado)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer, and pronghorn populations by Alternative WYCO-B in Colorado would be low (Table 3-83).

Impacts on big game critical and severe habitat crossed by Alternative WYCO-B in Colorado would be low to nonidentifiable. Impacts on big game in Colorado would be expected to be similar in area and level for Alternatives WYCO-B, WYCO-C, and WYCO-F because the alternative routes follow the same alignment.

Results of Additional Analysis of Potential Impacts

Alternatives WYCO-B, WYCO-C, and WYCO-F follow the same alignment in Colorado. The estimated area of disturbance to elk nonlimiting range in Colorado for Alternative WYCO-B would be similar to that of Alternatives WYCO-C and WYCO-F, but considerably less than Alternative WYCO-D (Table 3-84). Slight variations in the estimated area of disturbance to elk calving grounds and crucial summer concentration areas; mule deer critical winter range and pronghorn severe winter range in Colorado also occur. Estimated area of disturbance to big game crucial habitat from Alternative WYCO-B would be considerably less than from WYCO-D (Table 3-85). Variations in the estimated area of disturbance occur due to analysis methodology as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Alternative WYCO-B crosses the western edge of elk severe winter range in Colorado, leaving the majority of severe winter range (located east of the alternative route) unaffected by the Project (Table 3-85). Similarly, summer concentration areas and calving grounds crossed by Alternative WYCO-B represent the eastern edge of a number of small undisturbed patches of range centered around Douglas Mountain and Diamond Peak in Moffat County. These areas are naturally bisected from relatively larger undisturbed range areas in Rio Blanco County and Routt County by the Little Snake and Yampa rivers. Alternative WYCO-B impacts the E-2 (Bears Ears) and the E-6 White River elk herds, which represent the largest elk herds in Colorado (CDOW 2005a). E-6 herd size is estimated at 41,500 with a current population objective of 28,500. E-2 is the second largest elk herd in the U.S. with a high profile and regional importance. Currently, E-2 herd size is estimated at 32,000 animals, although a recent model of carrying capacity conducted by the Habitat Partnership Program showed that carrying capacity for elk in the region was estimated at 16,500 (Finley and Grigg 2008). A limiting factor for elk is exceeding carrying capacity due to limited availability of crucial habitat or large population size. Therefore loss, alteration and fragmentation of elk severe winter range, summer concentration areas, and calving areas from Alternative WYCO-B could contribute to carrying capacity pressure on elk sensitive habitat in the Project area. However, the extent and magnitude of such impacts would be limited through application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) that would limit Project-related disturbance to these habitats during critical periods when elk use specific seasonal habitats.

Limiting factors to mule deer populations include the availability of crucial winter habitat and production areas necessary for long-term population viability (Sanchez-Rojas and Gallina-Tessaro 2008). The amount of mule deer critical winter range crossed by the alternative route is a relatively small area compared to larger areas of mule deer sensitive habitat in Moffat County and in Colorado as a whole that

are undisturbed by the Project. Additionally, no summer concentration areas or crucial year-long habitat are crossed, therefore Alternative WYCO-B is likely to have limited impact on mule deer reproduction. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that mule deer use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in weeds, human use and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely affect local mule deer populations in the Project area.

Alternative WYCO-B does not impact designated pronghorn fawning areas, or crucial year-long areas in Colorado, which are necessary for long-term population viability (Byers 2003). In addition displacement or disturbance of pronghorn populations on severe winter range resulting from Alternative WYCO-B are likely to be temporary, as a result of the application of seasonal and spatial restrictions (Selective Mitigation Measure 12) during times that pronghorn use specific seasonal habitats, which would limit loss of forage and restrict human use and activity in pronghorn sensitive habitat. Therefore the alternative route is unlikely to adversely impact local pronghorn populations in the Project area. Alternative WYCO-B also would not be anticipated to disrupt pronghorn movement in the Project area over the long-term, as pronghorn migration behavior is generally habitual; following the same geographical routes. In addition, migratory routes affected by the alternative route are already subject to anthropogenic disturbance, which may reduce migration areas but not necessarily effectiveness in facilitating pronghorn movement (Baker 1978).

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Slight variations occur in the estimated area of disturbance (in acres) to big game nonlimiting range; and critical and severe habitat from Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Colorado (Tables 3-81 through 3-85. Route Variation WYCO-B-2 would have the greatest impact of all the WYCO-B route variations on mule deer critical winter range, but the least impact on elk and pronghorn severe winter range. In the Tuttle Ranch Conservation Easement area, Route Variation WYCO-B-2 would be located north of U.S. Highway 40 and would avoid the Tuttle Ranch Conservation Easement. Alternative WYCO-B-2 would have the least impact on mapped elk nonlimiting range, but the greatest impact on mapped mule deer nonlimiting range and mapped high quality critical habitat north of the highway. Alternative WYCO-B and Route Variations WYCO-B-1 and WYCO-B-3 would have similar impacts on high value mapped elk severe habitat, but would avoid mapped mule deer critical habitat in the Tuttle Ranch Conservation Easement area. All WYCO-B route variations would affect designated pronghorn nonlimiting range similarly in the Tuttle Ranch Conservation Easement area.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C and route variations in Wyoming follow the same alignment as Alternative WYCO-B and route variations between the Aeolus substation and Wamsutter in Wyoming. Between Wamsutter and the Wyoming/Colorado state line, Alternative WYCO-C and route variations follow an existing pipeline corridor approximately 5 miles west of Alternative WYCO-B. Dominant habitat types are the same as those described for Alternative WYCO-B, and wildlife resources present and likely to be affected by Alternative WYCO-C and route variations are described at the beginning of Section 3.2.7.5.

Mammals

Big Game

Alternative WYCO-C in Wyoming (Table 3-81) crosses slightly more elk nonlimiting range, but the same amount of elk and mule deer crucial habitat as those previously identified for Alternative WYCO-B in

Wyoming. However, Alternative WYCO-C crosses marginally less pronghorn crucial year-long habitat and migration corridors than Alternative WYCO-B in Wyoming (Table 3-82). Most of the designated pronghorn migration routes in Sweetwater County are west of the alternative route (MV-9a). There is no difference in the number of miles of big game nonlimiting range and crucial habitat crossed by Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming.

Environmental Consequences (Wyoming)

Alternative WYCO-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative WYCO-C in Wyoming would be low (Table 3-83).

Impacts on big game sensitive habitat crossed by Alternative WYCO-C in Wyoming are primarily nonidentifiable, with some areas of low impacts. For a comparison of impacts between WYCO alternative routes in Wyoming refer to the discussion of Alternative WYCO-B presented above.

Results of Additional Analysis of Potential Impacts

Greater estimated area of disturbance (in acres) to elk, mule deer and pronghorn nonlimiting range, but slightly less disturbance to moose nonlimiting range would occur from Alternative WYCO-C compared to Alternative WYCO-B (Table 3-84). Slight variations also occur in the estimated area of disturbance to big game crucial habitat between Alternative WYCO-C and Alternative WYCO-C (Table 3-85). After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that elk, mule deer and pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in weeds, human use and activity in these habitats due to construction of new access routes. Alternative WYCO-C would not be expected to adversely influence local elk, mule deer and pronghorn populations in the Project area in Wyoming. Impacts on big game populations in Wyoming from Alternative WYCO-C would be similar to those described for Alternative WYCO-B.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 would follow the same alignment through Wyoming. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming occur due to analysis methodology (Tables 3-84 and 3-85), as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Colorado)

The affected environment for Alternative WYCO-C and route variations in Colorado would be the same as Alternative WYCO-B and route variations in Colorado, as the two routes follow the same route through the state. Slight variations occur in the number of miles of big game nonlimiting range and crucial habitat crossed by Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Colorado (Tables 3-81 and 3-82).

Environmental Consequences (Colorado)

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative WYCO-C and route variations in Colorado would be the same as Alternative WYCO-B and route variations as the two routes follow the same alignment through the state. Refer to Alternative WYCO-B presented above for a discussion of the environmental consequences and potential impacts.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D and Route Variation WYCO-D-1 follow the same alignment through Wyoming, and run east of Hanna close to an existing transmission line and wind farm. East of Hanna, the alternative route follows the same alignment as Alternative WYCO-B, WYCO-C, and WYCO-F to Wamsutter. The alternative route is farther east than the other WYCO alternative routes and follows Wyoming Highway 789 to Baggs through existing gas and oil development areas, and riparian habitat at Baggs. Dominant habitat types are the same as those described for Alternative WYCO-B, and wildlife resources present and likely to be affected by this alternative route are described at the beginning of Section 3.2.7.5.

Mammals

Big Game

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming cross more elk nonlimiting range habitat, but less mule deer and pronghorn nonlimiting range habitat than other WYCO alternative routes (Table 3-81). Alternative WYCO-D in Wyoming crosses less elk migration corridors, but more mule deer and pronghorn crucial winter/year-long range habitats than other WYCO alternative routes where it diverges along Wyoming Highway 789 north of Baggs and along the Wyoming/Colorado state line (Table 3-82 and MV-9a).

Environmental Consequences (Wyoming)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative WYCO-D in Wyoming would be low (Table 3-83).

Impacts on big game sensitive habitat crossed by Alternative WYCO-D in Wyoming would be nonidentifiable or low. For a comparison of impacts between WYCO alternative routes in Wyoming refer to Alternative WYCO-B.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance by Alternative WYCO-D and Route Variation WYCO-D-1 would be greater for elk and moose nonlimiting range, but less for mule deer and pronghorn nonlimiting range than for other WYCO alternative routes in Wyoming (Table 3-84). The location of disturbance corresponds to sensitive habitat crossed by the alternative route and is discussed under Affected Environment for

Alternative WYCO-D. The estimated area of disturbance to elk crucial habitat by Alternative WYCO-D (Table 3-85) would be less than other WYCO alternative routes, and would only impact elk migration corridors. The estimated area of disturbance to mule deer and pronghorn crucial winter/year-long range would be greater than all other WYCO alternative routes in Wyoming. However, mule deer and pronghorn crucial year-long habitats and migration corridors are located in areas of existing disturbance, which suggests any potential disturbance from Alternative WYCO-D on mule deer and pronghorn populations may be more pronounced in the short-term during Project construction, than in the long-term during maintenance. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that elk, mule deer and pronghorn use specific seasonal habitats, impacts from Alternative WYCO-D in Wyoming would be limited to minor loss of forage, a potential increase in weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence elk, mule deer and pronghorn populations in the Project area.

Alternative WYCO-D Route Variation (WYCO-D-1)

Alternative WYCO-D and Route Variation WYCO-D-1 would follow the same alignment through Wyoming. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming occur due to analysis methodology (Tables 3-84 and 3-85), as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Colorado)

Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado follow a different alignment than all other WYCO alternative routes in Colorado, heading south along Colorado State Highway 13 to Craig, then west along U.S. Highway 40 and an existing transmission line before converging with all other WYCO alternative routes south of Maybell. Total mileage of Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado are twice that of all other WYCO alternative routes in the state. Dominant habitat types are the same as those described for Alternative WYCO-B in Colorado but also include agricultural land. Wildlife resources present and likely to be affected by this alternative route are described at the beginning of Section 3.2.7.5. Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado follow a different alignment through the Tuttle Ranch Conservation Easement area.

Mammals

Big Game

There is no difference in the number of miles of big game nonlimiting range and crucial habitat crossed by Alternative WYCO-D and WYCO-D-1 in Colorado (Tables 3-81 and 3-82). Almost the entire length of Alternative WYCO-D crosses elk, mule deer and pronghorn nonlimiting range and more of these habitats are crossed compared to the other WYCO alternative routes in Colorado (Table 3-81). The alternative also crosses more elk severe winter range and elk migration corridors than other WYCO alternative routes (Table 3-81). Elk severe winter range and migration corridors overlap in the state. Alternative WYCO-D in Colorado crosses more mule deer critical winter range located west of Black Mountain and west of Craig (Table 3-82), and more pronghorn severe winter range close to the Wyoming/Colorado state line and west of Craig than all the other WYCO alternative routes.

Environmental Consequences (Colorado)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative WYCO-D in Colorado would be low (Table 3-83).

Impacts on big game sensitive habitat crossed by Alternative WYCO-D in Colorado would be low. For a comparison of impacts between WYCO alternative routes in Colorado refer to the discussion of Alternative WYCO-B.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance by Alternative WYCO-D and Route Variation WYCO-D-1 would be considerably greater for big game nonlimiting range in Colorado (Table 3-84). The estimated area of disturbance to critical and severe big game habitat from Alternative WYCO-D is considerably more that from other WYCO alternative routes (Table 3-85). The elk severe winter range crossed by Alternative WYCO-D supports one of the largest concentrations of elk in the north of the state. However, severe winter range and migration corridors crossed by the alternative route are located in areas of existing disturbance, which suggests local elk populations are tolerant of or have adapted to anthropogenic activity. Therefore any disturbance from Alternative WYCO-D to local elk populations is likely to be temporary. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods, impacts would be limited to minor loss of forage, a potential increase in weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence elk populations in the Project area.

The magnitude of potential impacts is likely to be a function of the large amount of mule deer critical winter range and pronghorn severe winter range crossed by Alternative WYCO-D in Colorado, which is twice that of all other WYCO alternative routes in the state. Mule deer critical winter range and pronghorn severe winter range are located close to U.S. Highway 40 and an existing transmission line. Therefore potential disturbance from Alternative WYCO-D to mule deer and pronghorn populations in Colorado is likely to be temporary. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods, impacts from Alternative WYCO-D in Colorado would be limited to minor loss of forage, a potential increase in weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence local mule deer populations in the Project area.

Alternative WYCO-D Route Variation (WYCO-D-1)

Slight variations occur in the estimated area of disturbance (in acres) to big game nonlimiting range and crucial habitat from Alternative WYCO-D and Route Variation WYCO-D-1 (Tables 3-84 and 3-85). In the Tuttle Ranch Conservation Easement area, Alternative WYCO-D and Route Variation WYCO D-1 would follow the same route as Alternative WYCO-B and Route Variation WYCO-B-3 respectively, and impacts on designated big game nonlimiting range and crucial habitat would be the same as for Alternative WYCO-B and Route Variation WYCO-B-3 in the Tuttle Ranch Conservation Easement area. Alternative WYCO-D and Route Variation WYCO-D-1 would have similar impacts on high value

mapped elk severe habitat, but would avoid mapped mule deer critical habitat in the Tuttle Ranch Conservation Easement area.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 follow the same alignment through Wyoming and the same route as Alternative WYCO-B between the Aeolus substation and Wamsutter. Between Wamsutter and the Wyoming/Colorado state line, the alternative route and route variations cross shrub/shrub-steppe and sagebrush habitats that have been previously disturbed by Wyoming Highway 789 and energy development east of Flat Top Mountain. Dominant habitat types are the same as those described for Alternative WYCO-B in Wyoming, and wildlife resources present and likely to be affected by this alternative route and route variations are described at the beginning of Section 3.2.7.5.

Mammals

Big Game

Alternative WYCO-F in Wyoming generally crosses similar amounts of elk, mule deer and pronghorn nonlimiting range and crucial habitat as Alternative WYCO-B in Wyoming (Tables 3-81 and 3-82). However, Alternative WYCO-F in Wyoming crosses more mule deer crucial year-long habitat and migration corridors west of Baggs close to the Wyoming/Colorado state line, and more pronghorn migration corridors and crucial year-long habitat approximately 20 miles southeast of Wamsutter than Alternative WYCO-B. There is no difference in the number of miles of big game nonlimiting range and crucial habitat crossed by Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2 and WYCO-F-3 in Wyoming.

Environmental Consequences (Wyoming)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative WYCO-F in Wyoming would be low (Table 3-83).

Impacts on big game sensitive habitat crossed by Alternative WYCO-F in Wyoming would be nonidentifiable to low. For a comparison of impacts between WYCO alternative routes in Wyoming refer to the discussion of Alternative WYCO-B.

Results of Additional Analysis of Potential Impacts

Alternative WYCO-F would have the least estimated area of disturbance on elk nonlimiting range in Wyoming compared to other WYCO alternative routes (Table 3-84). Alternative WYCO-F would have similar estimated area of disturbance for mule deer, pronghorn and moose nonlimiting range compared to Alternatives WYCO-B and WYCO-C. The estimated area of disturbance to critical and severe big game habitat from Alternative WYCO-F is similar to Alternatives WYCO-B and WYCO-C, and considerably less than Alternative WYCO-D (Table 3-85). After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts resulting from Alternative WYCO-F in Wyoming would be limited to minor loss of forage, a potential increase in weeds, human presence and activity in these habitats due to

construction of new access routes. These effects are not anticipated to adversely influence elk, mule deer and pronghorn populations in the Project area.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 would follow the same alignment through Wyoming. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming occur due to analysis methodology (Tables 3-84 and 3-85), as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Colorado)

The affected environment for Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado would be the same as Alternative WYCO-B and WYCO-B route variations in Colorado (Tables 3-81 and 3-82, as the two routes follow the same alignment through the state. Slight variations occur in the number of miles of big game nonlimiting range and crucial habitat crossed by Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado.

Environmental Consequences (Colorado)

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative WYCO-F and route variations in Colorado would be the same as Alternative WYCO-B and route variations (Tables 3-84 and 3-85) as the two routes follow the same alignment through the state. Refer to Alternative WYCO-B presented above for a discussion of the environmental consequences and potential impacts.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Environmental Setting

The COUT BAX alternative routes are located predominantly in the Colorado Plateaus Ecoregion but cross into the Wasatch and Uinta Mountains Ecoregion, and the Central Basin and Range Ecoregion as they approach Mona, Utah (Section 3.2.7.3). Wildlife habitats crossed by COUT BAX alternative routes are dominated by grasslands, shrub/shrub steppe, big sagebrush, pinyon-juniper, barren/sparsely vegetated, and developed/disturbed vegetation types through the southeastern portion of the Project area (Colorado and eastern Utah) and montane forest, aspen, and mountain shrub in the western portion of the Project area (Manti-La Sal National Forest). For details on dominant plant communities that provide wildlife habitat in this area, refer to Section 3.2.5.4. These habitat types are potentially suitable habitat for a variety of migratory bird species. For a list of BCC and PIF migratory birds and their breeding habitats within Colorado and Utah that are likely to occur throughout the Project area refer to Appendix E, Table E-6.

From U.S. Highway 40 approximately 2 miles east of Massadona, the three COUT BAX alternative routes cross into Rio Blanco County over Coal Ridge, over the White River, and follow Colorado State Highway 64 south to Rangely. All alternative routes turn southwest and follow County Road 23, east of the Rabbit and Park Mountains, then cross Texas, Missouri, and Evacuation creeks to follow the Utah/Colorado state line south. The alternative routes follow Whiskey Creek south into Garfield County, cross over Baxter Pass, and turn south following Colorado State Highway 201 into Mesa County and along Otto's Ridge west of Mack. All alternative routes follow an existing pipeline southwest in to Utah. In Utah, the three alternative routes follow U.S. Highway 50 and I-70 into Grand County, through

existing oil and gas fields toward Cisco. They continue west along the I-70 corridor before crossing Little Valley Bad Lands and the Green River 3 miles south of the town of Green River. After crossing I-70, the alternative routes diverge in Emery County. Alternative COUT BAX-B follows an existing 345kV transmission line south of Cedar Mountain. Alternatives COUT BAX-C and COUT BAX-E follow U.S. Highway 6 and an existing 138kV transmission line north. Alternative COUT BAX-C crosses Dry Mesa and rejoins COUT BAX-B south of Cedar Mountain following the north rim of Buckhorn Wash toward Castle Dale and Huntington, parallel with existing power lines before crossing into USFS-administered land, over East Mountain into Sanpete County, and the Manti-La Sal National Forest. Alternatives COUT BAX-B and COUT BAX-C follow an existing power line and Utah State Route 132 along the Sanpete Valley north of Nephi to Mona. In contrast, Alternative COUT BAX-E continues north (approximately 17 miles northwest of Green River) and turns west along the Carbon/Emery county line, north of Elmo. Alternative COUT BAX-E turns north through existing gas fields west of Price and then west across the Manti-La Sal National Forest approximately 2 miles south of Lower Gooseberry Reservoir. Alternative COUT BAX-E then runs west, north of Fairview and rejoins Alternatives COUT BAX-B and COUT BAX-C north of Fountain Green.

In Colorado, elk nonlimiting range is located between Massadona and Rangely, and between the East Tavaputs Plateau and Grand Valley. An isolated patch of elk severe winter range is located in the vicinity of Meeker. The largest continuous area of elk severe winter range is located in Moffat County, and stretches north east from Rangely toward Maybell, then east toward Craig. Severe winter range and summer concentration areas are located south of the Wyoming/Colorado state line, west of Maybell and Craig, east of Fruita, and north of Grand Junction and the Grand Mesa National Forest. Summer range is located between Craig and Meeker. Elk migration corridors occur between Craig and Maybell, and between Craig and Meeker. In Utah, elk nonlimiting range occurs on the Manti-La Sal National Forest. Elk crucial spring/fall habitat is located on the Manti-La Sal National Forest west of Fountain Green. Elk crucial summer habitat is located on Manti-La Sal National Forest. Elk crucial winter habitat is located along the Utah/Colorado state line west of Grand Junction, west of Price, and along the mountain foothills from Nephi south to Cedar City. Elk crucial year-long is located between East Tavaputs Plateau and Grand Valley, along the Roan Cliffs, and on West Tavaputs Plateau (MV-8b).

In Colorado, mule deer nonlimiting range is located along the White River in the vicinity of Rangely. Mule deer critical winter range is located from Meeker west to the Colorado/Utah state line. Mule deer migration corridors occur between Craig and Meeker. In Utah, mule deer nonlimiting range occurs along the Green and Price rivers, and in the vicinity of Huntington. Mule deer crucial spring/fall habitat is located on Manti-La Sal National Forest. Crucial summer range, which encompasses important fawning habitats, is widely distributed throughout the Project area and in the vicinity of Thistle. Crucial winter habitat is located west of Price, between the East Tavaputs Plateau and Grand Valley, and along mountain foothills on the Manti-La Sal National Forest. Mule deer crucial winter/spring habitat occurs on the periphery of the Manti-La Sal National Forest and west of Mona. Crucial year-long habitat is located in the Cedar Mountain area. UDWR has not delineated any mule deer migration corridors (MV-9b).

In Colorado, pronghorn nonlimiting range is located between Massadona and Rangely, along the Moffat/Rio Blanco county line; and in Grand Valley. Pronghorn severe winter range is located west of Craig and in the vicinity of Maybell. In Utah, pronghorn nonlimiting range is located north of I-70 and west of Green River in the Book Cliffs area, and in the Castle Valley area. Pronghorn crucial year-long habitat is located along the I-70 corridor between Green River and the Utah/Colorado state line in the vicinity of Price (MV-9b).

In Utah, moose nonlimiting range, crucial winter and crucial year-long habitat occur in the Manti-La Sal National Forest. Crucial year-long habitat for the Rocky Mountain bighorn sheep occurs in east central Utah in the Book Cliffs range and East Tavaputs Plateau. Desert bighorn sheep nonlimiting range is

located south of Green River. Crucial year-long habitat for the desert bighorn sheep occurs in two main areas, east of the Green River in Grand County in the vicinity of Arches and Canyonlands national parks and Moab and in Emery County in the vicinity of the San Rafael Swell, Mexican Mountain, and Buckhorn Wash (MV-9b).

Alternative COUT BAX-B

Affected Environment (Colorado)

Mammals

Big Game

The extent of big game nonlimiting range and crucial habitat crossed by each alternative route is displayed in Tables 3-86 and 3-87 and MV-8b and MV-9b.

Alternative COUT BAX-B in Colorado crosses elk nonlimiting range between the Rio Blanco county line and Rangely, and between the East Tavaputs Plateau and close to the Utah/Colorado state line. The alternative route crosses elk severe winter range on the Moffat/Rio Blanco county line at Coal Ridge and along the Book Cliffs on the Garfield/Mesa county line. This alternative route crosses elk summer concentration areas at Coal Ridge and also where they overlap calving grounds at Baxter Pass. Alternative COUT BAX-B in Colorado crosses mule deer nonlimiting range on the East Tavaputs Plateau south of the White River, and in the Grand Valley. A large portion of mule deer severe winter range is crossed by the alternative route between the Moffat/Rio Blanco county line at Coal Ridge and Rabbit Mountain and also along the Book Cliffs. Pronghorn nonlimiting range is crossed on the Moffat/Rio Blanco county line and in the Grand Valley. Pronghorn severe winter range is crossed on Otto's Ridge north of U.S. Highway 6 in Colorado.

TABLE 3-86
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Nonlimiting Range[2] (miles crossed)					
		Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
COUT BAX-B	279.2	24.7	28.8	46.1	17.6	5.3	0.0
Colorado	*86.7*	*19.3*	*26.6*	*21.1*	*0.0*	*0.0*	*0.0*
Utah	*192.5*	*5.4*	*2.2*	*25.0*	*17.6*	*5.3*	*0.0*
COUT BAX-C	289.7	24.7	28.8	55.8	17.6	5.3	0.0
Colorado	*86.7*	*19.3*	*26.6*	*21.1*	*0.0*	*0.0*	*0.0*
Utah	*203.0*	*5.4*	*2.2*	*34.7*	*17.6*	*5.3*	*0.0*
COUT BAX-E	291.5	20.1	32.5	50.1	23.1	5.3	0.0
Colorado	*86.7*	*19.3*	*26.6*	*21.1*	*0.0*	*0.0*	*0.0*
Utah	*204.8*	*0.8*	*5.9*	*29.0*	*23.1*	*5.3*	*0.0*

NOTES:
[1]Each of the big game species will not add to the total miles column due to the overlapping habitats.
[2]Includes all designated habitat in Colorado and Utah except habitat in Table 3-87

TABLE 3-87
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Big Game Crucial Habitat (miles crossed)																				
		Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall	Severe Winter Range	Crucial Year-long	Crucial Year-long
COUT BAX-B	279.2	4.8	0.0	29.5	40.6	0.0	0.0	3.6	15.8	69.2	3.0	0.0	0.0	79.4	4.4	79.4	0.0	0.6	0.0	17.2	0.6	0.0
Colorado	*86.7*	*4.8*	*0.0*	*11.1*	*8.6*	*0.0*	*0.0*	*0.0*	*0.0*	*41.8*	*0.0*	*0.0*	*0.0*	*0.0*	*4.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah[1]	*192.5*	*0.0*	*0.0*	*18.4*	*32.0*	*0.0*	*–*	*3.6*	*15.8*	*27.4*	*3.0*	*0.0*	*–*	*79.4*	*0.0*	*79.4*	*–*	*0.6*	*0.0*	*17.2*	*0.6*	*0.0*
COUT BAX-C	289.7	4.8	0.0	29.5	40.6	0.0	0.0	3.6	15.8	69.2	3.0	0.0	0.0	79.6	4.4	79.6	0.0	0.6	0.0	17.2	0.6	0.0
Colorado	*86.7*	*4.8*	*0.0*	*11.1*	*8.6*	*0.0*	*0.0*	*0.0*	*0.0*	*41.8*	*0.0*	*0.0*	*0.0*	*0.0*	*4.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah[1]	*203.0*	*0.0*	*0.0*	*18.4*	*32.0*	*0.0*	*–*	*3.6*	*15.8*	*27.4*	*3.0*	*0.0*	*–*	*79.6*	*0.0*	*79.6*	*–*	*0.6*	*0.0*	*17.2*	*0.6*	*0.0*
COUT BAX-E	291.5	4.8	0.0	25.9	63.8	0.0	0.0	2.7	14.8	77.1	5.9	0.0	0.0	91.0	4.4	95.0	0.0	1.0	0.0	14.8	1.0	0.0
Colorado	*86.7*	*4.8*	*0.0*	*11.1*	*8.6*	*0.0*	*0.0*	*0.0*	*0.0*	*41.8*	*0.0*	*0.0*	*0.0*	*0.0*	*4.4*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah[1]	*204.8*	*0.0*	*0.0*	*14.8*	*55.2*	*0.0*	*–*	*2.7*	*14.8*	*35.3*	*5.9*	*0.0*	*–*	*91.0*	*0.0*	*95.0*	*–*	*1.0*	*0.0*	*14.8*	*1.0*	*0.0*

NOTE: [1]Mapped data for elk, mule deer, and pronghorn migration corridors were unavailable for the state of Utah.

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT BAX-B in Colorado would be low (Table 3-88). Initial impacts on wildlife resources are determined through the implementation of seasonal wildlife restrictions on construction and maintenance activities within the Project area. The BLM and other agencies may grant exceptions to seasonal wildlife restrictions. However, any exceptions would increase the initial level of impacts on wildlife resources and potentially result in greater residual impacts.

Impacts on big game under Alternative COUT BAX-B in Colorado would be primarily low and nonidentifiable in some areas. Impacts on big game in Colorado would be the same for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E.

TABLE 3-88
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

		Big Game Crucial Habitat (miles crossed)			
Alternative Route	**Total Miles**	**Nonidentifiable**	**Low**	**Moderate**	**High**
COUT BAX-B	279.2	91.6	187.6	0.0	0.0
Colorado	*86.7*	*30.2*	*56.5*	*0.0*	*0.0*
Utah	*192.5*	*61.4*	*131.1*	*0.0*	*0.0*
COUT BAX-C	289.7	101.9	187.8	0.0	0.0
Colorado	*86.7*	*30.2*	*56.5*	*0.0*	*0.0*
Utah	*203.0*	*71.7*	*131.3*	*0.0*	*0.0*
COUT BAX-E	291.5	79.6	211.9	0.0	0.0
Colorado	*86.7*	*30.2*	*56.5*	*0.0*	*0.0*
Utah	*204.8*	*49.4*	*155.4*	*0.0*	*0.0*

NOTES: Includes impacts on elk, mule deer, pronghorn, moose, and Rocky Mountain bighorn sheep seasonal habitats.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance to big game populations in Colorado resulting from Alternative COUT BAX-B is similar to disturbance from the other COUT BAX alternative routes because the alternative routes follow the same alignment through the state (Tables 3-89 and 3-90). Alternative COUT BAX-E would have the most impact on nonlimiting range but the least impact on big game crucial habitat in Colorado.

TABLE 3-89
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Big Game Nonlimiting Range (acres)					
	Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
COUT BAX-B	426	496	794	303	91	0
Colorado	*333*	*458*	*363*	*0*	*0*	*0*
Utah	*93*	*38*	*431*	*303*	*91*	*0*
COUT BAX-C	418	487	944	298	90	0
Colorado	*327*	*450*	*357*	*0*	*0*	*0*
Utah	*91*	*37*	*587*	*298*	*90*	*0*
COUT BAX-E	330	534	823	379	87	0
Colorado	*317*	*437*	*347*	*0*	*0*	*0*
Utah	*13*	*97*	*476*	*379*	*87*	*0*

Alternative COUT BAX-B crosses sensitive habitat used by the E-10 Yellow Creek elk herd, which has an estimated population size of 8,700 animals. Limiting factors identified for the E-10 herd include quality of winter range due to competition for browse with native ungulates, domestic livestock and wild horses; and an exponential increase in oil and gas development in the area (CDOW 2006). However, the E-10 population has increased steadily over time. The small area of elk severe winter range crossed by Alternative COUT BAX-B is located in an area of existing disturbance that was previously bisected by Colorado State Highway 64 and existing transmission lines. Therefore, further disturbance or displacement of individuals resulting from the alternative route would be temporary, as local populations appear to be tolerant of or have adapted to existing development in their range. In addition, the area of severe winter range along the Book Cliffs, and the calving grounds at Baxter Pass crossed by Alternative COUT BAX-B lie on the western edge of considerable elk range available in the state.

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods, impacts on elk by Alternative COUT BAX-B would be limited to minor loss of forage in seasonal habitat areas, and a reduction in potential public access to these habitats. These effects are not anticipated to adversely influence elk populations in the Project area.

Alternative COUT BAX-B crosses range used by the D-11 Bookcliffs mule deer herd with an estimated population of 8,600 deer (CDOW 2005b). The D-11 population has been in a steady decline since 1990, and limiting factors include competition with an increasing elk population, long-term drought, loss and degradation of sensitive habitat, and an increase in energy development and human activity. In addition, mule deer herds may have reached carrying capacity of available critical winter range. The mule deer critical winter range crossed by Alternative COUT BAX-B is located in an area of existing disturbance in Rio Blanco County that was previously divided by Colorado State Highways 64 and 139 and existing transmission lines. However, mule deer habitat is well connected by migration corridors to adjacent areas of critical winter range undisturbed by the Project. In addition, mule deer severe winter range along the Book Cliffs represents the western edge of extensive range that stretches 150 miles to Grand County. Impacts on mule deer by Alternative COUT BAX-B would be minimized by the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods. Impacts would be limited to minor loss of forage in seasonal habitat areas, a reduction in the potential spread of weeds, and a reduction in potential human use and activity in these habitats, and are not anticipated to adversely influence local mule deer populations in the Project area.

TABLE 3-90
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																				
	Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Spring/Fall Range	Crucial/Summer, Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial/Summer, Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall	Severe Winter Range	Crucial Year-long	Crucial Year-long
COUT BAX-B	83	0	508	699	0	0	62	272	1,192	52	0	0	1,368	76	1,368	0	10	0	296	10	0
Colorado	*83*	*0*	*191*	*148*	*0*	*0*	*0*	*0*	*720*	*0*	*0*	*0*	*0*	*76*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*317*	*551*	*0*	*–*	*62*	*272*	*472*	*52*	*0*		*1,368*	*0*	*1,368*	*–*	*10*	*0*	*296*	*10*	*0*
COUT BAX-C	81	0	499	687	0	0	61	267	1,171	51	0	0	1,347	74	1,347	0	10	0	291	10	0
Colorado	*81*	*0*	*188*	*145*	*0*	*0*	*0*	*0*	*707*	*0*	*0*	*0*	*0*	*74*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*311*	*542*	*0*	*–*	*61*	*267*	*464*	*51*	*0*	*–*	*1,347*	*0*	*1,347*	*–*	*10*	*0*	*291*	*10*	*0*
COUT BAX-E	79	0	425	1,048	0	0	44	243	1,267	97	0	0	1,495	72	1,560	0	16	0	243	16	0
Colorado	*79*	*0*	*182*	*141*	*0*	*0*	*0*	*0*	*687*	*0*	*0*	*0*	*0*	*72*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*243*	*907*	*0*	*–*	*44*	*243*	*580*	*97*	*0*	*–*	*1,495*	*0*	*1,560*	*–*	*16*	*0*	*243*	*16*	*0*

NOTE: [1] Mapped data for elk, mule deer, and pronghorn migration corridors were unavailable for the state of Utah.

Pronghorn crucial winter range crossed by Alternative COUT BAX-B in Mesa County, Colorado, represents the eastern edge of crucial winter range that runs north along the I-70 corridor to the Green River in Utah. Limiting factors for pronghorn include the availability of crucial winter habitat and fawning areas. Impacts on pronghorn populations and habitat by the alternative route in Colorado would be minimized by the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12). Impacts would be limited to minor loss of forage in seasonal habitat areas, a reduction in the potential spread of weeds, and a reduction in potential human presence and activity in these habitats due to construction of access roads, and are not anticipated to adversely influence local pronghorn populations in the Project area.

Affected Environment (Utah)

Mammals

Big Game

The extent of big game nonlimiting range and crucial habitat crossed by each alternative route is displayed in Tables 3-86 and 3-87 and in MV-8b and MV-9b.

Most elk, mule deer and moose habitats occur in higher elevations in Utah. Alternative COUT BAX-B in Utah crosses elk nonlimiting range in the vicinity of East Mountain on Manti-La Sal National Forest. The alternative route crosses elk crucial winter range along the I-70 corridor, west of the Colorado/Utah state line, and north of the Colorado River and Arches National Park. Smaller areas of elk crucial winter range are crossed on the east slopes of Sanpete Valley and Cedar Hills and San Pitch Mountains in the Uinta National Forest. The alternative route crosses elk summer concentration areas at East Mountain in the Manti-La Sal National Forest. The alternative does not cross elk calving grounds or crucial year-long habitat.

Alternative COUT BAX-B crosses mule deer nonlimiting range along the Green River and in the vicinity of Huntington. The alternative route crosses mule deer crucial winter range, mule deer spring/fall habitat, and summer concentration areas on Manti-La Sal National Forest. Alternative COUT BAX-B also crosses mule deer crucial winter/spring habitat east of Mount Pleasant.

Alternative COUT BAX-B crosses pronghorn nonlimiting range between I-70 and Cedar Mountain. The alternative route crosses pronghorn crucial year-long habitat and fawning areas that overlap in Utah. One area of crucial year-long/fawning habitat extends from the Utah/Colorado state line along the I-70 corridor to the Green River and the other area is in the vicinity of Buckhorn Wash. This alternative route does not cross pronghorn crucial winter range.

Alternative COUT BAX-B in Utah crosses moose nonlimiting range and crucial winter range on Manti-La Sal National Forest. The alternative route crosses desert bighorn sheep nonlimiting range east of Green River, but does not cross either Rocky Mountain bighorn sheep or desert bighorn sheep crucial habitat. However, the alternative route would be located within 1 mile of Rocky Mountain bighorn sheep habitat at higher elevations of the southern edge of the Book Cliffs Range. Similarly, desert bighorn sheep year-long habitat is also located within 1 mile of the alternative route, which extends to the northern edge of the San Rafael Reef.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT BAX-B in Utah would be low (Table 3-88).

Impacts on big game under Alternative COUT BAX-B in Utah would be primarily low, with some nonidentifiable impacts (Table 3-88). Impacts on big game in Utah would be similar between Alternatives COUT BAX-B and COUT BAX-C.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance to big game populations in Utah by Alternative COUT BAX-B is similar to Alternative COUT BAX-C (Tables 3-89 and 3-90).

The majority of elk, mule deer and moose crucial habitat in Utah are located north of Alternative COUT BAX-B. In contrast, the majority of pronghorn crucial year-long/fawning habitat in Utah is located west of Interstate 15 (I-15). However, all elk, mule deer, pronghorn and moose habitat that is crossed by Alternative COUT BAX-B is subject to pre-existing road and transmission line disturbance.

The COUT BAX alternative routes cross crucial habitat used by the Central Mountains elk herd with an estimated population of 12,600 elk, which is currently higher than management objectives (UDWR 2012a). Limiting factors to local elk herds include drought conditions, energy development and urban expansion, alteration and fragmentation of habitat, and competition for forage with domestic livestock (UDWR 2012a). Similarly the Central Mountains mule deer herd with a current population size of 60,600 is affected by the alternative routes. Limiting factors for the Central Mountains mule deer herd include the poor condition of winter range due to drought conditions (UDWR 2006c).

The COUT BAX alternative routes follow I-70 along the southern edge of extensive pronghorn crucial year-long habitat that extends approximately 70 miles from the Colorado/Utah state line to the Green River. The range includes an area of oil and gas development north west of Cisco, and agricultural land east of Green River. A large area of pronghorn crucial year-long habitat, affected by alternative COUT BAX-B, is located at Buckhorn Wash and is potentially isolated geographically by the Book Cliffs in the north from extensive habitat in the vicinity of Vernal. Preliminary studies suggest oil and gas development is a potential limiting factor to local pronghorn populations, and may disrupt migration routes and alter pronghorn winter range use (Sawyer et al. 2002). Disturbance or displacement of elk, mule deer and pronghorn populations in Utah as a result of Alternative COUT BAX-B would be minimized by the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats. Impacts would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative

COUT BAX-B could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT BAX-C

Affected Environment (Colorado)

The affected environment for Alternative COUT BAX-C in Colorado would be the same as Alternative COUT BAX-B in Colorado (Tables 3-86 and 3-87), as the two alternative routes follow the same alignment through the state, and cross similar resources.

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT BAX-C in Colorado would be the same as Alternative COUT BAX-B (Table 3-88) as the two alternative routes follow the same alignment through the state.

Affected Environment (Utah)

The affected environment for Alternative COUT BAX-C in Utah would be similar to Alternative COUT BAX-B in Utah (Tables 3-86 and 3-87), as the two alternative routes follow similar alignments through the state.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT BAX-C in Utah would be similar to Alternative COUT BAX-B (Table 3-88) as the two alternative routes follow similar alignments through the state.

Results of Additional Analysis of Potential Impacts

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT BAX-C would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes (Tables 3-89 and 3-90). These effects are not anticipated to adversely influence big game populations in the Project area in Utah. For additional analysis of impacts on big game populations in Utah resulting from Alternative COUT BAX-C, refer to Alternative COUT BAX-B.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-B could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT BAX-E

Affected Environment (Colorado)

The affected environment for Alternative COUT BAX-E would be the same as Alternative COUT BAX-B in Colorado (Tables 3-86 and 3-87), as the two alternative routes follow the same alignment through the state.

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT BAX-E in Colorado would be the same as Alternative COUT BAX-B (Tables 3-87 and 3-88) as the two alternative routes follow the same alignment through the state.

Affected Environment (Utah)

Mammals

Big Game

Alternative COUT BAX-E in Utah crosses more mule deer nonlimiting range along Price River and the Carbon/Emery county line, and more moose nonlimiting range on the Manti-La Sal National Forest than other COUT BAX alternative routes (Table 3-86). Alternative COUT BAX-E in Utah also crosses more elk and mule deer crucial spring/fall, winter and winter/spring range on Manti-la Sal National Forest than all other COUT BAX alternative routes (Table 3-87). This alternative route crosses more pronghorn fawning areas and crucial year-long habitat than all other COUT BAX alternative routes. The pronghorn crucial year-long habitat crossed by the Alternative COUT BAX-E is located in the Castle Valley area, between Utah State Route 10 and U.S. Highway 6 in existing oil or gas fields.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT BAX-E in Utah would be low (Table 3-88)

Impacts on big game under Alternative COUT BAX-E in Utah would be primarily low, with some areas of nonidentifiable impacts (Table 3-88). Impacts on big game in Utah would be higher from Alternative COUT BAX-E than all other COUT BAX alternative routes.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance to elk nonlimiting range in Utah (Table 3-89) from Alternative COUT BAX-E is considerably less than the other COUT BAX alternative routes, but would affect mule deer, and moose nonlimiting range considerably more than the other COUT BAX alternative routes. Alternative COUT BAX-E would disturb twice as much elk crucial winter habitat, but less elk summer concentration areas than other COUT BAX alternative routes (Table 3-90). Alternative COUT BAX-E would affect more pronghorn fawning areas and crucial year-long habitat than other COUT BAX alternative routes in Utah. Alternative COUT BAX-E would disturb less moose crucial winter habitat, but more moose crucial year-long habitat than other COUT BAX alternative routes.

Alternative COUT BAX-E affects sensitive habitats used by the same elk, mule deer, pronghorn and moose herds as other COUT BAX alternative routes. For a discussion of potential impacts from Alternative COUT BAX-E to big game habitat in Utah, refer to the impact assessment of Alternative COUT BAX-B. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT BAX-E would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area in Utah.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT BAX-E could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Environmental Setting

The COUT alternative routes are located primarily in the Colorado Plateaus Ecoregion, crossing Moffat County and Rio Blanco County in Colorado, and Uintah, Duchesne and Carbon counties in Utah. The alternative routes then cross into the Wasatch and Uinta Mountains Ecoregion and Wasatch, Utah, Sanpete and Juab counties, and the Central Basin and Range Ecoregion in Juab County. Habitats crossed by the COUT alternative routes are dominated by arid shrub/shrub-steppe, big sagebrush, pinyon-juniper in Ashley National Forest and by aspen, mountain shrub, and montane habitat in Manti-La Sal National Forest. The COUT alternative routes also cross agricultural land, barren lands, and disturbed areas near the communities of Roosevelt, Vernal, Helper, Price, Wellington, and Nephi (Section 3.2.5.4). These habitat types are potentially suitable habitat for a variety of migratory bird species. For a list of BCC and PIF migratory birds and their breeding habitats within Colorado and Utah that are likely to occur throughout the Project area refer to Appendix E, Table E-6.

All COUT alternative routes start near Massadona, Colorado, and follow the Moffat/Rio Blanco county line and U.S. Highway 40 to the Utah/Colorado state line. Alternatives COUT-A and COUT-B diverge from Alternatives COUT-C, COUT-H, and COUT-I south of Dinosaur, Colorado and cross in to Uintah County, Utah. Alternatives COUT-A and COUT-B cross existing oil and gas development and U.S. Highway 40 approximately 15 miles south of Vernal, Utah. The alternative routes cross the Green River and continue west through an agricultural area south of Ballard and Roosevelt. At Ioka, Alternatives COUT-A and COUT-B diverge. Alternative COUT-A continues west, crossing agricultural land and oil and gas development north of Duchesne and Starvation Reservoir and following U.S. Highway 40 to Fruitland. The alternative route crosses into Uinta National Forest just south of Strawberry Reservoir. At the Wasatch/Utah county line just south of Baldy Mountain, Alternative COUT-A crosses a USFS IRA, and follows Spanish Fork Canyon to Thistle. Route Variation COUT-A-1 crosses more of the IRA that Alternative COUT-A. This alternative route turns south along Spencer Canyon, and then west approximately 4 miles north of Fountain Green toward Nephi and Mona. At Ioka, Alternative COUT-B heads southwest across agricultural land to Bridgeland before crossing an area of extensive oil and gas development and Cottonwood Ridge, and into Ashley National Forest. Alternative COUT-B then turns west at the Carbon county line and follows existing transmission lines and U.S. Highway 6 to Thistle, before following the same alignment to Mona as Alternative COUT-A.

Alternative COUT-C follows a similar alignment as Alternative COUT-A in Colorado but turns southwest approximately 5 miles east of the Utah/Colorado state line southeast of Dinosaur. Alternative COUT-C follows an existing high voltage transmission lines southwest towards the Bonanza Power Plant before crossing the White River and the Green River in Utah. The alternative route then follows an existing pipeline along the Bad Land Cliffs, crosses Nine Mile Canyon, and follows the Roan Cliffs. Alternative COUT-C then follows the same geographic path to Mona as Alternative COUT-B. Alternatives COUT-H and COUT-I follow the same alignment as Alternative COUT-C through Colorado to the Roan Cliffs in Utah, approximately 15 miles north of Price. Alternative COUT-H turns southwest along U.S. Highway 191 toward Helper. Alternative COUT-H turns west south of Helper and follows the same alignment to Clover as Alternative COUT BAX-E across the Manti-La Sal National Forest. From the Roan Cliffs, approximately 15 miles north of Price, Alternative COUT-I turns south toward Wellington. Just south of Olsen Reservoir, the alternative route turns west, before turning southwest through existing oil and gas development north of Huntington. The alternative route then follows the same alignment as Alternative COUT BAX-B across the Manti-La Sal National Forest to Mona.

In Colorado, elk nonlimiting range is located south-east and south of Dinosaur on the Moffat/Rio Blanco county line. Severe elk winter range and summer concentration areas are located between Maybell and Dinosaur. In Utah, elk nonlimiting range occurs in the vicinity of Duchesne and Fruitland, Argyle Canyon, Book Cliffs, and on the Uinta and Manti-La Sal National Forests. Elk crucial spring/fall habitat is located on Uinta National Forest east of Heber, between Utah Lake and Strawberry Reservoir and east of Santaquin; and on Manti-La Sal National Forest east of Thistle. Elk crucial winter habitat is located between the Utah/Colorado/Wyoming state line and Vernal along the Utah/Colorado state line west of Duchesne, west of Price, and along the western foothills on the Manti-La Sal and Uinta National Forests. Crucial summer range, which encompasses calving habitat, is located in the Utah/Colorado/Wyoming state line area and higher elevations east of Duchesne. Crucial year-long habitat is primarily concentrated in areas south of Duchesne, east of Price, and between Fruitland and Colton (MV-8b).

In Colorado, mule deer nonlimiting range occurs along the Moffat/Rio Blanco county line. Mule deer critical winter range stretches southwest from Massadona to the Colorado/Utah state line. A large area of critical winter range is located in Rio Blanco County; south of the White River and west of Piceance Creek, and another area of critical winter range is located in the vicinity of Grand Junction. Mule deer migration corridors occur southeast of Rangely. In Utah, mule deer nonlimiting range is located in the vicinity of Ballard and Strawberry Reservoir, East and West Tavaputs Plateaus, Bad Land Cliffs, and the Book Cliffs. Mule deer crucial spring/fall habitat follows the Nine Mile Creek, is located on Manti-La Sal National Forest; and on Uinta National Forest in the Mount Timpanogos area, and east of Santaquin. Crucial summer range, which encompasses fawning habitats, is widely distributed throughout the Project area and occurs primarily between the Utah/Colorado/Wyoming state line and Vernal, north and east of Price and in the vicinity of Thistle. Mule deer crucial winter habitat is located near the Utah/Colorado/Wyoming state line, north and east of Vernal, west of Duchesne, north and west of Price, on the Manti-La Sal and Uinta National Forests. Mule deer crucial winter/spring habitat occurs on the peripheries of Uinta and Manti-La Sal National Forests, and west of Mona. Crucial year-long habitat is primarily concentrated in the area between Vernal and Duchesne in riparian corridors and agricultural development following the Green, Duchesne, and White rivers (MV-9b).

In Colorado, pronghorn nonlimiting range occurs along the Moffat/Rio Blanco county line. Pronghorn severe winter range is located in the vicinity of Massadona, Rangely and along the Colorado/Utah state line near Grand Junction. In Utah, pronghorn nonlimiting range is located south-east of Ballard and south of Duchesne, Pronghorn crucial year-long habitat is located along the Utah/Colorado/Wyoming state line between Bonanza and Duchesne and in the vicinity of Price (MV-9b).

In Utah, moose nonlimiting range is located on the Ashley, Manti-La Sal and Uinta National Forests. Moose crucial spring/fall habitat is located in the vicinity of Strawberry Reservoir. Crucial winter habitat occurs in the vicinity of Fruitland and along the Book Cliffs/Wasatch Plateau area. Crucial year-long habitat occurs between the northeast corner of the state and west of Price. Moose crucial calving grounds are interspersed with crucial winter range between Fruitland and Emery (MV-8b).

Rocky Mountain bighorn sheep nonlimiting range is located on the West Tavaputs Plateau, Argyle Canyon, and on the Uinta National Forest. Crucial year-long habitat for the Rocky Mountain bighorn sheep occurs in the northeast corner of the state and in east central Utah in the Book Cliffs range and East Tavaputs Plateau (MV-9b).

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Mammals

Big Game

Alternative COUT-A and Route Variation COUT-A-1 cross elk, mule deer and pronghorn nonlimiting range on the Moffat/Rio Blanco county line. The alternative route crosses elk and mule deer severe/critical habitat on the Moffat/Rio Blanco county line just north of Rangely. Elk and mule deer severe/critical habitat crossed by the alternative route is in an area affected by existing disturbance, resulting from U.S. Highway 40, Colorado State Highway 64, and power lines. There is no difference in the number of miles of big game nonlimiting range or crucial habitat crossed in Colorado between Alternative COUT-A and Route Variation COUT-A-1 (Tables 3-91 and 3-92). These alternative routes do not cross elk calving grounds, elk and mule deer summer concentration areas, severe/critical year-long habitat, or migration corridors; or pronghorn severe habitat.

TABLE 3-91
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Nonlimiting Range[2] (miles crossed)					
		Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
Alternative COUT-A and Route Variation							
COUT-A	206.0	19.8	41.6	28.1	45.6	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*182.0*	*9.0*	*21.7*	*6.3*	*45.6*	*0.0*	*0.0*
COUT-A-1	205.6	19.8	41.6	28.1	45.6	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*9.0*	*21.7*	*6.3*	*45.6*	*0.0*	*0.0*
Alternative COUT-B and Route Variations							
COUT-B	216.0	25.1	62.8	37.0	60.9	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*192.0*	*14.3*	*42.9*	*15.2*	*60.9*	*0.0*	*0.0*
COUT-B-1	212.7	36.1	62.8	37.0	63.8	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*188.7*	*25.3*	*42.9*	*15.2*	*63.8*	*0.0*	*0.0*
COUT-B-2	214.2	33.7	62.8	37.0	63.1	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*22.9*	*42.9*	*15.2*	*63.1*	*0.0*	*0.0*

TABLE 3-91
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Nonlimiting Range[2] (miles crossed)					
		Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
COUT-B-3	213.9	34.5	62.8	37.0	60.9	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*23.7*	*42.9*	*15.2*	*60.9*	*0.0*	*0.0*
COUT-B-4	214.2	33.3	62.8	37.0	63.1	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*22.5*	*42.9*	*15.2*	*63.1*	*0.0*	*0.0*
COUT-B-5	213.9	34.9	62.8	37.0	60.9	0.0	0.0
Colorado	*24.0*	*10.8*	*19.9*	*21.8*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*24.1*	*42.9*	*15.2*	*60.9*	*0.0*	*0.0*
Alternative COUT-C and Route Variations							
COUT-C	209.8	39.4	41.2	23.3	50.9	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*185.0*	*31.3*	*22.9*	*0.7*	*50.9*	*0.0*	*10.1*
COUT-C-1	206.4	54.1	38.7	23.3	53.8	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*46.0*	*20.4*	*0.7*	*53.8*	*0.0*	*10.1*
COUT-C-2	207.9	51.7	38.7	23.3	53.1	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*43.6*	*20.4*	*0.7*	*53.1*	*0.0*	*10.1*
COUT-C-3 (Agency Preferred Alternative)	207.6	52.9	38.7	23.3	50.9	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*44.8*	*20.4*	*0.7*	*50.9*	*0.0*	*10.1*
COUT-C-4	207.9	47.7	42.0	23.3	53.1	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*39.6*	*23.7*	*0.7*	*53.1*	*0.0*	*10.1*
COUT-C-5	207.6	48.9	42.0	23.3	50.9	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*40.8*	*23.7*	*0.7*	*50.9*	*0.0*	*10.1*
Alternatives COUT-H and COUT-I							
COUT-H (Applicant Preferred Alternative)	200.6	44.7	46.2	23.3	23.1	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*175.8*	*36.6*	*27.9*	*0.7*	*23.1*	*0.0*	*10.1*
COUT-I	240.2	47.5	54.7	32.0	17.6	0.0	10.1
Colorado	*24.8*	*8.1*	*18.3*	*22.6*	*0.0*	*0.0*	*0.0*
Utah	*215.4*	*39.4*	*36.4*	*9.4*	*17.6*	*0.0*	*10.1*

NOTES:
[1]Each of the big game species will not add to the total miles column due to the habitats overlapping.
[2]Includes all designated habitat in Colorado and Utah except habitat in Table 3-92.

TABLE 3-92
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																				
		Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[2]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year-long	Crucial Year-long
Alternative COUT-A and Route Variation																						
COUT-A	206.0	5.0	17.3	7.4	68.2	2.8	0.0	4.3	19.0	67.0	28.8	3.9	0.0	38.9	0.0	38.9	0.0	0.0	14.2	14.7	0.0	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah[1]	*182.0*	*5.0*	*17.3*	*7.4*	*62.6*	*2.8*	*–*	*4.3*	*19.0*	*44.7*	*28.8*	*3.9*	*–*	*38.9*	*0.0*	*38.9*	*–*	*0.0*	*14.2*	*14.7*	*0.0*	*0.0*
COUT-A-1	205.6	5.0	16.9	7.4	68.2	2.8	0.0	4.3	18.6	67.0	28.8	3.9	0.0	38.9	0.0	38.9	0.0	0.0	13.8	14.7	0.0	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*5.0*	*16.9*	*7.4*	*62.6*	*2.8*	*–*	*4.3*	*18.6*	*44.7*	*28.8*	*3.9*	*–*	*38.9*	*0.0*	*38.9*	*–*	*0.0*	*13.8*	*14.7*	*0.0*	*0.0*
Alternative COUT-B and Route Variations																						
COUT-B	216.0	2.2	2.2	14.6	71.7	11.5	0.0	4.3	24.1	60.4	24.1	5.2	0.0	38.9	0.0	38.9	0.0	5.2	0.0	25.8	5.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*192.0*	*2.2*	*2.2*	*14.6*	*66.1*	*11.5*	*–*	*4.3*	*24.1*	*38.1*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*5.2*	*0.0*	*25.8*	*5.2*	*0.0*
COUT-B-1	212.7	2.2	2.2	14.3	64.8	4.4	0.0	4.3	26.6	54.6	24.1	5.2	0.0	38.9	0.0	38.9	0.0	3.2	0.0	21.6	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*188.7*	*2.2*	*2.2*	*14.3*	*59.2*	*4.4*	*–*	*4.3*	*26.6*	*32.3*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*3.2*	*0.0*	*21.6*	*3.2*	*0.0*
COUT-B-2	214.2	2.2	2.2	13.6	69.4	4.4	0.0	4.3	28.1	54.6	24.1	5.2	0.0	38.9	0.0	38.9	0.0	3.2	0.0	23.8	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*2.2*	*2.2*	*13.6*	*63.8*	*4.4*	*–*	*4.3*	*28.1*	*32.3*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*3.2*	*0.0*	*23.8*	*3.2*	*0.0*
COUT-B-3	213.9	2.2	2.2	11.4	70.5	4.4	0.0	4.3	27.8	54.6	24.1	5.2	0.0	38.9	0.0	38.9	0.0	4.8	0.0	24.1	4.8	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*2.2*	*2.2*	*11.4*	*64.9*	*4.4*	*–*	*4.3*	*27.8*	*32.3*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*4.8*	*0.0*	*24.1*	*4.8*	*0.0*

TABLE 3-92
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																				
		Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[2]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year-long	Crucial Year-long
COUT-B-4	214.2	2.2	2.2	13.6	69.8	4.4	0.0	4.3	28.1	54.6	24.1	5.2	0.0	38.9	0.0	38.9	0.0	3.2	0.0	23.8	3.2	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*190.2*	*2.2*	*2.2*	*13.6*	*64.2*	*4.4*	*–*	*4.3*	*28.1*	*32.3*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*3.2*	*0.0*	*23.8*	*3.2*	*0.0*
COUT-B-5	213.9	2.2	2.2	11.4	70.1	4.4	0.0	4.3	27.8	54.6	24.1	5.2	0.0	38.9	0.0	38.9	0.0	4.8	0.0	24.1	4.8	0.0
Colorado	*24.0*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*22.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*189.9*	*2.2*	*2.2*	*11.4*	*64.5*	*4.4*	*–*	*4.3*	*27.8*	*32.3*	*24.1*	*5.2*	*–*	*38.9*	*0.0*	*38.9*	*–*	*4.8*	*0.0*	*24.1*	*4.8*	*0.0*
Alternative COUT-C and Route Variations																						
COUT-C	209.8	7.6	2.2	3.2	66.9	16.9	0.0	5.1	28.1	53.2	24.1	2.7	0.0	57.1	0.0	57.1	0.0	5.2	0.0	39.6	5.2	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah[1]	*185.0*	*7.6*	*2.2*	*3.2*	*61.3*	*16.9*	*–*	*5.1*	*28.1*	*32.5*	*24.1*	*2.7*	*-*	*57.1*	*0.0*	*57.1*	*-*	*5.2*	*0.0*	*39.6*	*5.2*	*9.0*
COUT-C-1	206.4	7.6	2.2	2.9	56.2	9.8	0.0	4.3	32.8	48.4	24.1	2.7	0.0	57.1	0.0	57.1	0.0	3.2	0.0	35.3	3.2	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*181.6*	*7.6*	*2.2*	*2.9*	*50.6*	*9.8*	*–*	*4.3*	*32.8*	*27.7*	*24.1*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*3.2*	*0.0*	*35.3*	*3.2*	*9.0*
COUT-C-2	207.9	7.6	2.2	2.2	60.8	9.8	0.0	4.3	34.3	48.4	24.1	2.7	0.0	57.1	0.0	57.1	0.0	3.2	0.0	37.5	3.2	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*7.6*	*2.2*	*2.2*	*55.2*	*9.8*	*–*	*4.3*	*34.3*	*27.7*	*24.1*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*3.2*	*0.0*	*37.5*	*3.2*	*9.0*

TABLE 3-92
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

		Big Game Crucial Habitat (miles crossed)																				
		Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
Alternative Route	Total Miles[1]	Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[2]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year-long	Crucial Year-long
COUT-C-3 (Agency Preferred Alternative)	207.6	7.6	2.2	0.0	61.5	9.8	0.0	4.3	34.0	48.4	24.1	2.7	0.0	57.1	0.0	57.1	0.0	4.8	0.0	37.8	4.8	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*7.6*	*2.2*	*0.0*	*55.9*	*9.8*	*–*	*4.3*	*34.0*	*27.7*	*24.1*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*4.8*	*0.0*	*37.8*	*4.8*	*9.0*
COUT-C-4	207.9	7.6	2.2	2.2	64.8	9.8	0.0	4.3	32.0	47.4	24.1	2.7	0.0	57.1	0.0	57.1	0.0	3.2	0.0	37.5	3.2	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*183.1*	*7.6*	*2.2*	*2.2*	*59.2*	*9.8*	*–*	*4.3*	*32.0*	*26.7*	*24.1*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*3.2*	*0.0*	*37.5*	*3.2*	*9.0*
COUT-C-5	207.6	7.6	2.2	0.0	65.5	9.8	0.0	4.3	31.7	47.4	24.1	2.7	0.0	57.1	0.0	57.1	0.0	4.8	0.0	37.8	4.8	0.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*182.8*	*7.6*	*2.2*	*0.0*	*59.9*	*9.8*	*–*	*4.3*	*31.7*	*26.7*	*24.1*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*4.8*	*0.0*	*37.8*	*4.8*	*9.0*

TABLE 3-92
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Big Game Crucial Habitat (miles crossed)																				
		Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
		Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year-long	Migration Corridors[2]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year-long	Migration Corridors[2]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year-long	Crucial Year-long
Alternatives COUT-H and COUT-I																						
COUT-H (Applicant Preferred Alternative)	200.6	5.4	0.0	18.9	43.6	5.4	0.0	3.5	31.6	54.5	5.9	2.7	0.0	57.1	0.0	57.1	0.0	1.0	0.0	46.0	1.0	9.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*175.8*	*5.4*	*0.0*	*18.9*	*38.0*	*5.4*	*–*	*3.5*	*31.6*	*33.8*	*5.9*	*2.7*	*–*	*57.1*	*0.0*	*57.1*	*–*	*1.0*	*0.0*	*46.0*	*1.0*	*9.0*
COUT-I	240.2	5.4	0.0	23.2	50.4	9.3	0.0	4.4	33.7	64.3	3.0	2.7	0.0	71.7	0.0	75.1	0.0	0.7	0.0	47.2	0.7	9.0
Colorado	*24.8*	*0.0*	*0.0*	*0.0*	*5.6*	*0.0*	*0.0*	*0.0*	*0.0*	*20.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Utah	*215.4*	*5.4*	*0.0*	*23.2*	*44.8*	*9.3*	*–*	*4.4*	*33.7*	*43.6*	*3.0*	*2.7*	*–*	*71.7*	*0.0*	*75.1*	*–*	*0.7*	*0.0*	*47.2*	*0.7*	*9.0*

NOTES: [1]Each of the big game species will not add to the total miles column due to the habitats overlapping.
[2]Mapped data for elk, mule deer, and pronghorn migration corridors were unavailable for the state of Utah.

Environmental Consequences

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk and mule deer populations by Alternative COUT-A and Route Variation COUT-A-1 in Colorado would be low (Table 3-93). Initial impacts on wildlife resources are determined through the implementation of seasonal wildlife restrictions on construction and maintenance activities within the Project area. The BLM and other agencies may grant exceptions to seasonal wildlife restrictions. However, any exceptions would increase the initial level of impacts on wildlife resources and potentially result in greater residual impacts.

Impacts on big game by Alternative COUT-A and Route Variation COUT-A-1 in Colorado would be low (Table 3-93). Impacts on big game in Colorado would be similar for all COUT alternative routes as they follow similar alignments through the state.

TABLE 3-93
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Big Game[1] Crucial Habitat (miles crossed)			
		Nonidentifiable	Low	Moderate	High
Alternative COUT-A and Route Variation					
COUT-A	206.0	41.9	164.1	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*182.0*	*41.6*	*140.4*	*0.0*	*0.0*
COUT-A-1	205.6	41.9	163.7	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*181.6*	*41.6*	*140.0*	*0.0*	*0.0*
Alternative COUT-B and Route Variations					
COUT-B	216.0	44.7	171.3	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*192.0*	*44.4*	*147.6*	*0.0*	*0.0*
COUT-B-1	212.7	44.7	168.0	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*188.7*	*44.4*	*144.3*	*0.0*	*0.0*
COUT-B-2	214.2	44.7	169.5	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*190.2*	*44.4*	*145.8*	*0.0*	*0.0*
COUT-B-3	213.9	44.7	169.2	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*189.9*	*44.4*	*145.5*	*0.0*	*0.0*
COUT-B-4	214.2	44.7	169.5	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*190.2*	*44.4*	*145.8*	*0.0*	*0.0*
COUT-B-5	213.9	44.7	169.2	0.0	0.0
Colorado	*24.0*	*0.3*	*23.7*	*0.0*	*0.0*
Utah	*189.9*	*44.4*	*145.5*	*0.0*	*0.0*

TABLE 3-93
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Big Game[1] Crucial Habitat (miles crossed)			
		Nonidentifiable	Low	Moderate	High
Alternative COUT-C and Route Variations					
COUT-C	209.8	27.5	182.3	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*185.0*	*24.8*	*160.2*	*0.0*	*0.0*
COUT-C-1	206.4	27.5	178.9	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*181.6*	*24.8*	*156.8*	*0.0*	*0.0*
COUT-C-2	207.9	27.5	180.4	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*183.1*	*24.8*	*158.3*	*0.0*	*0.0*
COUT-C-3 (Agency Preferred Alternative)	207.6	27.5	180.1	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*182.8*	*24.8*	*158.0*	*0.0*	*0.0*
COUT-C-4	207.9	27.5	180.4	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*183.1*	*24.8*	*158.3*	*0.0*	*0.0*
COUT-C-5	207.6	27.5	180.1	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*182.8*	*24.8*	*158.0*	*0.0*	*0.0*
Alternatives COUT-H and COUT-I					
COUT-H (Applicant Preferred Alternative)	200.6	28.4	172.2	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*175.8*	*25.7*	*150.1*	*0.0*	*0.0*
COUT-I	240.2	39.1	201.1	0.0	0.0
Colorado	*24.8*	*2.7*	*22.1*	*0.0*	*0.0*
Utah	*215.4*	*36.4*	*179.0*	*0.0*	*0.0*

NOTES: [1]Includes impacts on elk, mule deer, pronghorn, moose, and Rocky Mountain bighorn sheep seasonal habitats.

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance would be greater to elk and mule deer nonlimiting range, but less to pronghorn nonlimiting range compared to all other COUT alternative routes in Colorado (Table 3-94). The estimated area of disturbance to big game severe and critical habitat in Colorado would be similar for all COUT alternative routes, which follow similar alignments through the state (Table 3-95). The estimated area of disturbance is discussed under Affected Environment for Alternative COUT-A. Disturbance to big game severe and critical habitat under Alternative COUT-A and Route Variation COUT-A-1 in Colorado is primarily to elk severe winter range and mule deer critical winter range.

TABLE 3-94
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Nonlimiting Range[1] (acres)					
	Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
Alternative COUT-A and Route Variation						
COUT-A	366	769	520	843	0	0
Colorado	*200*	*368*	*403*	*0.0*	*0*	*0*
Utah	*166*	*401*	*117*	*843*	*0*	*0*
COUT-A-1	366	769	520	843	0	0
Colorado	*200*	*368*	*403*	*0*	*0*	*0*
Utah	*166*	*401*	*117*	*843*	*0*	*0*
Alternative COUT-B and Route Variations						
COUT-B	459	1,149	677	1,114	0	0
Colorado	*198*	*364*	*399*	*0*	*0*	*0*
Utah	*261*	*785*	*278*	*1,114*	*0*	*0*
COUT-B-1	665	1,156	681	1,175	0	0
Colorado	*199*	*366*	*401*	*0*	*0*	*0*
Utah	*466*	*790*	*280*	*1,175*	*0*	*0*
COUT-B-2	620	1,155	680	1,160	0	0
Colorado	*199*	*366*	*401*	*0*	*0*	*0*
Utah	*421*	*789*	*279*	*1,160*	*0*	*0*
COUT-B-3	634	1,154	680	1,119	0	0
Colorado	*198*	*366*	*401*	*0*	*0*	*0*
Utah	*436*	*788*	*279*	*1,119*	*0*	*0*
COUT-B-4	612	1,154	680	1,159	0	0
Colorado	*199*	*366*	*401*	*0*	*0*	*0*
Utah	*413*	*788*	*279*	*1,159*	*0*	*0*
COUT-B-5	656	1,181	696	1,146	0	0
Colorado	*203*	*374*	*410*	*0*	*0*	*0*
Utah	*453*	*807*	*286*	*1,146*	*0*	*0*
Alternative COUT-C and Route Variations						
COUT-C	755	790	447	976	0	194
Colorado	*155*	*351*	*434*	*0*	*0*	*0*
Utah	*600*	*439*	*13*	*976*	*0*	*194*
COUT-C-1	1,046	748	450	1,040	0	195
Colorado	*157*	*354*	*437*	*0.0*	*0*	*0*
Utah	*889*	*394*	*13*	*1040*	*0*	*195*
COUT-C-2	997	746	449	1,024	0	195
Colorado	*156*	*353*	*436*	*0*	*0*	*0*
Utah	*841*	*393*	*13*	*1,024*	*0*	*195*
COUT-C-3 (Agency Preferred Alternative)	1,029	753	453	990	0	196
Colorado	*157*	*356*	*440*	*0*	*0*	*0*
Utah	*872*	*397*	*13*	*990*	***0***	*196*
COUT-C-4	928	817	453	1,033	0	196
Colorado	*158*	*356*	*439*	*0*	*0*	*0*
Utah	*770*	*461*	*14*	*1,033*	***0***	*196*

TABLE 3-94
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME NONLIMITING RANGE ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Nonlimiting Range[1] (acres)					
	Elk	Mule Deer	Pronghorn	Moose	Desert Bighorn Sheep	Rocky Mountain Bighorn Sheep
COUT-C-	921	791	439	958	0	190
Colorado	*153*	*345*	*426*	*0*	*0*	*0*
Utah	*768*	*446*	*13*	*958*	*0*	*190*
Alternatives COUT-H and COUT-I						
COUT-H (Applicant Preferred Alternative)	824	851	429	426	0	186
Colorado	*149*	*337*	*416*	*0*	*0*	*0*
Utah	*675*	*514*	*13*	*426*	*0*	*186*
COUT-I	862	993	581	319	0	183
Colorado	*147*	*332*	*410*	*0*	*0*	*0*
Utah	*715*	*661*	*171*	*319*	*0*	*183*

NOTE: [1]Includes all designated habitat in Colorado and Utah except habitat in Table 3-95.

Alternative COUT-A and Route Variation COUT-A-1 cross the western edge of elk severe winter range, which leaves an extensive area of severe winter range unaffected by the alternative routes in Colorado. The elk severe winter range crossed by the alternative routes is subject to existing disturbance, which suggests local populations are tolerant of or have adapted to previous habitat alteration. Thus any disturbance or displacement of individuals from the alternative routes during construction is likely to be temporary. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during sensitive periods, impacts from Alternative COUT-A and Route Variation COUT-A-1 would be limited to minor loss of forage in seasonal habitat areas, a reduction in the potential spread of weeds, and a reduction in human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence elk populations in the Project area.

The mule deer critical winter range crossed by Alternative COUT-A and Route Variation COUT-A-1 is located at the northern edge of available mule deer habitat in Rio Blanco County. The areas of potentially affected mule deer critical winter range are connected by migration corridors to adjacent habitat southeast of the alternative routes. Local populations have potentially adapted to existing disturbance in their range, or have circumvented existing disturbance by using adjacent, well connected habitat areas. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that mule deer use specific seasonal habitats, impacts from Alternative COUT-A and Route Variation COUT-A-1 would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the presence of weeds in big game habitats, and human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence mule deer populations in the Project area.

TABLE 3-95
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																				
	Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year Long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year Long	Crucial Year Long
Alternative COUT-A and Route Variation																					
COUT-A	92	320	137	1,262	52	0	79	351	1,239	533	72	0	719	0	719	0	0	263	272	0	0
Colorado	*0*	*0*	*0*	*104*	*0*	*0*	*0*	*0*	*412*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*92*	*320*	*137*	*1,158*	*52*	*–*	*79*	*351*	*827*	*533*	*72*	*–*	*719*	*0*	*719*	*–*	*0*	*263*	*272*	*0*	*0*
COUT-A-1	92	312	137	1,261	51	0	79	344	1,239	533	72	0	719	0	719	0	0	255	272	0	0
Colorado	*0*	*0*	*0*	*103*	*0*	*0*	*0*	*0*	*412*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah[1]	*92*	*312*	*137*	*1,158*	*51*	*–*	*79*	*344*	*827*	*533*	*72*	*–*	*719*	*0*	*719*	*–*	*0*	*255*	*272*	*0*	*0*
Alternative COUT-B and Route Variations																					
COUT-B	40	40	267	1,311	210	0	79	441	1,105	441	95	0	712	0	712	0	95	0	472	95	0
Colorado	*0*	*0*	*0*	*102*	*0*	*0*	*0*	*0*	*408*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*40*	*40*	*267*	*1,209*	*210*	*–*	*79*	*441*	*697*	*441*	*95*	*–*	*712*	*0*	*712*	*–*	*95*	*0*	*472*	*95*	*0*
COUT-B-1	40	40	263	1,193	81	0	79	490	1,006	444	96	0	716	0	716	0	59	0	398	59	0
Colorado	*0*	*0*	*0*	*103*	*0*	*0*	*0*	*0*	*411*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*40*	*40*	*263*	*1,090*	*81*	*–*	*79*	*490*	*595*	*444*	*96*	*–*	*716*	*0*	*716*	*–*	*5*	*0*	*398*	*59*	*0*
COUT-B-2	40	40	250	1,276	81	0	79	517	1,004	443	96	0	715	0	715	0	59	0	438	59	0
Colorado	*0*	*0*	*0*	*103*	*0*	*0*	*0*	*0*	*410*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*40*	*40*	*250*	*1,173*	*81*	*–*	*79*	*517*	*594*	*443*	*96*	*–*	*715*	*0*	*715*	*–*	*59*	*0*	*438*	*59*	*0*

TABLE 3-95
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																				
	Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year Long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year Long	Crucial Year Long
COUT-B-3	40	40	209	1,297	81	0	79	511	1,004	443	96	0	715	0	715	0	88	0	443	88	0
Colorado	*0*	*0*	*0*	*104*	*0*	*0*	*0*	*0*	*410*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*40*	*40*	*209*	*1,193*	*81*	*–*	*79*	*511*	*594*	*443*	*96*	*–*	*715*	*0*	*715*	*–*	*88*	*0*	*443*	*88*	*0*
COUT-B-4	40	40	250	1,282	81	0	79	516	1,003	443	95	0	715	0	715	0	59	0	437	59	0
Colorado	*0*	*0*	*0*	*103*	*0*	*0*	*0*	*0*	*410*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*40*	*40*	*250*	*1,179*	*81*	*–*	*79*	*516*	*593*	*443*	*95*	*–*	*715*	*0*	*715*	*–*	*59*	*0*	*437*	*59*	*0*
COUT-B-5	41	41	214	1,319	83	0	81	523	1,027	453	98	0	732	0	732	0	90	0	453	90	0
Colorado	*0*	*0*	*0*	*105*	*0*	*0*	*0*	*0*	*419*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*41*	*41*	*214*	*1,214*	*83*	*–*	*81*	*523*	*608*	*453*	*98*	*–*	*732*	*0*	*732*	*–*	*90*	*0*	*453*	*90*	*0*
Alternative COUT-C and Route Variations																					
COUT-C	146	42	61	1,282	324	0	98	539	1,020	462	52	0	1,094	0	1,094	0	100	0	759	100	173
Colorado	*0*	*0*	*0*	*107*	*0*	*0*	*0*	*0*	*397*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*146*	*42*	*61*	*1,175*	*324*	*–*	*98*	*539*	*623*	*462*	*52*	*–*	*1,094*	*0*	*1,094*	*–*	*100*	*0*	*759*	*100*	*173*
COUT-C-1	147	42	56	1,086	189	0	83	634	935	466	52	0	1,104	0	1,104	0	62	0	682	62	174
Colorado	*0*	*0*	*0*	*108*	*0*	*0*	*0*	*0*	*400*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*147*	*42*	*56*	*978*	*189*	*–*	*83*	*634*	*535*	*466*	*52*	*–*	*1,104*	*0*	*1,104*	*–*	*62*	*0*	*682*	*62*	*174*

TABLE 3-95
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																				
	Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year Long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year Long	Crucial Year Long
COUT-C-2	146	42	42	1,172	189	0	83	661	933	465	52	0	1,101	0	1,101	0	62	0	723	62	174
Colorado	*0*	*0*	*0*	*108*	*0*	*0*	*0*	*0*	*399*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*146*	*42*	*42*	*1,064*	*189*	*–*	*83*	*661*	*534*	*465*	*52*	*–*	*1,101*	*0*	*1,101*	*–*	*62*	*0*	*723*	*62*	*174*
COUT-C-3 (Agency Preferred Alternative)	148	43	0	1,197	191	0	84	662	942	469	52	0	1,111	0	1,111	0	93	0	735	93	175
Colorado	*0*	*0*	*0*	*109*	*0*	*0*	*0*	*0*	*403*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*148*	*43*	*0*	*1,088*	*191*	*–*	*84*	*662*	*539*	*469*	*52*	*–*	*1,111*	*0*	*1,111*	*–*	*93*	*0*	*735*	*93*	*175*
COUT-C-4	148	43	43	1,260	191	0	84	622	922	469	52	0	1,110	0	1,110	0	62	0	729	62	175
Colorado	*0*	*0*	*0*	*109*	*0*	*0*	*0*	*0*	*403*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah[1]	*148*	*43*	*43*	*1,151*	*191*	*–*	*84*	*622*	*519*	*469*	*52*	*–*	*1,110*	*0*	*1,110*	*–*	*62*	*0*	*729*	*62*	*175*
COUT-C-5	143	41	0	1,233	184	0	81	597	892	454	51	0	1,075	0	1,075	0	90	0	712	90	169
Colorado	*0*	*0*	*0*	*105*	*0*	*0*	*0*	*0*	*390*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah[1]	*143*	*41*	*0*	*1,128*	*184*	*–*	*81*	*597*	*502*	*454*	*51*	*–*	*1,075*	*0*	*1,075*	*–*	*90*	*0*	*712*	*90*	*169*

TABLE 3-95
ALTERNATIVE ROUTE COMPARISON FOR BIG GAME CRUCIAL HABITAT ACRES OF DISTURBANCE FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Big Game Crucial Habitat (acres)																				
	Elk						Mule Deer						Pronghorn				Moose				Rocky Mountain Bighorn Sheep
	Calving Grounds	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Crucial Spring/Fall Range	Crucial Summer/Summer Concentration	Crucial/Critical Winter Range	Crucial Winter/Spring Range	Crucial Year Long	Migration Corridors[1]	Fawning Areas	Crucial/Severe Winter Range	Crucial Year Long	Migration Corridors[1]	Calving Grounds	Crucial Spring/Fall Range	Crucial Winter Range	Crucial Year Long	Crucial Year Long
Alternatives COUT-H and COUT-I																					
COUT-H (Applicant Preferred Alternative)	99	0	348	803	99	0	64	582	1,004	109	50	0	1,052	0	1,052	0	18	0	848	18	166
Colorado	*0*	*0*	*0*	*103*	*0*	*0*	*0*	*0*	*381*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*99*	*0*	*348*	*700*	*99*	*–*	*64*	*582*	*623*	*109*	*50*	*–*	*1,052*	*0*	*1,052*	*–*	*18*	*0*	*848*	*18*	*166*
COUT-I	98	0	421	915	169	0	80	611	1,167	54	49	0	1,301	0	1,363	0	13	0	856	13	163
Colorado	*0*	*0*	*0*	*102*	*0*	*0*	*0*	*0*	*376*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*98*	*0*	*421*	*813*	*169*	*–*	*80*	*611*	*791*	*54*	*49*	*–*	*1,301*	*0*	*1,363*	*–*	*13*	*0*	*856*	*13*	*163*

NOTE: [1]Mapped data for elk, mule deer, and pronghorn migration corridors were unavailable for the state of Utah.

Affected Environment (Utah)

Mammals

Big Game

Alternative COUT-A and Route Variation COUT-A-1 in Utah cross elk nonlimiting range north of Arcadia and Starvation Reservoir, and near Fruitland (Table 3-91). The alternative routes cross elk calving grounds, crucial spring/fall, crucial winter range, summer concentration areas, and crucial year-long habitat between the Duchesne River and Strawberry Reservoir, as well as another area of elk crucial winter range on the Uinta National Forest (Table 3-92). These alternative routes cross mule deer crucial spring/fall in the vicinity of Mount Baldy, and winter/spring habitat on Uinta National Forest and along the U.S. Highway 89 corridor. Crucial year-long habitat along the Green and Uinta rivers just east of Roosevelt, as well as summer concentration areas, crucial winter range, and crucial year-long habitat between the Duchesne River and Strawberry Reservoir. Mule deer crucial winter range is crossed on Manti-La Sal and Uinta National Forests. Alternative COUT-A and Route Variation COUT-A-1 in Utah crosses pronghorn crucial year-long habitat and fawning areas between the Colorado/Utah state line and Duchesne, but do not cross pronghorn crucial winter range. Alternative COUT-A and Route Variation COUT-A-1 cross moose crucial spring/fall and winter range in the vicinity of Strawberry Reservoir.

Environmental Consequences (Utah)

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer, pronghorn and moose populations by Alternative COUT-A in Utah would be low (Table 3-93). Impacts on big game by Alternative COUT-A and Route Variation COUT-A-1 in Utah would be primarily low, with some areas in which impacts are nonidentifiable (Table 3-93).

Results of Additional Analysis of Potential Impacts

The estimated area of disturbance to elk and mule deer game nonlimiting range would be greater from Alternative COUT-A in Utah compared to other COUT alternative routes (Table 3-94).

Similar estimated area of disturbance to pronghorn nonlimiting range would occur between all COUT alternative routes. The estimated area of disturbance to elk crucial habitat in Utah differs between the COUT alternative routes (Table 3-95). Alternative COUT-A and Route Variation COUT-A-1 would result in the least impact to elk crucial year-long habitat than other COUT alternative routes, but the greatest impact on elk calving grounds and crucial spring/summer range compared to other COUT alternative routes. Alternative COUT-B and COUT-C would have the greatest impact to elk crucial winter range. Alternative COUT-C also has the greatest impact on elk calving areas and crucial yearling habitat compared to other COUT alternative routes. Overall, disturbance to elk crucial habitat is comparable between Alternatives COUT-A, COUT-B, and COUT-C. Alternative COUT-I affects elk summer concentration areas more than the other COUT alternative routes, but is also the longest alternative route in Utah. Alternative COUT-H would create the least disturbance to elk sensitive habitats.

Alternative COUT-A would result in the greatest impact on mule deer crucial winter range and winter/spring ranges, but would have the least impact to mule deer crucial summer range compared to other COUT alternative routes. Overall COUT-A would have the greatest impact on mule deer crucial

habitat in Utah and Alternative COUT-H would have the least disturbance. Alternative COUT-A and Route Variation COUT-A-1 would have the least disturbance to pronghorn crucial habitat in Utah, while Alternative COUT-I would have the greatest impact; specifically to pronghorn crucial year-long habitat and fawning areas.

Alternative COUT-A and Route Variation COUT-A-1 would have the least estimated area of disturbance to moose crucial winter range in Utah, but are the only COUT alternative routes to impact moose crucial spring/fall habitat. Alternative COUT-C would have the greatest estimated area of disturbance to moose calving grounds and crucial year-long habitat. Alternative COUT-I would have the greatest disturbance to moose crucial winter range, followed by Alternatives COUT-H and COUT-C.

The COUT alternative routes cross crucial habitat used by the Wasatch Mountains elk herd with an estimated population of 6,478 elk. Limiting factors to local elk herds include range conditions, energy development and urban expansion, alteration and fragmentation of vegetation composition, drought conditions, and forage competition (UDWR 2012a). Similarly the Wasatch Mountains mule deer herd with a current population size of 40,800 is affected by the alternative routes. Limiting factors for the Wasatch Mountains mule deer herd include the poor condition of winter range due to drought conditions (UDWR 2006c).

The elk, mule deer, and moose crucial winter range and summer concentration areas crossed by Alternative COUT-A and Route Variation COUT-A-1 are part of extensive crucial habitat available in Utah, located north of the Project area in Wasatch-Cache and Ashley National Forests, and south in Uinta and Manti-La Sal National Forests. Big game crucial habitat that may be affected by the COUT alternative routes are subject to existing disturbance from U.S. Highways 40, 6, and 89; Utah State Route 132, and I-15, oil and gas development, and transmission lines. Mule deer crucial year-long habitat is located in riparian corridors and would be affected by any of the COUT alternative routes, although mule deer crucial habitat is located in an area that has previously been affected by human and agricultural development. Most pronghorn crucial year-long/fawning habitat in Utah is located west of I-15. Alternative habitat that is undisturbed by the Project is also located north and south of the Project area.

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT-A would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area.

Alternative COUT-A Route Variation (COUT-A-1)

Slight variations occur in the estimated area of disturbance (in acres) to big game nonlimiting range and crucial habitat from Alternative COUT-A and Route Variation COUT-A-1 in Utah (Tables 3-94 and 3-95). Alternative COUT-A would have a greater impact on elk and moose crucial spring/fall habitat and mule deer crucial summer habitat in Utah than Route Variation COUT-A-1.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT-A and Route Variation COUT-A-1 could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

The affected environment for Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado would be the same as Alternative COUT-A and Route Variation COUT-A-1, as the two alternative routes follow the same alignment through the state (Tables 3-91 and 3-92).

Environmental Consequences (Colorado)

Alternative COUT-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado would be the same as Alternative COUT-A and COUT-A-1 (Table 3-93) in Colorado as the alternative routes follow the same alignment through the state.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Alternative COUT-B and Route Variations COUT-B -1, COUT-B -2, COUT-B-3, COUT-B-4, and COUT-B-5 would follow the same alignment through Colorado. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative COUT-B and Route Variations COUT-B -1, COUT-B -2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado occur due to analysis methodology (Tables 3-94 and 3-95), as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Utah)

Mammals

Big Game

Alternative COUT-B and route variations in Utah cross elk nonlimiting range south of Duchesne and in the Roan Cliffs area (Table 3-91). Mule deer nonlimiting range is crossed south of Duchesne, in the vicinity of Roosevelt, and in the Bad Land Cliffs. Pronghorn nonlimiting range is crossed east of Ballard and south of Duchesne. Moose nonlimiting range is crossed on Ashley, Manti-La Sal and Uinta National Forests. Alternative COUT-B and route variations in Utah cross elk crucial winter range and summer concentration areas on Ashley National Forest, crucial year-long habitat along the U.S. Highway 6 corridor, and calving grounds (Table 3-92). This alternative route crosses mule deer crucial spring/fall, winter, winter/spring range, and summer concentration areas on Ashley and Manti-La Sal National Forests, and crucial year-long habitat east of Duchesne along the Duchesne River in riparian habitat and agricultural areas. Alternative COUT-B in Utah crosses the same route through pronghorn crucial year-long habitat and fawning areas as Alternative COUT-A in Utah. The alternative route crosses moose calving areas, crucial winter range, and crucial year-long habitat on the Ashley and Uinta National Forests. Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 diverge in the Roan Cliffs area in Utah County. Route Variation COUT-B-1 crosses more elk and moose nonlimiting range than all the other COUT-B route variations. However, Alternative COUT-B crosses more elk crucial summer and winter range, mule deer crucial winter range, and moose calving areas and crucial winter range than all other COUT-B route variations in Utah.

Environmental Consequences (Utah)

Alternative COUT-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT-B in Utah would be low (Table 3-93). Impacts on big game sensitive habitat crossed by Alternative COUT-B in Utah would be primarily low, with some areas of nonidentifiable impacts. Impacts from Alternative COUT-B would be less than Alternatives COUT-I, COUT-C, and COUT-H, but would be greater for Alternative COUT-B than Alternative COUT-A.

Results of Additional Analysis of Potential Impacts

Alternative COUT-B would have greater disturbance on big game nonlimiting range than other COUT alternative routes in Utah, especially to mule deer and moose nonlimiting range (Table 3-94). In contrast, Alternative COUT-B would generally have less impact on big game crucial habitat than other COUT alternative routes in Utah, except COUT-A (Table 3-95). However, Alternative COUT-B would have the greatest impact on elk crucial winter range compared to other COUT alternative routes. The elk crucial year-long habitat crossed by Alternative COUT-B is located in an area of existing disturbance close to U.S. Highway 6, but represents the northern edge of a series of contiguous crucial year-long habitats that connect the Wasatch Plateau to the Book Cliffs Range. Local elk populations appear to be tolerant of or have adapted to existing development in their range, therefore further disturbance or displacement of individuals during Project construction is likely to be temporary.

Alternative COUT-B would disturb a larger portion of mule deer crucial year-long habitat than Alternative COUT-A and Route Variation COUT-A-1 located along riparian corridors and in agricultural development following the Green and Duchesne rivers. Disturbance to pronghorn crucial year-long habitat from Alternative COUT-B would be similar to that from Alternative COUT-A as the alternative routes cross the same pronghorn crucial habitat before the alternative routes diverge in Utah. For additional discussion on big game herds likely to be affected in Utah refer to Alternative COUT-A. After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific crucial habitats, impacts from Alternative COUT-B would be limited to minor loss of forage in crucial habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Variations occur in the estimated area of disturbance (in acres) to big game nonlimiting range and crucial habitat from Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah (Tables 3-94 and 3-95). Route Variation COUT-B-1 would have the greatest impact on elk and moose nonlimiting range; however, Route Variation COUT-B-5 would have the greatest impact on mule deer and pronghorn nonlimiting range. Alternative COUT-B would have the greatest overall impact on big game crucial habitat in Utah. Specifically, Alternative COUT-B would have the greatest impact elk crucial summer and winter range, mule deer and moose crucial winter range, and moose crucial year-long habitat compared to all other COUT-B route variations.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-B and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT-B and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado cross similar miles of nonlimiting range in Colorado to Alternative COUT-A and Route Variation COUT-A-1 in Colorado (Tables 3-91 and 3-92). Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado cross similar miles of big game severe and critical habitat to Alternative COUT-A and Route Variation COUT-A-1 in Colorado, except that Alternative COUT-C crosses less mule deer critical winter range then Alternative COUT-A (Table 3-92).

Environmental Consequences (Colorado)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT-C in Colorado would be low (Table 3-93). Impacts on big game sensitive habitat crossed by Alternative COUT-C in Colorado would be primarily low, with some areas of nonidentifiable impacts. Impacts from Alternative COUT-C would be the same as Alternatives COUT-H and COUT-I in Colorado, but impacts on big game from Alternative COUT-C would be less than for Alternatives COUT-A and COUT-B in Colorado.

Results of Additional Analysis of Potential Impacts

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT-C would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area. For additional analysis of impacts on big game populations in Colorado resulting from Alternative COUT-C, refer to Alternative COUT-A.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 would follow the same alignment through Colorado. Slight variations in the estimated area of disturbance (in acres) to nonlimiting range and crucial habitat from Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado occur due to

analysis methodology (Tables 3-94 and 3-95), as alternative routes that cross the same length of wildlife habitat vary in overall length across the Project area.

Affected Environment (Utah)

Mammals

Big Game

Alternative COUT-C and route variations cross elk and mule deer nonlimiting range in Duchesne County on the West Tavaputs Plateau and Argyle Canyon area, and elk nonlimiting range in Utah County south of the Ashley National Forest. The alternative routes also cross pronghorn nonlimiting range on the West Tavaputs Plateau, and Rocky Mountain bighorn sheep nonlimiting range in the Argyle Canyon area. Alternative COUT-C and associated route variations in Utah cross elk crucial year-long habitat and calving areas just west of the Green River, and crosses elk crucial winter range in the vicinity of Nine Mile Canyon in Duchesne County. These alternative routes cross mule deer crucial year-long habitat along riparian corridors located along the White and Green rivers, mule deer crucial winter range located along Argyle Creek; and summer concentration areas and winter/spring habitat in the Nine Mile Canyon area. Alternative COUT-C route variations cross a large area of pronghorn crucial year-long habitat between the Colorado/Utah state line to west of the Green River from the Roan Cliffs in Duchesne County. The alternative routes cross Rocky Mountain bighorn sheep crucial year-long habitat between the Green and White rivers. Alternative COUT-C and route variations follow the same alignment through Ashley, Uinta and Manti-La Sal National Forests as Alternative COUT-B, and therefore cross the same elk, mule deer and moose crucial habitats. Variations occur in the number of miles of big game nonlimiting range and crucial habitat crossed in Utah from Alternative COUT-C and route variations (Tables 3-91 and 3-92). Alternative COUT-C crosses more elk crucial winter and year-long habitat, mule deer crucial spring/fall and winter habitat, and moose calving grounds and crucial year-long habitat than all other COUT-C route variations.

Environmental Consequences (Utah)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT-C in Utah would be low (Table 3-93).

Impacts on big game crucial habitat crossed by Alternative COUT-C in Utah would be primarily low, with some areas of nonidentifiable impacts (Table 3-93). Impacts from Alternative COUT-C would be less than COUT-I, but greater than COUT-H, COUT-B, and COUT-A respectively.

Results of Additional Analysis of Potential Impacts

Alternative COUT-C would have the greatest impact on pronghorn and Rocky Mountain bighorn sheep nonlimiting range (Table 3-94). Alternative COUT-B would have the greatest overall impact on big game nonlimiting range, and Alternative COUT-A would have the least. Alternative COUT-C would have similar effects on elk, mule deer and moose crucial habitat as Alternative COUT-A, as the alternative route either follows the same route through big game crucial habitat, or habitats crossed are contiguous or connected to those crossed by COUT-A (Table 3-95). For additional discussion on big game herds likely to be affected in Utah, refer to the discussion for Alternative COUT-A. The large area of pronghorn

crucial year-long habitat crossed by Alternative COUT-C is located in substantial oil and gas development, which suggests that local pronghorn populations are tolerant of, or have adapted to existing development in their range. Furthermore alternative crucial year-long habitat that is undisturbed by the Project area is available to the south in Grand County and to the north in Daggett County. Alternative COUT-C crosses the edge of Rocky Mountain bighorn sheep crucial year-long southern range in Utah, leaving the majority of crucial year-long habitat on the East Tavaputs Plateau undisturbed by the Project. All Rocky Mountain bighorn sheep in Utah, currently estimated at approximately 1,900 animals, are the result of transplant efforts (UDWR 2008a). Limiting factors to bighorn sheep include parasite and disease transference and forage competition from domestic sheep and other ungulates, predation, habitat degradation and fragmentation from mineral development, and human disturbance from increased recreational activities. However, transplanting animals remains the main management tool for restoring and maintaining healthy bighorn populations in Utah (UDWR 2008a). After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT-C would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Variations occur in the estimated area of disturbance (in acres) to big game nonlimiting range and crucial habitat in Utah from Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 (Tables 3-94 and 3-95). Alternative COUT-C would have the least impact on big game nonlimiting range and Route Variation COUT-C-1 would have the greatest impact on nonlimiting range. However, Alternative COUT-C would have the greatest impact on big game crucial habitat. Specifically, Alternative COUT-C would have the greatest impact on elk crucial summer, winter, and year-long habitat, mule deer crucial spring/fall and winter habitat, and moose calving grounds, crucial winter range and year-long habitat than all other COUT-C route variations. Overall, Route Variation COUT-C-1 would have as the least impact on crucial habitat of all the COUT-C route variations in Utah.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-C and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT-C and associated route variations could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment (Colorado)

The affected environment for Alternative COUT-H in Colorado would be similar to Alternative COUT-A in Colorado, and the same as Alternative COUT-C in Colorado as the alternative routes follow the same alignment through the state (Tables 3-94 and 3-95).

Environmental Consequences (Colorado)

Alternative COUT-H

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT-H in Colorado would be similar to Alternative COUT-A (Tables 3-91 and 3-92) as the alternative routes follow similar alignments through the state.

Affected Environment (Utah)

Mammals

Big Game

The affected environment for Alternative COUT-H in Utah would be the same as Alternative COUT-C between the Colorado/Utah state line and the Roan Cliffs in Duchesne County for elk, mule deer, and pronghorn, the two alternative routes follow the same alignment through the state (Tables 3-91 and 3-92). Alternative COUT-H in Utah crosses elk nonlimiting range and crucial summer concentration areas northeast of Helper, and crucial spring/fall and summer concentration areas on Manti-La Sal National Forest. The alternative route crosses mule deer nonlimiting range northeast of Helper; and crosses elk crucial winter range and mule deer crucial winter range west of Price, in the Cedar Hills west of Fairview and crucial winter and winter/spring range on Uinta National Forest. Alternative COUT-H crosses elk severe winter range and mule deer summer concentration areas, and moose crucial winter range on Manti-La Sal National Forest.

Environmental Consequences (Utah)

Alternative COUT-H

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer and pronghorn populations by Alternative COUT-H in Utah would be low (Table 3-93).

Impacts on big game crucial habitat crossed by Alternative COUT-H in Utah would be primarily low, with some areas of nonidentifiable impacts. Impacts would be greater from Alternatives COUT-I and COUT-C than impacts from Alternative COUT-H. The impacts for Alternative COUT-H would be greater than those for Alternatives COUT-A or COUT-B.

Results of Additional Analysis of Potential Impacts

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times that big game use specific seasonal habitats, impacts from Alternative COUT-H would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area. For additional discussion on big game herds likely to be affected in Utah, refer to the discussion for Alternative COUT-A.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT-H could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs.

Alternative COUT-I

Affected Environment (Colorado)

The affected environment for Alternative COUT-I in Colorado would be similar to Alternative COUT-A, and the same as Alternative COUT-C as the alternative routes follow the same alignment through the state (Tables 3-91 and 3-92).

Environmental Consequences (Colorado)

Alternative COUT-I

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The environmental consequences for Alternative COUT-I in Colorado would be similar to Alternative COUT-A (Tables 3-94 and 3-95), and the same as Alternative COUT-C as the alternative routes follow the same alignment through the state.

Affected Environment (Utah)

Mammals

Big Game

The affected environment for Alternative COUT-I in Utah would be the same as Alternative COUT-C between the Colorado/Utah state line and the Roan Cliffs in Duchesne County as the alternative routes follow the same alignment through the state (Tables 3-91 and 3-92). This alternative route crosses elk and mule deer nonlimiting range east of Helper along the Book Cliffs range, and in the vicinity of Huntington. Alternative COUT-I also crosses mule deer nonlimiting range east of Price and Wellington, and in Castle Valley on the Carbon/Emery county line. The alternative route crosses pronghorn nonlimiting range in the Castle Valley area. Alternative COUT-I in Utah crosses elk crucial year-long habitat west of Price; and crucial spring/fall, winter/spring and year-long habitat on Manti-La Sal National Forest. The alternative route crosses elk crucial winter range north of Huntington and Cleveland in an area of existing oil and gas development, and on Uinta and Manti-La Sal National Forests. Alternative COUT-I also crosses mule deer crucial winter range in the vicinity of Nine Mile Canyon and Price/Huntington and pronghorn crucial year-long habitat east of Price.

Environmental Consequences (Utah)

Alternative COUT-I

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

Mammals

Big Game

Based on the impact assessment criteria (Table 3-79), residual impacts on elk, mule deer, pronghorn and Rocky Mountain bighorn sheep populations by Alternative COUT-I in Utah would be low (Table 3-93).

Impacts on big game crucial habitat crossed by Alternative COUT-I in Utah would be primarily low, with some areas of nonidentifiable impacts. Impacts for Alternative COUT-I would be greater than the impacts COUT-C, COUT-H, COUT-B, and COUT-A, respectively.

Results of Additional Analysis of Potential Impacts

After the application of seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) during times when big game use specific seasonal habitats, impacts from Alternative COUT-I would be limited to minor loss of forage in seasonal habitat areas, a potential increase in the weeds, human presence and activity in these habitats due to construction of new access routes. These effects are not anticipated to adversely influence big game populations in the Project area. For additional discussion on big game herds likely to be affected in Utah, refer to the discussion for Alternative COUT-A.

Results of U.S. Forest Service Specialist Reports

The USFS evaluated whether implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to wildlife resources contained in the applicable USFS LRMPs. The results of these analyses are presented in the Wildlife Specialist Report which is available for review and download from the Project website. The analysis found that Alternative COUT-I could be approved in compliance with standards, guidelines, and management objectives pertaining to wildlife resources contained in applicable USFS LRMPs. circumvent

3.2.7.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A (MV-8 and MV-9) would be located on the Wyoming/Colorado state line in sagebrush, grassland, and pinyon-juniper habitat. In Wyoming, the Siting Area A would be located in elk, mule deer and pronghorn crucial yearlong habitat, and migration corridors. In Colorado, the Siting Area A would be located in mule deer critical winter range and nonlimting range, and pronghorn nonlimiting range.

Siting Area A would also be located in the Powder Rim Bird Habitat Conservation Area (BHCA) in Wyoming, and the Routt and Moffat County Uplands BHCA in Colorado, which are important areas for migratory birds associated with sagebrush, pinyon-juniper, and desert scrub vegetation communities.

Environmental Consequences

The estimated area of disturbance (in acres) to elk, mule deer and pronghorn nonlimiting habitat from the Powder Wash series compensation station is included in the disturbance analysis for Alternative WYCO-B and route variations (Tables 3-84 and 3-85). Siting area a is located in habitats used by local elk, mule deer and pronghorn populations, including the Bitter Creek herd in Wyoming as described in WYCO-B Environmental Consequences 500kV Transmission Line.

If the series compensation station is constructed in elk, mule deer, and pronghorn habitats in Siting Area A, crucial/critical habitat use and migration routes could be temporarily affected during the construction period. After the application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities during times that elk, mule deer and pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas,

a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. Siting Area A is located in an area of previous anthropogenic disturbance, which includes heavy oil and gas development that local big game populations tolerate and continue to use seasonal habitat in the area. Therefore effects from siting the Powder Wash series compensation station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local big game populations in Wyoming and Colorado over the long-term.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from Powder Wash series compensation station is included in the disturbance analysis for Alternative WYCO-B and route variations. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Powder Wash series compensation station could result in loss or alteration of migratory bird nesting and foraging habitat associated with sagebrush, pinyon-juniper, and desert scrub vegetation communities, particularly in the Powder Rim and Routt and Moffat County Uplands BHCAs. After the application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), impacts on migratory birds would be limited to localized loss and modification of migratory bird habitat and potential changes in migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B (MV-8 and MV-9) would be located where Alternative WYCO-B and route variations diverge in Nine Mile Basin in Colorado. Siting Area B would be located in sagebrush, grassland, and pinyon-juniper habitat; and sited in elk severe winter range, summer concentration areas, calving grounds, non-limiting habitat, and the western edge of elk migration corridors in Moffat County. Siting Area B also would be located in mule deer critical winter range; and pronghorn severe winter range, and nonlimiting range.

Siting Area B would be located in the Routt and Moffat County Uplands BHCA, and in the vicinity of the Little Snake River. The Routt and Moffat County Uplands BHCA is an important area for migratory birds associated with sagebrush, pinyon-juniper, and desert scrub vegetation communities; while the Little Snake provides wetland and riparian habitat for more than 150 bird species (Intermountain West Joint Venture 2012).

Environmental Consequences

The estimated area of disturbance (in acres) to designated elk, mule deer and pronghorn habitat from the Nine Mile Basin series compensation station is included in the disturbance analysis for Alternative WYCO-B and route variations (Tables 3-87 and 3-88). Siting Area B would be located in habitat used by local elk, mule deer and pronghorn populations in Colorado, including the E-2 (Bears Ears) elk herd that is the second largest elk herd in the U.S. If the series compensation station is constructed in elk, mule deer, and pronghorn habitats in Siting Area B, habitat use, including severe/critical habitat and calving grounds could be temporarily affected during the construction period. Severe/critical winter range availability is a limiting factor for both elk and mule deer. However, the application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities would reduce impacts on big game during sensitive times. Therefore impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. Overall, effects from siting the Nine Mile Basin series

compensation station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local elk, mule deer and pronghorn populations in Colorado.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Nine Mile Basin series compensation station is included in the disturbance analysis for Alternative WYCO-B and route variations. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Nine Mile Basin series compensation station could result in loss or alteration of migratory bird nesting and foraging habitat associated with sagebrush, pinyon-juniper, and desert scrub vegetation communities in the Routt and Moffat County Uplands BHCA; and riparian and wetland habitat on the Little Snake River. The application of Selective Mitigation Measure 7 (spanning or avoiding of sensitive features) would reduce impacts on avian species in sensitive riparian and wetland areas. Application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), would limit impacts on migratory birds to localized loss and modification of migratory bird habitat and potential changes in some migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Siting Area C – Maybell

Affected Environment

In Colorado, Siting Area C would be located where Alternative WYCO-B and route variations diverge in the Tuttle Ranch Conservation Easement area. Wildlife habitat includes riparian, agricultural, big sagebrush, shrub/shrub steppe, barren/sparsely vegetated, grassland, and pinyon-juniper vegetation communities. The Maybell Series Compensation Station Siting Area would be located in elk severe winter range, summer concentration areas, calving grounds, and non-limiting habitat; and mule deer and pronghorn critical/severe winter range and nonlimiting habitat.

Siting Area C would be located in the Yampa BHCA, which is an important area for migratory birds, waterfowl and shorebirds (Intermountain West Joint Venture 2012). The Yampa River corridor is a waterfowl conservation priority area; providing breeding and wintering habitat, and fall migration stopover habitat for waterfowl in Colorado (CPW 2011b).

Environmental Consequences

The estimated area of disturbance (in acres) to designated elk, mule deer and pronghorn habitat from the Maybell series compensation station is included in the disturbance analysis for Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Tables 3-87 and 3-88). Siting Area C would be located in habitat used by local elk, mule deer and pronghorn populations in Colorado, including the E-2 (Bears Ears) and E-6 (White River) elk herds, which are the largest elk herds in the U.S., and of great regional economic importance in Colorado. Habitat in the Tuttle Ranch Conservation Easement area is considered high-quality winter range and important migratory routes for elk, mule deer and pronghorn (CPW 2013a). If the series compensation station is constructed in elk, mule deer, and pronghorn habitats in Siting Area C, habitat use could be temporarily affected during the construction period. The availability of severe/critical winter range is a limiting factor for big game. However, the application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities would reduce impacts on big game during sensitive times, and impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. Overall, effects from siting the Maybell series compensation station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local big game populations in Colorado.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Maybell series compensation station is included in the disturbance analysis for Alternative WYCO-B and route variations. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Maybell Series Compensation Station could result in loss or alteration of migratory bird nesting and foraging habitat in the Yampa BHCA; and riparian and wetland habitat used for breeding and wintering habitat, and fall migration stopover habitat along the Yampa River corridor. The application of Selective Mitigation Measure 7 (spanning or avoiding of sensitive features) would reduce impacts on avian species in sensitive riparian and wetland areas associated with the Yampa River. Application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), would limit impacts on migratory birds to localized loss and modification of migratory bird habitat and potential changes in some migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D (MV-8 and MV-9) would be located in wildlife habitat that includes sagebrush, shrub/shrub steppe and pinyon-juniper vegetation communities just south of U.S. Highway 40, west of Craig. The Bell Rock Series Compensation Station Siting Area would be located in elk severe winter range, migration corridors, and non-limiting habitat; and in mule deer critical winter range. Siting Area D also is located in pronghorn severe winter range and nonlimiting habitat.

Siting Area D would be located in the Routt and Moffat County Uplands and Yampa BHCAs, which are important sagebrush, pinyon-juniper, and desert scrub habitats; and wetland and riparian habitats for migratory birds (Intermountain West Joint Venture 2012). Siting Area D would be located in the vicinity of the Yampa River corridor, which is a waterfowl conservation priority area; providing breeding and wintering habitat, and fall migration stopover habitat for waterfowl in Colorado (CPW 2011b).

Environmental Consequences

The estimated area of disturbance (in acres) to designated elk, mule deer and pronghorn habitat from the Bell Rock series compensation station is included in the disturbance analysis for Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 (Tables 3-87 and 3-88). Siting Area D would be located in habitat used by local elk, mule deer and pronghorn populations in Colorado, including the E-2 (Bears Ears) elk herd, which is the second largest elk herd in the U.S. If the series compensation station is constructed in elk, mule deer, and pronghorn habitats in Siting Area D, habitat use and seasonal migration could be temporarily affected during the construction period, although unlikely to be permanent as local big game populations have adapted to previous anthropogenic disturbance in the proposed series compensation station siting area. The application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities would reduce impacts on big game during sensitive times, and impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. Overall, effects from siting the Bell Rock Series Compensation Station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local big game populations in Colorado.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Bell Rock series compensation station is included in the disturbance analysis for Alternative WYCO-D and route variations. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Bell Rock Series Compensation Station could result in loss or alteration of migratory bird nesting and foraging habitat in the Yampa BHCA; and riparian and wetland habitat used for breeding and wintering habitat, and fall migration stopover habitat along the Yampa River corridor. The application of Selective Mitigation Measure 7 (spanning or avoiding of sensitive features) would reduce impacts on avian species in sensitive riparian and wetland areas associated with the Yampa River. Application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), would limit impacts on migratory birds to localized loss and modification of migratory bird habitat and potential changes in some migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G (MV-8 and MV-9) would be located in an area previously disturbed by the I-70 corridor and U.S. Highway 6; approximately 5 miles west of the Green River. Wildlife habitat is predominantly barren, and shrub/shrubsteppe habitat, interspersed with pinyon juniper. Siting Area G would be located in pronghorn crucial yearlong habitat; but would not impact elk, mule deer, Rocky Mountain bighorn sheep, or moose populations in Utah. Siting Area G would not be sited in known BHCAs in Utah.

Environmental Consequences

The estimated area of disturbance (in acres) to pronghorn crucial yearlong habitat from the Green River series compensation is included in the disturbance analysis for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E (Tables 3-92 and 3-93). If the series compensation station is constructed in pronghorn habitats in Siting Area G, habitat use could be temporarily affected during the construction period, although local populations are likely to have adapted to previous anthropogenic disturbance in the siting area. After the application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities during times that mule deer and pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. However, the effects from siting the Green River series compensation station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local pronghorn populations in Utah.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Green River series compensation station is included in the disturbance analysis for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Green River series compensation station could result in loss or alteration of migratory bird nesting and foraging habitat associated with shrub/shrubsteppe and pinyon juniper vegetation communities. After the application of Design Features 4, 6, and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), impacts on migratory birds would be limited to localized loss and modification of migratory bird habitat and potential changes in migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence, and construction activities.

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F (MV-8 and MV-9) would be located in an area previously disturbed by agriculture and U.S. Highway 40 in the vicinity of Roosevelt. Wildlife habitat is predominantly agricultural land, barren, sage-brush, and shrub/shrubsteppe vegetation communities. Siting Area F would be located in mule deer and pronghorn crucial yearlong habitat; but would not impact elk, mule deer, Rocky Mountain bighorn sheep, or moose populations in Utah.

Siting Area F would not be sited in known BHCAs in Utah. Siting Area F would be located north of the Duchesne River and northwest of Pelican Lake, the Green River, and Ouray National Wildlife Refuge, which represent important migratory bird lowland riparian, wetland and shrub/shrubsteppe habitats.

Environmental Consequences

The estimated area of disturbance (in acres) to mule deer and pronghorn crucial yearlong habitat from the Roosevelt series compensation station is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1 (Tables 3-94 and 3-95). If the series compensation station is constructed in mule deer and pronghorn habitats in Siting Area F, habitat use could be temporarily affected during the construction period, although local populations are likely to have adapted to previous anthropogenic disturbance in the siting area. After the application of Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities during times that mule deer and pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. However, the effects from siting the Roosevelt Series Compensation Station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local mule deer and pronghorn populations in Utah.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Roosevelt series compensation station is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Roosevelt Series Compensation Station could result in loss or alteration of migratory bird nesting and foraging habitat associated with agricultural land, barren, sage-brush and shrub/shrubsteppe vegetation communities. The application of Selective Mitigation Measure 7 (spanning or avoiding of sensitive features) would reduce impacts by potentially siting the Roosevelt Series Compensation Station outside of known flight paths to and from the Green River, Ouray National Wildlife Refuge and Pelican Lake habitat areas. After the application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), impacts on migratory birds would be limited to localized loss and modification of migratory bird habitat and potential changes in migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E (MV-8 and MV-9) would be located in an area previously disturbed by oil and gas development, and the Bonanza Power Plant. Wildlife habitat is predominantly sagebrush and shrub/shrubsteppe. The Bonanza Series Compensation Station Siting Area would be located in pronghorn crucial yearlong habitat and fawning habitat; but would not impact elk, mule deer, Rocky Mountain bighorn sheep or moose populations in Utah.

Siting Area E would not be sited in known BHCAs in Utah, but would be sited approximately 15 miles east of the Green River and the Ouray National Wildlife Refuge, which represent important migratory bird lowland riparian, wetland and shrub/shrubsteppe habitats.

Environmental Consequences

The estimated area of disturbance (in acres) to pronghorn crucial yearlong and fawning habitat from the Bonanza series compensation station is included in the disturbance analysis for Alternative COUT-C and route variations (Tables 3-94 and 3-95). If the series compensation station is constructed in pronghorn habitats in Siting Area E, habitat use could be temporarily affected during the construction period. After the application of Selective Mitigation Measure 12 (seasonal and spatial restrictions) on construction and maintenance activities during times that pronghorn use specific seasonal habitats, impacts would be limited to minor loss of forage in seasonal habitat areas, a potential for introduction or spread of weeds, and an increase in human use and activity in these habitats. However, the effects from siting the Bonanza Series Compensation Station would be limited to loss of forage resources in the site, and are not anticipated to adversely influence local pronghorn populations in Utah.

The estimated area of disturbance (in acres) to migratory bird nesting and foraging habitat from the Bonanza series compensation station is included in the disturbance analysis for Alternative COUT-C and route variations. Detailed analysis of potential impacts on migratory birds is included in Sections 3.2.7.4.3 and 3.2.7.5. Activities related to the construction and maintenance of the Bonanza Series Compensation Station could result in loss or alteration of migratory bird nesting and foraging habitat associated with sage-brush and shrub/shrubsteppe vegetation communities. After the application of Design Features 4, 6 and 7 (avian-safe design standards, seasonal restrictions for nesting migratory birds, and preconstruction migratory bird nest surveys), impacts on migratory birds would be limited to localized loss and modification of migratory bird habitat and potential changes in migratory bird behavior due to individual and species-specific response to anthropogenic disturbance as a result of increased noise, human presence and construction activities.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.8 Special Status Wildlife

3.2.8.1 Introduction and Regulatory Framework

This section addresses potential impacts on special status wildlife from the No Action Alternative and other alternative routes, considered for the Project.

Special status species include species listed as threatened, endangered, or candidates for listing under the ESA, species listed as sensitive by the USFS, BLM, or states affected by the Project, and species listed as threatened or endangered by states affected by the Project. Unless a species is also assigned one of the designations described above, USFS MIS are addressed under wildlife (Section 3.2.7) and not included in this special status wildlife section. Also, special status plants (Section 3.2.6) and fish and aquatic resources (Section 3.2.9) are addressed separately in this document.

3.2.8.1.1 Regulatory Framework

Implementation of the Project must be consistent with the statutes, regulations, plans, programs, and policies of affiliated tribes, federal agencies, and state and local governments.

Federal

- The ESA (16 U.S.C. 1531 to 1544), as amended, provides broad protection for species of fish, wildlife, and plants listed as threatened or endangered by the FWS. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. All federal agencies in consultation with and with the assistance of the FWS, also must use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species. All federal agencies, in consultation with, and with the assistance of, the FWS must ensure any action authorized, funded, or carried out by federal agency is not likely to jeopardize the continued existence of an endangered, threatened, or proposed listed species, or result in destruction or adverse modification of a critical habitat of a species. Agencies are required to use the best scientific and commercial data available to fulfill this charge.
- The MTBA of 1918 (16 U.S.C. 703-712) provides it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess any migratory bird, part, nest, egg or product, manufactured or not.
- The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) prohibits the "taking" or possession or any commerce of bald or golden eagles. The definition of "take" includes: pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.
- The BLM UT-IM-2010-071 identifies management actions necessary at some sites to ensure environmentally responsible exploration, authorization, leasing, and development of renewable and nonrenewable energy resources in the ranges of the Gunnison sage-grouse and greater sage-grouse.
- The BLM WO-IM 2012-043 provides interim conservation policies and procedures to the BLM field officials to be applied to ongoing and proposed authorizations and activities that affect the greater sage-grouse (*Centrocerus urophasianus*) and its habitat while the BLM develops and decides how to best incorporate long-term conservation measures into applicable land use plans.
- The BLM WY-IM 2013-005 provides guidance for migratory bird conservation policy on Wyoming BLM-administered public lands including the federal mineral estate.
- BLM Manual 6840 provides BLM's special status species management policy and guidance for the conservation of special status species and their habitats. Under this policy, special status species include animal and plant species listed as threatened or endangered, proposed for listing, or candidates for listing under the provisions of the ESA; those listed as sensitive species by a state; and those listed by a BLM State Director as sensitive. The objective of this policy is to ensure actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, under provisions of the ESA.
- Interim conservation recommendations were provided in October 2012 for greater sage-grouse habitat in USFS Regions 1, 2, and 4. USFS is engaged in a planning process to determine whether to amend 20 LRMPs to incorporate sage-grouse conservation measures with a target decision date of September 2014. The intent of these interim recommendations is to promote conservation of sustainable sage-grouse populations and their habitats while not limiting future options before the plan amendment process can be completed.

- The Platte River Recovery Implementation Program, established in 1997, implements actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the states of Wyoming, Nebraska, and Colorado, as well as the USDI. The Platte River Recovery Implementation Program addresses the adverse impacts of existing and certain new water-related activities on the Platte River target species and associated habitats, and provides ESA compliance for effects on the target species.
- Interim conservation recommendations were provided in October 2012 for greater sage-grouse and greater sage-grouse habitat in USFS Regions 1, 2, and 4. The USFS is engaged in a planning process to determine whether to amend 20 LRMPs to incorporate sage-grouse conservation measures with a target decision date of September 2014. The intent of these interim recommendations is to promote conservation of sustainable sage-grouse populations and their habitats while not limiting future options before the plan amendment process can be completed.
- BLM-WY Sage-grouse IM 2012-019 provides guidance to Wyoming BLM Field Offices on sage-grouse habitat management for proposed activities and resource management planning. It is the policy of Wyoming BLM to manage sage-grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the WGFD.
- The CUP Act of 1992 (P.L. 102-575), which included authorization of the URMCC as an Executive branch agency of the federal government. The Act set terms and conditions for completing the CUP, which diverts, stores and delivers large quantities of water from numerous Utah rivers. The URMCC is responsible for designing, funding and implementing projects to offset the impacts on fish, wildlife and related recreation resources caused by CUP and other federal reclamation projects in Utah. Lands owned and managed by the URMCC for CUP mitigation commitments are located in the Project area.
- BLM RMPs, Management Framework Plans for Wyoming, including Rawlins (2008) Field Office; for Colorado, including White River (1997, as amended), Little Snake (1989, as amended), and Grand Junction (1987, as amended); for Utah, including Richfield (2008), Fillmore (1987), Moab (2008), Price (2008) and Vernal (2008) Field Offices, and Salt Lake District (1990), specify regulations and goals for management of BLM-administered land and set restrictions to protect fish and wildlife and the habitats on which they depend. Many of these documents also describe the locations and approximate quantities of known noxious weed species in the jurisdictional boundaries of the field offices.

State

Wyoming

- Wyoming Sage-grouse Local Working Groups oversee two conservation areas that could be crossed by the Project (from east to west): Bates Hole/Shirley Basin and South-central. These Working Groups have developed a Conservation Plan detailing the natural history, threats, and mitigation measures for sage-grouse in each conservation plan area; and guidelines for any Project activities occurring in the area.
- Executive Order 2011-5 (Greater Sage-Grouse Core Area Protection) outlines the management of greater sage-grouse including the designation of Core Population Areas in the state of Wyoming.
- The Wyoming SWAP was published in 2005 and revised in 2010. The Plan is a coordinated, comprehensive conservation strategy designed to maintain the health and diversity of wildlife, including species with low and declining populations in the state of Wyoming.

- Wyoming State Code Section 23-1-101 defines wildlife as all wild mammals, birds, fish, amphibians, reptiles, crustaceans and mollusks, and wild bison designated by the Wyoming Game and Fish commission and the Wyoming Livestock Board in the state.
- Wyoming State Code Section 23-1-103 states all wildlife is the property of the state of Wyoming; and directs the control, propagation, management, protection and regulation of wildlife in the state.
- Wyoming State Code Section 23-3-108 states it is a violation to take or intentionally destroy the nest or eggs of any non-predacious bird in the state of Wyoming.
- Wyoming State Code Section 23-3-101 prohibits the take of eagles.
- Wyoming State Code Section 23-3-103 prohibits the take of any furbearing animal or game bird without the appropriate license in the state of Wyoming.

Colorado

- The Colorado SWAP 2006 is a comprehensive management strategy developed by CDOW and the State of Colorado to conserve native species populations and habitats, and prevent additional federal listings.
- Colorado State Code Statute 33-2-101 provides the State's intent to protect wildlife in Colorado under the Nongame, Endangered, or Threatened Species Conservation Act.
- Colorado State Code Statute 33-2-104 regulates the take, possession, transportation, exportation, processing, sale or offering for sale, or shipment as may be deemed necessary to manage nongame wildlife in the state.
- Colorado Sage-grouse Local Working Groups oversee three conservation areas that could be crossed by the Project (from east to west): Northwest Colorado, Piceance/Parachute/Roan Creek, and Pinon Mesa. These Working Groups have developed a Conservation Plan detailing the natural history, threats, and mitigation measures for sage-grouse in each conservation plan area; and conservation guidelines for any project activities occurring in the area.

Utah

- UAC R657-48 directs the UDWR to maintain a Utah Sensitive Species List that identifies plant and animal species (1) listed, or candidates for listing, pursuant to the ESA; (2) for which a conservation agreement is in place; or (3) whose population viability is threatened in Utah (i.e., wildlife species of concern). Timely and appropriate conservation actions implemented on behalf of species listed on the Utah Sensitive Species List will preclude the need to list these species under the provisions of the federal ESA.
- The Utah SWAP 2005 is a comprehensive management plan designed to conserve native species populations and habitats in Utah, and prevent the need for additional federal listings.
- Utah State Code Section 23-14-1 directs the UDWR to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state. This statute also authorizes UDWR to identify and delineate crucial seasonal wildlife habitats.
- Utah PIF Avian Conservation Strategy, Version 2.0 prioritizes avian species and their habitats and sets objectives designed to determine which species are most in need of immediate and continuing conservation effort. The other purpose of the strategy is to recommend appropriate conservation actions required to accomplish stated objectives.
- The *Conservation Plan for Greater Sage-grouse in Utah* was approved by the Governor in April 2013. The plan establishes incentive-based conservation programs for conservation of sage-

grouse on private, local government, and SITLA land and regulatory programs on other state- and federally managed lands. The Conservation Plan also establishes sage-grouse management areas and implements specific management protocols in these areas.

- Utah Sage-grouse Local Working Groups oversee three conservation areas that could be crossed by the Project: Uinta Basin, Strawberry Valley, and Castle Country. Each of these Working Groups have developed a Conservation Plan detailing the natural history, threats, and mitigation measures for sage-grouse in each conservation plan area; and conservation guidelines for any activities occurring in the area.

3.2.8.2 Issues Identified for Analysis

Issues concerning potential impacts of Project construction, operation, and maintenance on special status wildlife were identified through coordination and cooperation with BLM, USFS and FWS resource specialists, state wildlife agencies, conservation groups and trusts, and members of the public during the scoping process. Issues considered for analyses in the EIS are summarized in Table 3-96. Key issues raised by the public and the agencies during scoping regarding potential impacts on federally listed, BLM-, USFS- and state-sensitive wildlife for which comparable data were available for all alternative routes were selected for use in the comparison of alternative routes.

TABLE 3-96
SPECIAL STATUS WILDLIFE ISSUES IDENTIFIED FOR ANALYSIS

Issue Identified	Analysis Considerations
Birds	
Impacts on greater sage-grouse: ▪ Increased predation pressure by raptors ▪ Modification/loss of sagebrush habitat ▪ Disruption of breeding (lek) activities and seasonal movements ▪ Contribution to impacts identified in the U.S. Fish and Wildlife Service 5-factor listing analysis (75 FR 13910).	▪ Extent of mapped sage-grouse core areas and priority habitats, general habitats, and habitats within 4 miles of known leks potentially disturbed by the Project ▪ Proximity of the Project to known leks ▪ Number of sage-grouse that attend affected leks ▪ Quality and importance of sage-grouse habitats crossed for maintaining local populations
Impacts on habitat for raptors, migratory, wetland and waterfowl birds; including whooping crane, southwestern willow flycatcher, mountain plover, and western yellow-billed cuckoo	▪ Extent of habitat potentially affected by the Project (southwestern willow flycatcher, mountain plover, and yellow-billed cuckoo) ▪ Proximity of the Project to known nest sites (special status raptors) ▪ Identification of alternative routes that could require consultation under the Platte River Recovery Implementation program due to downstream effects of water use from the Platte River drainage on designated habitat
Impacts on upland game bird habitats including Columbia sharp-tailed grouse	▪ Qualitative assessment of impacts on potentially suitable Columbia sharp-tailed grouse habitat in the Project area ▪ Extent of habitat potentially affected by the Project
Mammals	
Impacts on special status mammal species including black-footed ferret, Wyoming pocket gopher, pygmy rabbit, kit fox, and white-tailed prairie dog	▪ Extent of habitat potentially affected by the Project (black-footed ferret, pygmy rabbit, and white-tailed prairie dog) ▪ Qualitative assessment of impacts on potentially suitable special status mammal habitats in the Project area (Wyoming pocket gopher and kit fox)
Impacts on special status reptiles including northern tree lizard and Great Basin gopher snake	Qualitative assessment of impacts on potentially suitable special status reptile habitats in the Project area

3.2.8.3 Regional Setting

Ecoregions potentially crossed by the Project and general ecological conditions in the Project area are described in Section 3.2.5. The regional setting and ecological mechanisms that affect special status wildlife, including population dynamics and species dispersal, are similar to those described in Section 3.2.7.

Additionally, maintenance of vegetation communities that occur in the Project Area, which are identified as priority habitat types for conservation actions in the SWAPs for Wyoming (aspen, mixed mountain shrub, sagebrush, grassland, riparian, and wetlands), Colorado (forestlands, grasslands, riparian/wetlands, and shrublands) and Utah (riparian, wetlands, shrub-steppe, mountain shrub, water, wet meadows, grasslands, and aspen), is critical to preservation of federally listed, USFS-, BLM-, and state-sensitive wildlife.

Special status wildlife species include those species either listed or proposed for listing under the ESA, identified as sensitive by the USFS Regional Forester, and/or species designated as BLM-sensitive by a state director. Determining factors in special status wildlife designation include population demographics; species range-wide distribution; quality, quantity, and distribution of available habitat, threats and impacts on the species and associated habitat; and existence of recovery or conservation strategies or other formalized conservation planning efforts. Special status wildlife species are typically limited to a specialized habitat type or have a narrow distribution and have incurred habitat loss and/or population declines with the potential for reoccurring threats to population viability and associated habitats. For example, riparian habitats are limited in extent in the alternative route study corridors and two of the riparian/wetland-obligate special status birds analyzed in this EIS (southwestern willow flycatcher and yellow-billed cuckoo) require continuous riparian corridors containing the multi-storied canopy required for nesting yellow-billed cuckoos for example (Corman and Wise-Gervais 2005), as well as the necessary minimum patch sizes of habitats for breeding/foraging suitability (Ehrlich et al. 1988). Therefore, any fragmentation to the currently limited contiguous riparian corridors could affect adversely yellow-billed cuckoo and southwestern willow flycatchers in the Project area.

3.2.8.4 Study Methodology

3.2.8.4.1 Inventory

Special status species include species listed as threatened, endangered, or candidates for listing under the ESA, species listed as sensitive by the USFS, BLM, and species assigned a special status by the state of Wyoming, Colorado or Utah. Lists of special status species that may occur in the Project area were collected from the FWS (county level), BLM (state level), USFS (forest level), and states that would be crossed by the Project (state and county level). Specifically, the following lists of special status species were collected:

Federal Threatened, Endangered, and Candidate Species

- Wyoming – Carbon (FWS 2011a) and Sweetwater (FWS 2011e) counties
- Colorado – Garfield, Mesa, Moffatt, and Rio Blanco counties (FWS 2011f)
- Utah – Carbon, Duchesne, Emery, Grand, Juab, Uintah, Utah, and Wasatch counties (FWS 2011g)

State Protected Species

- Wyoming
  - Terrestrial special status wildlife – Wyoming Game and Fish Nongame Species of Special Concern. January 2005 (WGFD 2005a, b)
  - Special status birds – Wyoming Game and Fish Nongame Species of Special Concern. January 2005 (WGFD 2005b)
- Colorado
  - List of animals – Colorado Threatened & Endangered List. July 7, 2010 (CPW 2010)
- Utah
  - List of animals – Utah's State Listed Species by County. March 29, 2011 (UDWR 2011a)

BLM Statewide Sensitive Species

- Wyoming
  - BLM Wyoming Sensitive Species Policy and List by Field Office (Rawlins). March 31, 2010 (BLM 2010b)
- Colorado
  - Colorado BLM State Director's Sensitive Species List by Field Office (Little Snake, White River, and Grand Junction). November 20. 2009 (BLM 2009c)
- Utah
  - Terrestrial special status wildlife – Utah BLM Sensitive Fish and Wildlife Species List. December 20, 2011 (BLM 2010c)
  - Special status plants – Interim BLM Sensitive Plant List - from state office. February 1, 2011 (BLM 2011d)

U.S. Forest Service Region 4 Sensitive Species

- Region 4 – Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species Known and Suspected Distribution by Forest (USFS 2013a)

Distribution and occurrence data (Table 3-97) for special status wildlife were collected from BLM, FWS, USFS, and from the Wyoming, Colorado, and Utah state heritage programs to identify special status species likely to occur in the Project area. In addition to these data, agency personnel were consulted to identify specific species' ranges in the Project area and relevant scientific literature, agency publications, and online databases (e.g., NatureServe [2012] WWF Wildfinder [2006] and IUCN Redlist [2012]) were reviewed.

The geographic scope of data collected for special status wildlife varied based on the habitat requirements of individual species as well as the availability of potentially suitable habitat for each species in the Project area. For most special status species, data were collected for the 2-mile-wide alternative route study corridors (i.e., 1 mile on either side of the reference centerline) for each alternative transmission line route. The potential for the occurrence of special status species in areas adjacent to the alternative route study corridors was considered to identify potential impacts of the Project on animal activity patterns and seasonal migrations. For wide-ranging species (e.g., large mammalian predators and big game species) and species with habitat that could be affected indirectly (e.g., effects of water use from the Platte River drainage on whooping crane habitat), the data were collected for use in the analysis from the predicted species distribution (IUCN 2012; Meaney and Beauvais 2004), or potential habitat of the species in the Project area in Wyoming, Colorado and Utah.

Using the information collected, the full list of special status species was refined to include only species likely to occur in the Project area, and is presented Appendix E, Table E-9. Detailed species descriptions, life history, status, and occurrence information for each special status species that may occur in the

Project area were compiled and are included in Appendix E. This information provides relevant natural history and species distribution information used in the analysis of direct, indirect, and cumulative effects on each special status species.

Geospatial data delineating known habitats including nest sites, lek locations, and other important potential habitats for special status species likely to occur in the Project area were obtained from the agencies and used to quantify potential impacts on species and compare the types of potential effects of the alternative routes. Spatial data were limited or unavailable for many special status species. To fill some data gaps identified and provide a basis for comparing the types of potential effects of the alternative routes, habitat modeling was conducted for some key species in the alternative route study corridors (Environmental Planning Group [EPG] 2013). The best available spatial data for each special status wildlife habitat collected and used in the analysis of potential effects are identified in Table 3-97. Species specific impacts for federally listed, USFS-MIS, and USFS-sensitive species occurring on the Ashley, Manti-La Sal, and Uinta National Forests are analyzed in the Special Status Wildlife Specialist Report (USFS 2013c).

TABLE 3-97
SPECIAL STATUS WILDLIFE SPECIES SPATIAL INFORMATION USED IN IMPACT ANALYSIS

Common Name	Scientific Name	Type and Source of Spatial Data
Birds		
Bald eagle	*Haliaeetus leucocephalus*	Winter concentration areas (Colorado Parks and Wildlife [CPW] 2011c) Winter roost sites (Bureau of Land Management [BLM] 2011e; CPW 2012fd) Nest site locations (BLM 2009d, 2011i; Colorado Natural Heritage Program [CNHP] 2011; CPW 2012g; Utah Natural Heritage Program [UNHP] 2012; Wyoming Natural Diversity Database [WYNDD] 2011)
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	Lek and winter range locations (CPW 2011d, e; Wyoming Game and Fish Department [WGFD 2009a])
Golden eagle	*Aquila chrysaetos*	Nest locations (BLM 2011f) Species occurrences (UNHP 2012)
Greater sage-grouse[1]	*Centrocercus urophasianus*	Overall distribution (CPW 2012h) Lek locations (CPW 2012i; Utah Division of Wildlife Resources [UDWR] 2011b; WGFD 2012c) Core habitat areas (WGFD 2010b) Preliminary priority and preliminary general habitats (CPW 2012j) Occupied, winter, and brood rearing habitats (UDWR 2011b, c) Lek count data Utah (UDWR 2013a), Colorado (CPW 2012i), and Wyoming (WGFD 2012b)
Ferruginous hawk	*Buteo regalis*	Nest site locations (BLM 2009d, 2011f; CNHP 2011; UNHP 2012; WYNDD 2011)
Northern goshawk	*Accipter gentilis*	Nest site locations (BLM 2009d, 2011f; CNHP 2011; UNHP 2012; U.S. Forest Service [USFS] 2011b, c; WYNDD 2011) Post-fledging area locations (U.S. Forest Service 2011d, e)
Mexican spotted owl	*Strix occidentalis lucida*	Habitat modeled in alternative route study corridors (Environmental Planning Group [EPG] 2013)

TABLE 3-97 SPECIAL STATUS WILDLIFE SPECIES SPATIAL INFORMATION USED IN IMPACT ANALYSIS		
Common Name	**Scientific Name**	**Type and Source of Spatial Data**
Mountain plover	*Charadrius montanus*	Habitat modeled in alternative route study corridors (EPG 2013)
Peregrine falcon	*Falco peregrinus anatum*	Nest site locations (BLM 2009d, 2011f; CNHP 2011; UNHP 2012; WYNDD 2011)
Southwestern willow flycatcher	*Empidonax traillii extimus*	Habitat modeled in alternative route study corridors (EPG 2013)
Swainson's hawk	*Buteo swainsoni*	Nest site locations (BLM 2009d, 2011f; CNHP 2011; UNHP 2012; WYNDD 2011)
Yellow-billed cuckoo	*Coccyzus americanus*	Habitat modeled in alternative route study corridors (EPG 2013)
Mammals		
Black-footed ferret	*Mustella nigripes*	Black footed-ferret management areas (BLM 2011g; UDWR 2011d) Reintroduction sites (BLM 2011h; UDWR 2011d)
Pygmy rabbit	*Brachylagus idahoensis*	Habitat modeled in alternative route study corridors (EPG 2013)
White-tailed prairie dog	*Cynomys leucurus*	Habitat modeled in alternative route study corridors (EPG 2013)
NOTE: [1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (UDWR 2011e) was considered to be synonymous with priority habitat.		

3.2.8.4.3 Impact Assessment and Mitigation Planning

Key issues involving potential impacts on federally listed, BLM-, USFS- and state-sensitive wildlife were raised by the public and the agencies during the scoping process. Where available, comparable spatial data along all alternative routes for special status wildlife resources identified for analysis during scoping were selected for use in the analysis to support an interdisciplinary comparison of alternative routes. The methodology used to assess potential impacts on special status wildlife resources in the interdisciplinary comparison of alternative routes is presented in Section 2.5.1 (refer to subheading Effects Analysis). In general, the analysis included (1) identifying the types of potential effects on special status wildlife that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) assessing level of initial impacts on special status wildlife present in the alternative route study corridors, (3) identifying appropriate selective mitigation measures for minimizing some potential adverse effects and determining specific areas where mitigation measures should be applied, and (4) disclosing the level of potential residual impacts on biological resources (i.e., impacts anticipated after application of selective mitigation measures). Design features incorporated in the Proposed Action for environmental protection (Table 2-8) were considered when assessing both initial and residual impacts on all resources.

Supplemental analyses were necessary to address some of the issues raised by the public and agencies during scoping. These analyses were performed using quantitative methods where special status wildlife resource spatial data were available to evaluate potential impacts of the Project and meet the requirements of relevant law, regulation, or policy. The methods for these supplemental analyses are discussed in the Effects Analysis section.

Types of Potential Effects

Direct and indirect effects of the Project on special status species would be similar to effects on other wildlife species described in Section 3.2.7. In addition to the effects on non-special status wildlife groups, specific direct and indirect effects relevant to special status wildlife species are discussed below.

The BLM performed an expanded analysis of the potential impacts on greater sage-grouse relative to other threatened, endangered, and candidate species in response to comments received during scoping, to maintain consistency with analysis of impacts on the species performed for other proposed transmission line projects, to address all requirements of the Framework for Sage-grouse Impacts Analysis for the Project (Appendix F), to demonstrate compliance with BLM WO IM 2012-043 and other agency sage-grouse policies, and to provide additional information for the public, cooperating agencies, and BLM regarding potential effects of the Project on sage-grouse while the BLM, USFS, and affected states revise their sage-grouse management policies. The analyses in Chapters 3 and 4 address direct and indirect impacts on greater sage-grouse and potential loss of sage-grouse that may occur as a result of the Project, including impacts on sage-grouse populations resulting from transmission lines identified in the FWS' 12-Month Findings for Petitions to List the Greater Sage-grouse as Threatened or Endangered (75 FR 13910). Documentation of ongoing planning for voluntary mitigation offered by the Applicant to offset effects identified in the analysis, including off-site mitigation is included in Appendix E.

Birds

Special Status Passerine and Waterfowl Birds

Direct Effects

Direct effects on special status passerine and waterfowl birds—including but not limited to American white pelican, black-crowned night heron, long-billed curlew, and Clark's grebe (refer to Appendix E, Section E.6.2 and Table E-9)—that may occur as a result of construction, operation, and maintenance of the Project include potential for bird mortality and injury, loss, degradation, and fragmentation of foraging, nesting, and sheltering habitat and potential disruptions of breeding activities. These effects are described in detail in Section 3.2.7.

Indirect Effects

Indirect effects on passerine and waterfowl birds that may occur as a result of construction, operation, and maintenance of the Project including potential for alternations to plant community composition, fire regimes, and habitat microclimate quantities and quality are described in Section 3.2.7. Indirect effects on birds could result in a reduction in breeding success and survival of individuals, and a potential reduction in population size of species in the Project area (Riffell et al. 1996).

The special status waterfowl species, the whooping crane, is a Platte River target conservation species with ESA-designated critical habitat (Platte River Recovery Implementation Program 1997) downstream of Project activities. Water withdrawal from the Platte River system during Project construction and maintenance activities may indirectly affect the whooping crane, and whooping crane designated critical habitat along the Platte River. Although neither species inhabit the Project area, the least tern and the piping plover are known to occur along the Platte River and may be indirectly affected through Project-related water use resulting in drawdown of water downstream in the Platte River.

Special Status Raptors and Migratory Birds

Direct Effects

The types of direct effects on special status raptors—including but not limited to ferruginous hawk, golden eagle, and northern goshawk (refer to Appendix E, Section E.6.2 and Table E-9)—and migratory birds would be the same as those described for raptors in Section 3.2.7.

Indirect Effects

The types of indirect effects on special status raptors and migratory birds would be the same as those described for raptors in Section 3.2.7.

Southwestern Willow Flycatcher and Yellow-Billed Cuckoo

Direct Effects

The primary direct effects of the Project (e.g., building new and improving existing access roads) on the southwestern willow flycatcher and yellow-billed cuckoo would include direct loss, degradation (removal or loss of necessary riparian vegetation for foraging and nesting), and fragmentation of the limited riparian habitat suitable for the species available in the alternative route study corridors.

Alteration of riparian habitat through the clearing of vegetation above 5 feet in height (to maintain a safe conductor distance, clearing of tower sites, and access roads) could result in fragmentation of suitable riparian habitats, as well as influencing whether habitats maintain a minimum effective territory size and the necessary connectivity required to support southwestern willow flycatcher populations (Sogge et al. 1997).

Disturbance through clearing of vegetation above 5 feet in height could decrease the extent of suitable nesting riparian habitat. A decrease in the available riparian habitats containing the multi-storied canopy required for nesting yellow-billed cuckoos specifically (Corman and Wise-Gervais 2005), could potentially adversely affect yellow-billed cuckoo populations in the Project area.

Indirect Effects

Indirect effects of the Project on the yellow-billed cuckoo and southwestern willow flycatcher include potential invasive plant introduction and/or spread in wetland/riparian communities resulting in a fewer native wetland and riparian plants and reduced quality nesting and brood rearing habitat. For example, inadequate vegetation density or canopy height to provide nesting structure as well as maintain relative humidity required to support the invertebrate prey-base necessary for foraging juveniles (Floyd et al. 2007) could result from the introduction and/or spread of invasive plants.

Special Status Upland Game Birds

Greater Sage-grouse

The methods used to identify and analyze potential effects on greater sage-grouse meet BLM and cooperating agency requirements for sage-grouse impact analysis and are consistent with the Framework for Sage-grouse Impacts Analysis for the Project (Appendix F). The information contained in the analysis will be used to evaluate and disclose the Project's potential effects on sage-grouse, compliance with applicable sage-grouse policies, and to identify effects for which the Applicant may provide commitments through a voluntary mitigation plan to (1) avoid or minimize the severity of specific effects, or (2) to provide off-site mitigation for effects that cannot be effectively avoided or mitigated on-site.

The direct and indirect effects analysis for sage-grouse was developed using a step-wise process. First, stressors and types of potential effects on sage-grouse were characterized for each Project activity and/or phase of the Project identified in the Applicant's Project Description (Section 2.3 and Appendix E). The characterization of stressors and effects was guided by concerns raised by agency biologists participating in the analysis and available scientific literature. The stressors and effects identified for each activity were organized in table format (Tables 3-98 and 3-99) to facilitate review. Second, each potential effect on sage-grouse was classified using the five factors (identified in section 4(a)(1) of the ESA) on which FWS makes listing decisions. An additional classification (for a total of six), direct loss of sage-grouse, was

also used to meet the requirements of the Framework for Sage-grouse Impacts Analysis for the Project (Appendix F). The classification of direct and indirect effects based on the six factors was organized in table format (Tables 3-98 and 3-99) to facilitate review. Finally, for each effect identified in previous steps, an evaluation of anticipated sage-grouse response and the severity of this response were performed. This evaluation (categorization of high, moderate, or low impact) was conducted using scientific literature regarding sage-grouse response to anthropogenic development and the best available information regarding the development of the Project from the Applicant.

Direct Effects

Table 3-98 identifies the potential direct impacts on sage-grouse of each Project activity and/or phase of the Project identified in the Applicant's Project Description (Section 2.3 and Appendix E).

Table 3-100 classifies each of the potential direct effects on sage-grouse identified in Table 3-98 based on the five factor analysis and threats identified in the FWS' 12-month findings on petitions to list greater sage-grouse under the ESA and the requirements of the Framework for Sage-grouse Impacts Analysis for the Project (Appendix F). The classification facilitates understanding of the Project's contribution to the threats to the species identified in the 12-month findings.

The effects of the Project related to each of the six factors included in Table 3-98 were evaluated based on the best available information regarding the development of the Project from the Applicant, scientific literature, and the professional judgment of agency biologists contributing to the analysis. For each impact factor and/or associated potential direct effect, the evaluation included an assessment of anticipated sage-grouse response and the severity of this response to the development of the Project.

None of the direct effects of the Project would contribute to overutilization (harvest of sage-grouse) or inadequacy of existing regulatory mechanisms. Therefore, neither overutilization nor inadequacy of existing regulatory mechanisms due to implementation of the Project is anticipated to contribute to the effects on sage-grouse identified in the 12-month findings of the FWS (Table 3-98). An evaluation of how overutilization and inadequacy of existing regulatory mechanisms affects sage-grouse that occupy habitats in the Project Area is included below.

<u>Overutilization (Harvest)</u>

In Wyoming and Colorado, recreational hunting of sage-grouse occurs in populations crossed by the Project but is not legal in sage-grouse populations crossed by the Project in Utah. FWS does not consider recreational hunting to be a primary cause of the range-wide declines of sage-grouse and did not identify regulations regarding sage-grouse hunting as inadequate in the 12-month findings on petitions to list the species under the ESA (75 FR 13910). In Colorado, CPW has successfully revised recreational hunting management of sage-grouse in populations crossed by the Project based on observed sage-grouse population trends. Due to this management, hunting is not considered to be a limiting factor in sage-grouse management in Northwest Colorado (Northwest Colorado Greater Sage-Grouse Working Group 2008). Similarly, in Wyoming WGFD regulates hunting of sage-grouse with a focus of maintaining hunting seasons and harvest levels that support maintenance and growth of sage-grouse populations (Christiansen 2010).

Utilization of sage-grouse for scientific, educational, and recreational purposes (lek viewing, scientific research including trapping and handling) occurs at low levels in Colorado, Wyoming, and Utah. These uses are not consumptive and are not likely to cause a disturbance to sage-grouse if proper scientific and viewing protocols are followed (Northwest Colorado Greater Sage-Grouse Working Group 2008).

TABLE 3-98
TYPES OF POTENTIAL DIRECT EFFECTS ON GREATER SAGE-GROUSE

Project Activity/Phase	Stressor[1]	Potential Effects
Construction		
▪ Access road improvement and construction ▪ Vegetation clearing ▪ Road building (grading, cut, and fill) ▪ Temporary access (drive and crush)	▪ Moving equipment ▪ Moving vehicles ▪ Removal of vegetation (sage-steppe habitat) ▪ Human presence ▪ Vehicle/equipment noise	▪ Mortalities due to collisions with moving equipment/vehicles ▪ Destruction of active nests by construction equipment/vehicles ▪ Loss of sage-grouse habitat through direct habitat conversion and as a result of avoidance behavior ▪ Degradation of habitat quality and function ▪ Fragmentation/reduction in connectivity among sage-grouse habitats ▪ Interruption of sage-grouse movement among populations (restricting gene-flow) ▪ Decreased nest initiation/success resulting from disruption of seasonal movement, brooding, wintering, or breeding (lekking) activities ▪ Decreased population survival and growth rates resulting from disruption to nesting females due to increased human presence and Project activities ▪ Increased susceptibility of sage-grouse to disease and predation resulting from physiological stress induced by noise and human presence
▪ Construction site preparation ▪ Work site vegetation clearing and grading ▪ Multi-purpose yards/staging areas vegetation clearing ▪ Equipment mobilization and material staging	▪ Moving equipment ▪ Moving vehicles ▪ Removal of vegetation (sage-steppe habitat) ▪ Human presence ▪ Vehicle/equipment noise	▪ Mortalities due to collisions with moving equipment/vehicles ▪ Destruction of active nests by construction equipment/vehicles ▪ Loss of sage-grouse habitat through direct habitat conversion and as a result of avoidance behavior ▪ Degradation of habitat quality and function ▪ Fragmentation of habitat ▪ Interruption of sage-grouse movement among populations (restricting gene-flow) ▪ Alteration of seasonal movements and breeding, brooding, or wintering bird behavior ▪ Increased susceptibility of sage-grouse to disease and predation resulting from physiological stress induced by noise and human presence

TABLE 3-98
TYPES OF POTENTIAL DIRECT EFFECTS ON GREATER SAGE-GROUSE

Project Activity/Phase	Stressor[1]	Potential Effects
▪ Construction of Project facilities ▪ Foundation excavation ▪ Tower assembly and erection ▪ Conductor, shield wire, and fiber optic ground wire stringing ▪ Series compensation station equipment installation ▪ Substation equipment installation	▪ Moving equipment ▪ Moving vehicles ▪ Human presence ▪ Vehicle/equipment noise	▪ Mortalities due to collisions with moving equipment/vehicles ▪ Destruction of active nests by construction equipment/vehicles ▪ Loss of sage-grouse habitat through direct habitat conversion and as a result of avoidance behavior ▪ Degradation of habitat quality and function ▪ Fragmentation of habitat ▪ Interruption of sage-grouse movement among populations (restricting gene-flow) ▪ Alteration of seasonal movements and breeding, brooding, or wintering bird behavior ▪ Increased susceptibility of sage-grouse to disease and predation resulting from physiological stress induced by noise and human presence
▪ Cleanup and site reclamation ▪ Equipment, material, and trash removal ▪ Re-contouring ▪ Site reclamation (topsoil spreading and seeding)	▪ Moving equipment ▪ Moving vehicles ▪ Vehicle/equipment noise ▪ Human presence ▪ Application of herbicides	▪ Mortalities due to collisions with moving equipment/vehicles ▪ Destruction of active nests by construction equipment/vehicles ▪ Interruption of sage-grouse movement among populations (restricting gene-flow) ▪ Decreased nest initiation/success resulting from disruption of seasonal movement, brooding, wintering, or breeding (lekking) activities ▪ Decreased population survival and growth rates resulting from disruption to nesting females due to increased human presence and Project activities ▪ Increased susceptibility of sage-grouse to disease and predation from physiological stress induced by noise and human presence
Operation		
▪ Routine inspections ▪ Aerial inspections (helicopter) ▪ Ground inspections (vehicle and pedestrian)	▪ Moving vehicles ▪ Human presence ▪ Vehicle noise	▪ Mortalities due to collisions with moving equipment/vehicles ▪ Interruption of sage-grouse movement among populations (restricting gene-flow) ▪ Alteration of seasonal movement, breeding, brooding, or wintering bird behavior

TABLE 3-98
TYPES OF POTENTIAL DIRECT EFFECTS ON GREATER SAGE-GROUSE

Project Activity/Phase	Stressor[1]	Potential Effects
▪ Operation of transmission line, substations, and series compensation stations	▪ Introduction/presence of tall structures (transmission line towers) on the landscape ▪ Introduction/presence of electromagnetic fields	▪ Mortalities due to collision with transmission lines, fences, guy wires, and conductors ▪ Avoidance of occupied habitat by sage-grouse due to presence of tall structures (transmission line towers) ▪ Avoidance of occupied habitats by sage-grouse due to electromagnetic fields
Maintenance		
▪ Access road maintenance	▪ Same as access road improvement and construction and cleanup/site reclamation	▪ Same as access road improvement, construction, and cleanup/site reclamation
▪ Transmission line maintenance/equipment replacement	▪ Same as construction of Project facilities and cleanup/site reclamation	▪ Same as construction of Project facilities and cleanup/site reclamation
▪ Right-of-way vegetation maintenance ▪ Herbicide use ▪ Temporary access (drive and crush) ▪ Vegetation removal (mechanical and pedestrian)	▪ Same as access road improvement, construction, and cleanup/site reclamation	▪ Same as access road improvement, construction, and cleanup/site reclamation

NOTE: [1]Any agent that causes stress to an organism or resource the organism depends on.

TABLE 3-99
TYPES OF INDIRECT EFFECTS ON GREATER SAGE-GROUSE

Project Activity/Phase	Stressor[1]	Potential Effects
Construction		
▪ Access road improvement and construction ▪ Vegetation clearing ▪ Road building (grading, cut and fill) ▪ Temporary access (drive and crush)	▪ Introduction of roads/cleared corridors on the landscape ▪ Introduction and spread of invasive, non-native plants and noxious weeds	▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds ▪ Increased predation risk to sage-grouse from mammalian predators ▪ Alteration of sage-grouse behavioral patterns due to increased predation pressure
▪ Construction site preparation ▪ Work site vegetation clearing and grading ▪ Multi-purpose yards/staging areas vegetation clearing ▪ Equipment mobilization and material staging	▪ Introduction of soil surface depressions other materials that could collect and/or retain water ▪ Introduction and spread of invasive, non-native plants and noxious weeds	▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds ▪ Increased predation risk to sage-grouse from mammalian predators ▪ Alteration of sage-grouse behavioral patterns due to increased predation pressure
▪ Construction of Project facilities ▪ Foundation excavation ▪ Tower assembly and erection ▪ Conductor, shield wire, and fiber optic ground wire stringing ▪ Series compensation station equipment installation ▪ Substation equipment installation	▪ Introduction of hunting perches (transmission line towers) for raptors and ravens ▪ Introduction and spread of invasive, non-native plants and noxious weeds	▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds ▪ Increased predation risk to sage-grouse from raptors and ravens ▪ Alteration of sage-grouse behavioral patterns due to increased predation pressure
▪ Cleanup and site reclamation ▪ Equipment, material, and trash removal ▪ Recontouring ▪ Site reclamation (topsoil spreading and seeding)	▪ Application of herbicides ▪ Introduction and spread of invasive, non-native plants and noxious weeds	▪ Reduction in sage-grouse forage, insect prey availability, and vegetation cover due to use of herbicides ▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds
Operation		
▪ Routine inspections ▪ Aerial inspections (helicopter) ▪ Ground inspections (vehicle and pedestrian)	▪ Introduction and spread of invasive, non-native plants and noxious weeds	▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds

TABLE 3-99
TYPES OF INDIRECT EFFECTS ON GREATER SAGE-GROUSE

Project Activity/Phase	Stressor[1]	Potential Effects
▪ Operation of transmission line, substations, and series compensation stations	▪ Increased human presence (public use) in previously vehicle inaccessible areas ▪ Introduction and spread of invasive, non-native plants and noxious weeds ▪ Presence of hunting perches (transmission line towers) for raptors and ravens ▪ Presence of roads/cleared corridors on the landscape	▪ Increased predation risk to sage-grouse by mammalian predators ▪ Increased predation risk to sage-grouse from raptors and ravens ▪ Potential sage-grouse avoidance of habitat due to potential increase in raptor predation pressure ▪ Alteration of sage-grouse behavioral patterns due to increased predation pressure ▪ Disruption of sage-grouse nesting and breeding activities and sage-grouse avoidance of habitat due to vehicle noise and human presence resulting from pubic use of new access routes ▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds
Maintenance		
▪ Access road maintenance	▪ Same as access road improvement and construction and cleanup/site reclamation	▪ Same as access road improvement and construction and cleanup/site reclamation
▪ Transmission line maintenance/equipment replacement	▪ Same as construction of Project facilities and cleanup/site reclamation	▪ Same as construction of Project facilities and cleanup/site reclamation
▪ Right-of-way vegetation maintenance ▪ Herbicide use ▪ Temporary access (drive and crush) ▪ Vegetation removal (mechanical and pedestrian)	▪ Same as access road improvement and construction and cleanup/site reclamation	▪ Same as access road improvement and construction and cleanup/site reclamation

NOTE: [1]Any agent that causes stress to an organism or resource the organism depends on.

TABLE 3-100 IMPACT FACTORS USED TO EVALUATE THE POTENTIAL DIRECT EFFECTS ON GREATER SAGE-GROUSE ASSOCIATED WITH THE PROJECT	
Factor	**Potential Direct Effects**
Direct loss of birds	▪ Moralities due to collisions with power line conductors, fences, or guy wires ▪ Mortality due to collisions with vehicles traveling on roads ▪ Mortalities due to destruction of active nests
Present or threatened destruction, modification, or curtailment of habitat or range	▪ Reductions in the quality of sage-grouse habitat by introducing and spreading of noxious weeds ▪ Loss and degradation of sage-grouse habitat quality and function ▪ Fragmentation of sage-grouse habitats (and avoidance of habitats by sage-grouse) due to the introduction of tall structures (transmission line towers), increased electromagnetic fields, and construction of new roads ▪ Disturbance to sage-grouse and disruption of breeding activities due to increased human presence and noise at lek locations ▪ Decreased nest initiation/success and lower population survival and growth rates resulting from disruption of seasonal movement, nesting, brooding, wintering, or breeding (lekking) activities ▪ Disturbance to sage-grouse during nesting, breeding, and wintering periods resulting from human presence, vehicle use, and noise during construction and maintenance ▪ Interruption and/or alternation of seasonal sage-grouse migrations and movements among populations
Overutilization (harvest)	▪ No direct effects that contribute to this factor were identified
Disease and predation	▪ Increased susceptibility of sage-grouse to disease and predation resulting from physiological stress induced by noise and human presence
Inadequacy of existing regulatory mechanisms	▪ No direct effects that contribute to this factor were identified
Other natural or man-made factors affecting the species' continued existence	▪ No direct effects that contribute to this factor were identified

Inadequacy of Existing Regulatory Mechanisms

The Project would not modify regulatory mechanisms designed to protect and promote conservation of sage-grouse and would be in compliance with all existing regulatory mechanisms. Additionally, the Project would be developed in compliance with all regulatory mechanisms currently under development by BLM, USFS, and affected states in response to the 12-month findings of the FWS on petitions to list the species under the ESA. If sage-grouse are listed as a threatened or endangered species under the ESA during the planning or development of the Project, BLM would comply with the provisions of the ESA through Section 7 consultation with the FWS. Inadequacy of existing regulatory mechanisms is not discussed further in this document.

Direct Loss of Sage-grouse

Potential direct effects of the Project that would contribute to the direct loss of birds from sage-grouse populations include:

- Mortality due to electrocution of sage-grouse from contact with power line infrastructure
- Morality due to collisions with power line conductors, fences, or guy wires
- Mortality due to collisions with vehicles traveling on roads
- Mortality due to destruction of active nests

Additionally, agency biologists and the scientific literature have identified electrocution of sage-grouse due to contact with power lines to be a potential effect on sage-grouse associated with power line development (76 FR 66370-66439). This effect is not anticipated to occur as a result of implementation of the Project and the rationale for this conclusion is presented in this section.

Mortality Due to Electrocution of Sage-grouse from Contact with the Power Line Infrastructure

Electrocution of birds and other wildlife by power lines have been observed due to animals' simultaneous contact with grounded and energized electrical equipment. Electrocution of birds can occur when the distance between phase conductors or the distance between grounded and energized hardware is less than the wrist-to-wrist or head-to-foot distance of a bird (APLIC 2006). There would be no potential for electrocution of sage-grouse due to contact with energized electrical infrastructure because the distance between conductors, or an energized conductor and a grounded element of the transmission line infrastructure, would be much greater than the wingspan or head-to-foot measurement of a greater sage-grouse.

Morality Due to Collisions with Power Line Conductors, Fences, or Guy Wires

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for sage-grouse mortality as a result of in-flight collisions with transmission lines or towers. Where guyed structures or construction of new fences are required in sage-grouse habitat, the potential for sage-grouse collisions with guy wires and fences would occur.

The potential for sage-grouse mortality due to collision with transmission line conductors, towers, and guy wires exists but is generally low. Factors influencing avian transmission line collisions include the location and configuration of transmission lines, species-specific tendencies for collision, and environmental conditions (e.g., weather, topography, and habitat) (APLIC 2006). Braun (Braun 1998) and Connelly et al. (Connelly et al. 2000) reported that sage-grouse mortalities as a result of collisions with transmission lines occur, but provided no specific data or cited studies (UDNR 2010). Unpublished reports of sage-grouse mortalities as a result of collisions with power lines were reported by Beck et al. (Beck et al. 2006) attributed two mortalities to power line collisions in southeastern Idaho accounted for 33 percent of observed juvenile (1st winter) mortality in low-elevation areas (UDNR 2010). It is unclear what evidence each of these authors used to draw the conclusion that mortalities were caused by collisions with transmission lines, and whether collisions reported occurred with transmission lines or distribution lines. Conductors on transmission lines are typically strung at higher elevations than distribution lines and have thicker conductors, which could increase birds' ability to see and avoid wires in flight. Information regarding typical sage-grouse flight heights is not available, though sage-grouse have been reported (anecdotally) to fly substantially higher when migrating between seasonal habitats than birds making short flights in seasonal habitats (S. Madsen 2012). The tendency of sage-grouse to fly relatively low, and in low light or when harried, may put them at a risk of collision with lines or guy wires. Areas where the transmission line would be located near habitats where grouse concentrate (e.g., leks, wintering areas, brood rearing areas) may represent localized areas where the risk of collision with the transmission line or guy wires would be increased.

Fences represent potential movement barriers (especially woven-wire fences), avian predator perches or travel corridors for mammalian predators, and are a potential cause of direct mortality to sage-grouse (Braun 1998). Fences with high collision risk generally include one or more of the following

characteristics: (1) constructed with steel t-posts, (2) constructed near leks, (3) bisect winter concentration areas, or (4) border riparian areas used for brood-rearing (Christiansen 2009). Sage-grouse collision risk during the breeding season is higher for fences located on flat ground close to larger leks (Stevens 2011; Stevens et al. 2012). Population-level effects of mortalities resulting from collisions with fences are unknown, but may be locally significant. However, the construction of fences will be limited to communication regeneration stations, ground rod installation sites, and substation perimeters in the form of chain link security fences (typically 8 feet in height, refer to Section 2.3) unlike the woven-wire big game fences (Braun 1998) more typically representing a potential movement barrier and collision threat to sage-grouse.

Mortality Due to Collisions with Vehicles Traveling on Roads

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for sage-grouse mortality as a result of collisions with construction and maintenance vehicles. Wildlife mortalities due to collisions with moving vehicles occur most frequently on well-traveled secondary roads and highways. The potential for wildlife collisions with vehicles on tertiary, unimproved, and one-lane roads is lower than on improved surface, larger roads as the frequency of travel is relatively low and vehicle speeds are limited by road conditions. To the extent possible, existing roads in their present condition without improvement would be used to access the right-of-way (Section 2.3.5). Where new roads are required to access the right-of-way, they would be constructed to a minimum width of 14 feet (Section 2.3.5). Existing roads in sage-grouse habitat likely to be used to access the Project during construction and maintenance are generally unimproved roads and are only suitable for low-speed vehicle travel (less than 30 mph). Access roads constructed for the Project would not be improved to a degree that vehicles traveling on these roads could reach high speeds. The Project would require construction of new access roads and increased traffic on existing access roads during construction and maintenance activities. Due to the limitation of construction and maintenance vehicle speeds due to access road conditions, the probability of sage-grouse mortality due to collisions with vehicles traveling on access roads was determined to be low. Additionally, a Traffic and Transportation Management Plan would be developed and incorporated into the POD to help reduce all potential environmental impacts related to transportation (Section 2.3.5).

Mortality Due to Destruction of Active Nests

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for sage-grouse mortality as a result of destruction of active nests. The potential for the destruction of active nests by construction vehicles is reduced due to seasonal restrictions on construction and maintenance activities would be implemented within 4 miles of sage-grouse leks to avoid impacts on nesting and breeding sage-grouse (Appendix E, Table E-10). Results of research projects in Colorado, Idaho, and Wyoming have indicated that approximately 80 percent of sage-grouse nests occur within 4 miles of the active lek where female grouse were captured and assumed to have bred (Colorado Greater Sage-grouse Steering Committee 2008). Sage-grouse that nest more than 4 miles away from known leks would not be protected by seasonal restrictions within 4 miles of leks. However, this suggests that 20 percent of the population nests are farther than 4 miles from a lek. Construction activities occurring during the sage-grouse nesting season would coincide with the migratory bird nesting season. Surveys for ground nesting migratory birds would be required within 7 days of ground-disturbing activities. While sage-grouse are not protected under the MBTA, if active sage-grouse nests are located during surveys for migratory ground nesting birds, BLM and the appropriate state wildlife agency would be notified before construction can proceed and appropriate spatial buffers will be implemented to avoid disturbing nesting activities. These protection measures should minimize direct impacts on nesting sage-grouse.

Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Potential direct effects of the Project that would contribute to the present or threatened destruction, modification, or curtailment of sage-grouse habitat or range include:

- Reduction in the quality of sage-grouse habitat due to introduction and spread of noxious weeds
- Loss and degradation of sage-grouse habitat quality and function
- Fragmentation of sage-grouse habitats (and avoidance of habitats by sage-grouse) due to the introduction of tall structures (transmission line towers), increased EMFs, and construction of new roads
- Disturbance to sage-grouse and disruption of breeding activities due to increased human presence and noise at lek locations
- Disturbance to sage-grouse during nesting, breeding, and wintering periods resulting from human presence, vehicle use, and noise during construction and maintenance
- Interruption and/or alternation of seasonal sage-grouse migrations and movements among populations

Reduction in the Quality of Sage-grouse Habitat by Introducing the Spread of Noxious Weeds

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for reductions in the quality of sage-grouse habitat by introducing and/or spreading noxious weeds. Presence of invasive plant species is a mechanism whereby any disturbance has the strong potential to result in suboptimal habitat quality (Crawford et al. 2004). Invasive plants, especially invasive annual grasses (e.g., cheatgrass) in sagebrush-steppe habitats, alter plant community structure and composition, productivity, nutrient cycling, and hydrology resulting in losses of biodiversity, ecosystem services, and soil properties and may competitively exclude the native plants important as cover and forage for sage-grouse (Mooney and Cleland 2001; Rowland et al. 2010; Vitousek 1990). The largest adverse consequence of exotic annual grass invasion on sage-grouse habitats is the resulting change in fire frequency and intensity. Ultimately, exotic grasses promote fires, and fires promote exotic grasses and facilitate the conversion of rangelands from perennial-dominated to annual-dominated systems by eliminating fire-intolerant species such as big sagebrush from these systems rendering them permanently unsuitable to sage-grouse (Davies et al. 2011; Mooney and Cleland 2001; Vitousek 1990).

The potential for the introduction and spread of noxious weeds would be reduced as a Noxious Weed Management Plan and a Reclamation, Revegetation, and Monitoring Plan would be developed and incorporated into the POD (Section 2.3.5). The Noxious Weed Management Plan would be developed in compliance with BLM Manual 9015 (Integrated Weed Management) and USFS Manual 2080 (Noxious Weeds) (Section 2.3.5) and would outline requirements for noxious weed inventory, monitoring, and reduction measures required to prevent spread of noxious weeds as a result of Project construction or maintenance. These measures will include washing of construction equipment prior to arriving onsite and treating and/or avoiding existing weed populations to avoid spreading weeds to uninfested areas. To support the implementation of the Noxious Weed Management Plan, a noxious weed inventory would be performed to identify locations where avoidance and treatment measures will be required. The results of surveys will be incorporated into the POD. Successful implementation of the Noxious Weed Management Plan will substantially reduce the probability of sage-grouse habitat degradation due to spread of noxious weeds. Implementation of the Reclamation, Revegetation, and Monitoring Plan would ensure that areas disturbed by Project construction are successfully reclaimed with a seed mix approved by the BLM and private landowners to further help prevent the spread of noxious weeds and restore function of disturbed habitats. However, noxious weeds aggressively invade disturbed areas and the potential for introducing or spreading noxious weeds would be present even if the Noxious Weed Management Plan and Reclamation, Revegetation, and Monitoring Plan were successfully implemented because of ground-disturbing activities associated with construction of the Project.

Loss and Degradation of Sage-grouse Habitat Quality and Function

Under any of the action alternatives, construction of the Project in sage-grouse habitat would result in loss and degradation of sage-grouse habitat quality and function. Removal of vegetation in sage-grouse nesting, brood-rearing, and wintering habitat as a result of construction of transmission line towers and access roads would result in loss and degradation of currently occupied sage-grouse habitat.

Direct loss of sage-grouse habitats as a result of project construction would be minimized through restoration of areas not required for ongoing operation and maintenance of the transmission line in accordance with the Reclamation, Revegetation, and Monitoring Framework Plan to be included as a part of the POD (Section 2.3.5). However, the footprint associated with infrastructure and roads would no longer function as effective sage-grouse habitat.

Fragmentation of Sage-grouse Habitats due to the Introduction of Tall Structures, Increased Electromagnetic Fields, and Construction of New Roads

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for fragmentation of habitats primarily as a result of potential avoidance by sage-grouse of habitats near the transmission line due to the introduction of tall structures, EMF, and new roads.

Sage-grouse biologists and agency personnel have raised concerns that sage-grouse may avoid areas that contain tall structures, including transmission line towers (Braun 1998; Braun et al. 2002; Pruett et al. 2009) and areas adjacent to transmission lines due to the presence of EMF near the line (Fernie and Reynolds 2005). Across the western range of the species, habitat suitability as measured by the presence of active leks was highest in areas with power line densities less than 0.037 miles (of overhead transmission line) per square mile (0.06 kilometers [of overhead transmission line]/square kilometer) and leks were absent from areas where power line densities exceeded 0.0124 miles (of overhead transmission line) per square mile (0.2 kilometers [of overhead transmission line]/square kilometer) (Knick et al. 2013). Displacement of greater sage-grouse from occupied habitats may occur as a result of construction of transmission line towers and the tendency of sage-grouse to avoid tall structures (transmission line towers), and in response to increased raptor presence as a result of the presence of transmission towers on which raptors perch. Braun (1998), citing unpublished data, reported that sage-grouse use of areas, near transmission lines in Colorado, as inferred from pellet counts, increased as distance from transmission line increased up to 1,968.5 feet (600 meters). Construction of a transmission line altered dispersal patterns of breeding sage-grouse in northeastern Utah (Ellis 1985), suggesting a transmission line could be a potential barrier to movements and thus result in habitat fragmentation. The transmission line was constructed within 656.17 feet (200 meters) of an active sage-grouse lek and was situated between the lek and male breeding season day use areas and resulted in a 72 percent decline in the mean number of displaying males and an alteration in daily dispersal patterns during the breeding season within 2 years of construction (Ellis 1985). The frequency of raptor-sage-grouse interactions during the breeding season increased 65 percent between pre- and post-transmission line comparisons (Ellis 1985). In northeastern Wyoming, the probability of lek persistence decreased with proximity to power lines and with increasing proportion of power lines within a 4-mile (6.4 kilometer) area around leks (Walker et al. 2007). Sage-grouse avoided brood-rearing habitats within 2.9 miles (4.7 kilometers) of transmission lines in south-central Wyoming (LeBeau 2012).

Sage-grouse populations rely on large, interconnected expanses of sagebrush and the majority of sage-grouse populations throughout the western range of the species are connected by landscapes characterized by moderate-to-high potential for sage-grouse movement (Knick et al. 2013; Wisdom et al. 2011). Lek persistence has been shown to be strongly related to lek connectivity, a measure of a lek's influence on the maintenance of range-wide population connectivity evaluated at a dispersal distance of 18 kilometers, with abandoned leks having lower range-wide connectivity importance (Knick and Hanser 2011). As

described previously, transmission lines could be a potential barrier to sage-grouse movements (Ellis 1985) and could limit dispersal between leks and populations which could compromise lek and population persistence.

Increased EMF has been shown to alter the behavior of avian species, though species vary in their sensitivity to this disturbance (Fernie and Reynolds 2005). Peer-reviewed studies regarding greater sage-grouse reactions to EMFs are not available. The potential effect of the proposed Project on EMF levels is described in Section 3.2.21. If sage-grouse avoid EMFs created by transmission lines, the effects are likely to be similar to those resulting from the introduction of transmission towers in occupied sage-grouse habitats.

Traffic on Project access roads will be greatest during construction of the transmission line, and in general, road effect-distances (the distance from a road at which a population density decrease is detected) are positively correlated with increased traffic density and speed (Forman and Alexander 1998). After completion of construction of the transmission line, Project- and non-project-related traffic on access roads developed for the project would likely be low and avoidance of sage-grouse habitats due to vehicle presence associated with access roads is expected to be minimal.

Disturbance to Sage-grouse and Disruption of Breeding Activities due to Increased Human Presence and Noise at Lek Locations

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for disturbance to sage-grouse and disruption of breeding activities due to increased human presence and other construction equipment at lek locations. Several studies have demonstrated that roads near sage-grouse leks may influence female habitat selection (Lyon and Anderson 2003) and that levels of road-related effects are positively correlated with increased traffic (Holloran 2005; Remington and Braun 1991). Sage-grouse have been shown to avoid nesting and summering near paved secondary highways in south-central Wyoming (LeBeau 2012). Traffic disturbance (1 to 12 vehicles/day) within 1.9 miles (3 kilometers) of leks during the breeding season reduced nest-initiation rates and increased distances moved from leks during nest site selection of female sage-grouse in southwestern Wyoming (Lyon and Anderson 2003). Rates of decline in male sage-grouse lek attendance increased as traffic volumes on roads within approximately 1.9 miles (3 kilometers) of leks increased, and vehicle activity on these roads during the daily strutting period (i.e., early morning) had a greater influence on male lek attendance compared to roads with no vehicle activity during early morning hours in southwestern Wyoming (Holloran 2005). In central Wyoming, peak male attendance (i.e., abundance) at leks experimentally treated with noise recorded at roads in a gas field, decreased 73 percent relative to paired controls. Blickley et al. suggest that the intermittent noise like that produced by traffic was a cause of declines in male lek attendance on leks near roads (Blickley et al. 2012). Impacts of anthropogenic activity have been documented at leks at a distance of up to 3.7 miles (6 kilometers) (Naugle et al. 2011). Implementation of seasonal restrictions within 4 miles of active leks would be expected to minimize disturbance associated with noise and human presence.

Minimal traffic disturbance (1 to 12 vehicles/day) within 1.86 miles (3 kilometers) of leks during the breeding season reduced nest-initiation rates and increased distances moved from leks during nest site selection of female sage-grouse; nesting propensity was 26 percent lower for females breeding on road-disturbed leks compared to undisturbed females, and females moved twice as far from leks to nest locations if breeding on disturbed leks (Lyon and Anderson 2003). Additionally, rates of decline in sage-grouse male lek attendance increased proportionally to traffic volumes on roads near leks (Holloran 2005). Therefore, even slight long-term increases in project and non-project-related traffic as a result of newly constructed roads has the potential to adversely influence sage-grouse distribution and reproduction throughout the life of the project.

Disturbance to Sage-grouse During Nesting, Breeding, and Wintering Periods Resulting from Human Presence, Vehicle Use, and Noise During Construction and Maintenance

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for disturbance to sage-grouse during wintering periods resulting from human presence, vehicle use, and noise during construction and maintenance of the Project.

In north central Wyoming, sage-grouse were 30 percent more likely to occupy sagebrush-dominated habitats with no gas field infrastructure compared to habitats with 12.3 wells/2.5 square miles (4 square kilometers) (i.e., maximum allowable well density on federal lands) during the winter (Doherty et al. 2008). In central Wyoming, sage-grouse at the scale of a home range avoided natural gas wells; at the scale of the population, avoidance of haul roads associated with natural gas development were observed during the winter (Dzialak et al. 2012). At a study site in southern Alberta, Canada, the probability of sage-grouse selection of winter habitat declined when these habitats were within 1,900 meters of oil or natural gas wells (Carpenter et al. 2010). Research in central Wyoming suggests that disturbance to wintering sage-grouse from energy development are related to human activity levels; variation in avoidance response to natural gas wells among sage-grouse individuals between day and night locations (e.g., avoidance of infrastructure during the day, but not at night) suggests avoidance of human activity (Dzialak et al. 2012). Based on study results, Braun suggests dissuading raptor perching on transmission line poles situated in suitable winter habitat (along windswept ridges and near large expanses of sagebrush that are not typically covered by snow in winter) to minimize the influence of avian predators perching on transmission lines on wintering sage-grouse populations(Braun 2006).

Interruption of Seasonal Sage-grouse Migrations and Movements Among Populations

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for interruption and/or alternation of seasonal sage-grouse migrations and movements among populations. As previously described, construction of transmission line structures and new access roads could result in sage-grouse avoiding areas near the transmission line such that those habitats are no longer used by sage-grouse, and could present a barrier to sage-grouse movements. If sage-grouse responses include avoidance of areas near the transmission line and/or reduction of movements across the transmission line right-of-way, the Project may fragment and reduce the connectivity of sage-grouse habitats in the Project area. These effects could result in alteration of seasonal sage-grouse migrations or movements among populations if habitats affected represent important seasonal habitat or habitat important for providing connectivity between populations. Gene flow in sage-grouse populations is likely limited to the movement of individuals between neighboring leks and populations and not likely the result of long-distance movements of individuals across large portions of the species' range (Oyler-McCance et al. 2005). Thus, regional connectivity among leks and populations may represent a fundamental source of genetic re-combination and metapopulation structure that supports the long-term viability of the species. Additionally, connectivity between leks has been shown to be important for population sustainablity (Knick and Hanser 2011; Knick et al. 2013). Studies have shown that sage-grouse that attend leks up to 11 miles from disturbances could be affected by the loss of seasonal habitat functionality (Nelle et al. 2000).

Disease and Predation

Potential direct effects of the Project that would contribute to increased susceptibility of sage-grouse to disease and predation resulting from physiological stress induced by noise and human presence.

For any of the action alternatives, construction of the Project in sage-grouse habitat could increase the susceptibility of sage-grouse to disease and predation as a result of physiological stress induced by noise and human presence during construction and maintenance of the Project.

Research in the natural gas fields of southwestern Wyoming suggested a lag between the times an individual sage-grouse was affected by an anthropogenic disturbance and when survival probabilities were adversely affected (Holloran 2005). Female sage-grouse were directly influenced by infrastructure and human activity primarily during the breeding and nesting seasons but differential survival between affected and control individuals occurred during the brooding and summer periods. The author suggested that declines in body condition caused by elevated blood corticosteroid levels—the physiological response of avian species to stress (Siegel 1980) during the period of time the females were influenced by energy development may have resulted in altered foraging or vigilance behaviors increasing the probability of predation later in the summer and early fall. Research data indicated impacts of infrastructure on female survival in general were the largest contributor to reduced population growth documented in sage-grouse populations influenced by energy development in southwestern Wyoming (Holloran 2005).

Poles and towers associated with transmission lines influence raptor and corvid distributions and hunting efficiency potentially resulting in increased predation on sage-grouse (Connelly et al. 2004; Steenhof et al. 1993). Foraging distances of avian predators of sage-grouse have been estimated at 4.3 miles (6.9 kilometers) (Knick and Connelly 2011), suggesting that transmission lines may influence sage-grouse survival at large spatial scales (Connelly et al. 2004; Cresswell et al. 2010). Although the conceptual effects of transmission lines on predator distributions and sage-grouse populations are clear-cut, direct information relating the effects of these lines on sage-grouse demographics is limited.

Other Natural or Man-made Factors Affecting the Species Continued Existence

Agency biologists identified the application of herbicides used for vegetation and noxious weed management as a potential action associated with power line development that could have adverse effects on sage-grouse health and populations. The affect is not anticipated to occur as a result of the implementation of the Project (Tables 3-98 and 3-100). There are not any additional direct effects identified from implementation of the Project that would contribute other natural or man-made factors affecting the continued existence of sage-grouse.

For any of the action alternatives, construction of the Project in sage-grouse habitat could increase the application of herbicides to control noxious weeds in sage-grouse habitat. Toxicity studies have concluded that herbicides applied at recommended rates should not result in sage-grouse poisonings (75 FR 13910). The effects of the Project on sage-grouse due to the application of herbicides would be limited as a Noxious Weed Management Plan would be developed and incorporated into the POD (Section 2.3.5). The Noxious Weed Management Plan would include restrictions on the use of herbicides intended for control of noxious weeds during Project construction, operation, maintenance, or reclamation monitoring. Herbicides would only be used for purposes of controlling noxious weeds, and would be used in their lowest effective concentrations. Herbicides would not be used in areas where sage-grouse are known to concentrate, for example, wet meadows or isolated mesic areas used by large numbers of sage-grouse during the summer.

Indirect Effects

Table 3-99 identifies the potential indirect impacts on sage-grouse of each Project activity and/or phase of the Project identified in the Applicant's Project Description (Refer to Section 2.3 and Appendix B).

Table 3-101 classifies each of the potential indirect effects on sage-grouse identified in Table 3-99 based on the five factor analysis and threats identified in the FWS 12-month findings on petitions to list greater sage-grouse under the ESA and the requirements of the Framework for Sage-grouse Impacts Analysis for the Project (Appendix F). The classification facilitates understanding of the Project's contribution to the threats to the species identified in the 12-month findings.

TABLE 3-101 IMPACT FACTORS USED TO EVALUATE THE POTENTIAL INDIRECT EFFECTS ON GREATER SAGE-GROUSE ASSOCIATED WITH THE PROJECT	
Factor	**Potential Indirect Effects**
Direct loss of birds	▪ No indirect effects that contribute to this factor were identified.
Present or threatened destruction, modification, or curtailment of habitat or range	▪ Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds ▪ Sage-grouse avoidance of habitat due to potential increase in raptor predation pressure ▪ Disruption of sage-grouse nesting and breeding activities and sage-grouse avoidance of habitat due to vehicle noise and human presence resulting from pubic use of new access
Overutilization (harvest)	▪ Increased public access to previously less accessible sage-grouse habitats
Disease and predation	▪ Increased predation risk to sage-grouse by mammalian predators ▪ Increased predation risk to sage-grouse by raptors and ravens ▪ Alteration of sage-grouse behavioral patterns due to increased predation pressure
Inadequacy of existing regulatory mechanisms	▪ No indirect effects that contribute to this factor were identified
Other natural or man-made factors affecting the species' continued existence	▪ Reduction in sage-grouse forage, prey availability, and vegetation cover due to use of herbicides

The effects of the Project related to each of the six factors included in Table 3-99 were evaluated based on the best available information regarding the development of the Project from the Applicant, scientific literature, and agency concerns regarding sage-grouse conservation. For each impact factor and/or associated potential indirect effect, the evaluation included an assessment of anticipated sage-grouse response and the severity of this response to the development of the Project.

Direct loss of birds and inadequacy of existing regulator mechanisms would not indirectly impact sage-grouse and are not included in the discussion that follows.

Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Potential indirect effects of the Project that would contribute to the present or threatened destruction, modification, or curtailment of sage-grouse habitat or range include:

- Alteration of the native sagebrush understory through introduction and spread of non-native, invasive plants and noxious weeds
- Sage-grouse avoidance of habitat due to potential increase in raptor predation pressure
- Disruption of sage-grouse nesting and breeding activities and sage-grouse avoidance of habitat due to vehicle noise and human presence resulting from pubic use of new access routes

Alteration of the Native Sagebrush Understory Through Introduction and Spread of Non-native, Invasive Plants and Noxious Weeds

For any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for introduction and spread of non-native plants and noxious weeds, most notably cheatgrass in sage-grouse habitats. Invasive plants and noxious weeds could be introduced or spread by vehicles and

equipment used during construction or by subsequent public use of access roads constructed for the Project. Cheatgrass has been a major factor in the loss of Wyoming big sagebrush communities (Chambers et al. 2007) and is consistently cited as a major challenge to the maintenance of sagebrush steppe habitats (Knick 1999; Young and Allen 1997). Invasive plants such as cheatgrass and medusahead displace desirable native plant species and degrade rangeland health. In many cases the displaced species are critical to sage-grouse survival (NRCS 2010). Degradation of sage-grouse habitat due to invasion of non-native plants and noxious weeds could lead to decreased survival of individual birds in affected populations and a reduction in the carrying capacity of sagebrush habitats.

In addition to cheatgrass' displacement of native understory species, infestation leads to an increased risk of wildfires that eliminate the sagebrush overstory because cheatgrass germinates early and thus dries early in the growing season (Klemmedson and Smith 1964). Sagebrush plant communities important for sage-grouse survival could be destroyed by fire and habitats require decades to recover. However, fires promote the proliferation of invasive annual grasses, and thus could result in the permanent conversion of sagebrush-dominated habitats to habitats of annual grasslands. Prior to re-establishment of sagebrush cover, these sites often have limited or no value to sage-grouse (Connelly et al. 2000). More frequent fires in sage-grouse habitats as a result of construction of the transmission line, access roads, and alteration of vegetation communities could result in reduced local sage-grouse population size and reduction of suitable habitat available for sage-grouse in the Project area.

The potential spread of invasive plants and noxious weeds as a result of ground disturbance during construction under all action alternatives would be minimized through the development of a Noxious Weed Management Plan to be included in the POD (Section 2.3.5). Measures that would be prescribed by the Noxious Weed Management Plan are described in more detail in the evaluation of direct effects.

Sage-grouse Avoidance of Habitat Due to Potential Increase in Raptor Predation Pressure

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for predation of sage-grouse by raptors and ravens in areas around the transmission line. The indirect effects of the Project on predation are described below under Disease and Predation. Sage-grouse may respond to increased predation pressure around the transmission line (Connelly et al. 2004) by avoiding areas where predators are concentrated and predation pressure is highest (Dinkins et al. 2012). If raptors and ravens are concentrated around the transmission line, sage-grouse may abandon or reduce their utilization of habitats near the transmission line, resulting in increased predation pressure on grouse in these areas effectively reducing the amount of habitat available to individuals and populations, and potentially displacing birds into suboptimal habitats (Connelly et al. 2004).

Disruption of Sage-grouse Nesting and Breeding Activities and Sage-grouse Avoidance of Habitat Due to Human Presence Resulting from Pubic Use of New Access Routes

New access routes constructed in sage-grouse habitat would be open and available for public use for recreational access or other uses of lands in the Project area following construction. The new access roads constructed for the Project would facilitate public use of sage-grouse habitats that are rarely visited by humans in their current condition due to their distance from developed roads. Increased vehicle noise and human presence due to public use of access roads would be expected to occur at low levels, as the Project predominately crosses sage-grouse habitat in rural areas where existing public utilization of access roads and public lands are generally low. Construction of the Project is not anticipated to create an attraction that would increase public visitation to the area following construction. Effects on sage-grouse and sage-grouse habitat use associated with vehicle noise and increased human presence resulting from pubic use of new access routes would be similar to the direct effects of construction on sage-grouse habitat use and nesting and breeding activities. However, the intensity of the effects on sage-grouse due to public use of

access roads could be less than the effects described for construction due to the anticipated infrequent public use of access roads.

Overutilization (Harvest)

Although no studies to date have demonstrated that hunting is a primary cause of sage-grouse population declines, hunting and harvest may influence grouse abundance and distributions through time and across landscape units (Reese and Connelly 2011; Sedinger et al. 2011). In some areas, harvest can have an additive effect on mortality, therefore local factors are important for determining harvest levels that balance the other stressors influencing a given population or region (Connelly et al. 2003a; Reese and Connelly 2011). However, due to constant reviews of controlled harvest levels by agencies, any local Project impacts on sage-grouse would not contribute to overutilization.

Disease and Predation

Potential indirect effects of the Project that would contribute to loss of sage-grouse due to disease and predation include:

- Increased potential for spread of disease among sage-grouse
- Increased predation risk to sage-grouse by mammalian predators
- Increased predation risk to sage-grouse by raptors and ravens
- Alteration of sage-grouse behavioral patterns due to increased predation pressure

Additionally, agency biologists and scientific literature have identified increased potential for spread of disease among sage-grouse to be a potential effect on sage-grouse associated with industrial development. This effect is not anticipated to occur as a result of implementation of the Project (Table 3-99) and the rationale for this conclusion is presented in this section.

Increased Potential for Spread of Disease among Sage-grouse

Sage-grouse are hosts for a variety of parasites and diseases (75 FR 13910). Many of these diseases (e.g., West Nile virus) could be spread by vectors including mosquitoes. Projects that create breeding habitat for mosquitoes through water development or other means could increase the spread of disease among sage-grouse. The Project would not require any water developments that could be used as suitable breeding reservoirs for disease vectors; thus, this issue is not addressed in this analysis.

Increased Predation Risk to Sage-grouse by Mammalian Predators

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for predation risk to sage-grouse due to an increase in mobility of mammalian predators along the transmission line corridor and increased detectability of sage-grouse to mammalian predators due to removal of sage-grouse escape cover. Improvement of old or construction of new access roads between tower locations would occur during Project construction. The Applicant has indicated that roads would be constructed in a straight line between towers to the extent practicable. Roads can provide corridors for mammalian predator movement which may result in increased sage-grouse predation (Kuipers 2003). Construction of straight roads between tower locations would also create long corridors where escape cover used by sage-grouse would be removed and visibility and mobility for mammalian predators could be increased. Sage-grouse may experience increased predation by mammalian predators due to the lack of escape cover and increased visibility of sage-grouse to mammalian predators when utilizing these corridors.

Increased Predation Risk to Sage-grouse by Raptors and Ravens

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the potential for predation of sage-grouse by raptors and ravens. Raptors and ravens are known to prey on nesting and foraging sage-grouse in addition to grouse on leks (Hagen 2011). Tall structures (including transmission line towers) provide attractive hunting perches for raptors and ravens in areas where vegetation is low and terrain is relatively flat (Connelly et al. 2000). Transmission line poles and towers have been shown to influence raptor and corvid distributions and hunting efficiency (Connelly et al. 2004; Steenhof et al. 1993), which may result in increased predation on sage-grouse. Knick and Connelly (2011) report estimated foraging distances of avian sage-grouse predators at 6.9 kilometers (4.3 miles), suggesting that the extent of habitat indirectly affected as a result of existing and planned transmission line infrastructure could be substantial (Connelly et al. 2004; Cresswell et al. 2010). Studies in Wyoming found leks in proximity to transmission lines have lower annual recruitment of individual birds when compared to leks farther from these lines. The difference was presumed to be a result of raptor predation (Braun et al. 2002).

Alteration of Sage-grouse Behavioral Patterns Due to Increased Predation Pressure

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase predation pressure on sage-grouse from avian and mammalian predators. Sage-grouse may respond to increased predation pressure by increasing sheltering behavior to avoid predation and reducing or shifting temporally other essential behaviors (e.g., foraging) (Hagen 2011). These behavioral shifts may reduce the fitness of individual sage-grouse that occupy habitats near the transmission line, which may ultimately influence survival (Holloran 2005).

Other Natural or Man-made Factors Affecting the Continued Existence of the Species

Potential indirect effects of the Project that would contribute to other natural or man-made factors affecting sage-grouse include reduction in sage-grouse forage, insect prey availability, and vegetation cover due to use of herbicides.

Reduction in Sage-grouse Forage, Insect Prey Availability, and Vegetation Cover Due to Use of Herbicides

Under any of the action alternatives, construction of the Project in sage-grouse habitat could increase the application of herbicides to control noxious weeds in sage-grouse habitat. Herbicide applications can kill sagebrush and forbs that are important food sources for sage-grouse (Call and Maser 1985), and may affect insect populations dependent on these plants. The use of herbicides to control noxious weeds have been shown to reduce the abundance and diversity of forbs in sage-grouse brood habitat (Crawford et al. 2004; Klebenow 1970). Reduction of understory vegetation in sagebrush habitats can reduce the amount of forbs and insects available, which comprise the bulk of sage-grouse chick diets until they are approximately 12 weeks of age (Klebenow and Gray 1968; Peterson 1970) and provide protein sources that are essential for successful egg production and chick nutrition (Gregg et al. 2008; Johnson and Boyce 1991; Schroeder et al. 1999). The effects of the Project on sage-grouse due to the application of herbicides would be limited as a noxious weed management plan would be developed and incorporated into the POD (Section 2.3.5). The noxious weed management plan would include restrictions on the use of herbicides intended for control of noxious weeds during Project construction, operation, maintenance, or reclamation monitoring. Herbicides would only be used for purposes of controlling noxious weeds, and would be used in their lowest effective concentrations. Herbicides would not be used in areas where sage-grouse are known to concentrate or in areas known to be important for nesting or brood-rearing females.

Mammals

Direct Effects

Potential direct effects of the Project on sensitive mammal species may include, habitat loss, degradation, and fragmentation, and injury, or mortality as described in Section 3.2.7. Potential indirect Project impacts on mammals may include loss of escape cover, foraging habitat, and habitats required for reproduction.

The pygmy rabbit is a sagebrush obligate species, which occurs in close association with stands of older growth big sagebrush (*Artemisia tridentata*). Pygmy rabbits occupy relatively small home ranges (approximately 2 miles maximum), and generally exhibit limited dispersal capabilities (Oliver 2004). Consequently, pygmy rabbits are susceptible to impacts resulting from modification or fragmentation of big sagebrush habitats (WGFD 2010c). Vegetation clearing and ground disturbance during project construction could result in habitat loss and fragmentation, and direct mortality of pygmy rabbits as a result of heavy equipment operations in occupied habitats.

The black-footed ferret occurs in close association with prairie dogs (*Cynomys* spp.) in grasslands, steppe, and shrub-steppe vegetation communities. Ground disturbance and heavy machinery operation during Project construction could result in direct mortality of prairie dogs (including the white-tailed prairie dog) and black-footed ferrets if prairie dog towns are not avoided. In some locations affected by project construction, clearing of shrub cover underlain by friable soils adjacent to existing prairie dog towns could result in prairie dog dispersal and localized increases in their abundance.

Indirect Effects

Potential indirect effects of the Project on sensitive mammal species include degradation of habitat quality as a result of weed infestations following project construction and associated increased potential for rangeland wildfire, increased predation by raptors, and increased disturbance and mortality associated with increased human access and activity to areas affected by project construction, as described in Section 3.2.7.

Pygmy rabbits, white-tailed prairie dogs, and black-footed ferrets could be subjected to increased raptor predation following construction of transmission towers which would provide perches for raptors in grassland, steppe, and shrub steppe habitats occupied by these sensitive mammal species. Additionally, increased predation of white-tailed prairie dogs by raptors may result in reduced availability of prey for black-footed ferrets which prey primarily on prairie dogs.

Other indirect effects of the Project on pygmy rabbits and prairie dogs may include changes in the distribution and availability of grasses and forbs selected as forage in areas affected by Project development. A potential for increased pygmy rabbit and prairie dog mortality resulting from vehicular traffic and hunting in areas affected by project development may also occur; as well as impacts on foraging success, energetic strategies, dispersal rates, population diversity, and abundance (Hanser et al. 2011).

Reptiles

Direct Effects

Direct effects on reptiles that may occur as a result of construction, operation, and maintenance of the Project include potential for reptile mortality and injury as well as loss of suitable refuge habitat. Loss of refuge habitat resulting from removal of vegetative cover and subsequent unique microclimates, and degradation of foraging and reproductive habitat for reptile species due to Project activities that may

affect the ability of reptiles to avoid predation, maintain current reproductive rates, and persist in the Project area are described in Section 3.2.7.

Indirect Effects

Indirect effects on reptiles that may occur as a result of construction, operation, and maintenance of the Project including changes to plant community composition, fire regimes, and habitat effectiveness and microclimate, through invasive weed species introduction, increase in human presence and noise levels are described in Section 3.2.7.

In addition to effects on reptiles described in Section 3.2.7, indirect effects of Project construction and maintenance on special status reptiles include potential weed introduction and alteration of native vegetation during ground-disturbing activities (vegetation clearing, construction of access roads, tower structures, and other Project features). Introduction of invasive plant species could affect the habitat effectiveness[3] of a given area, specifically in providing cover from avian and terrestrial predators or eliminate open 'inter-shrub' space required for movement and reduction in predator detection between refuges (Newbold 2005; Stebbins 2003; Vitt and Pianka 1994).

Mitigation Planning and Effectiveness

Design features of the Proposed Action and site-specific selective mitigation measures would be used under all alternative routes to reduce effects of the Project on special status wildlife. This section describes design features and selective mitigation measures that would be used to reduce effects on special status wildlife and describes why these measures should be effective at reducing adverse Project effects. If determined to be necessary under BLM, USFS, or other cooperating agency policy, additional mitigation measures would be developed and applied to reduce effects.

Design features effective at reducing potential adverse impacts on special status wildlife resources including features 3, 4, 6, 7, 8, 26, 27, 28, 30, and 39 are described in this section (presented in more detail in Table 3-102).

- **Design Feature 3 (management of special status species).** Special status species would be considered in accordance with management policies set forth by management agencies. Surveys for special status wildlife would be conducted in suitable habitat along the selected route using BLM-, USFS-, or other cooperating agency approved protocols. Impact avoidance and minimization measures would be applied to avoid adverse impacts on special status wildlife populations and habitat where identified, which may include altering the placement of roads or towers, as practicable. Monitoring of identified special status wildlife populations and habitat may also be required. This design feature will minimize adverse impacts on special status wildlife to the extent practicable through the identification of populations and habitats prior to construction and the creation of site-specific avoidance and mitigation plans.
- **Design Feature 4 (avian-safe design standards).** All new or rebuilt transmission facilities are constructed to avian-safe design standards (i.e., Suggested Practices for Avian Protection on Power Lines; The State of the Art in 2006 (APLIC 2006); Reducing Avian Collisions with Power Lines: The State of the Art in 2012 (APLIC 2012); PacifiCorp's Avian Protection Plan, updated June 2011 (PacifiCorp 2011). This design feature will limit the potential for avian wildlife collision, and reduce potential for avian injury and mortality to the extent practicable. Mortality from electrocution is unlikely as the distance between conductors and the distance between

[3]The degree to which a patch of habitat is able to support an animal or group of animals and how this ability is affected by human disturbance (Gaines et al. 2005).

energize conductors and grounded equipment is built to APLIC standards for high-voltage transmission lines (500kV and 345kV) and is greater than the wingspan of all avian species likely to occur in the Project area.

- **Design Feature 6 (seasonal restrictions for nesting migratory birds).** Construction and maintenance activities will avoid areas which are supporting actively nesting birds during the migratory bird nesting season, between February 1 and August 31; however, dates may vary depending on species, current environmental conditions, results of preconstruction surveys, and approval by agency biologists or agency-approved environmental inspectors. This design feature will restrict human activity to avoid disturbing migratory bird nests during species specific breeding seasons.
- **Design Feature 7 (breeding bird and nest surveys).** In the event that vegetation clearing and other construction and maintenance activities do not avoid the nesting season for migratory birds (between February 1 and August 31), surveys for active migratory bird nests would be performed and a spatial nest buffer would be placed around each active nest until such time as the status of the nest is determined through monitoring to be no longer occupied. Based on the best available scientific information, appropriate spatial nest buffers (by species or guild), and nest monitoring requirements would be identified through coordination with the FWS and other appropriate agencies and would be provided in a nest management plan in the POD. This design feature would minimize construction-related disturbance to avoid nesting migratory birds during the nesting season by determining active nest locations within 7 days of ground-disturbing activities and avoiding these areas.
- **Design Feature 8 (raptor protection restrictions).** FWS and BLM guidelines for raptor protection during the breeding season (Refer to Table E-7 in Appendix E) will be followed, including seasonal and spatial buffers around active nests, eagle roosts, and winter concentration areas. This design feature will limit Project-related spatial and temporal disturbance to raptors during sensitive life cycle periods to avoid human disturbance and increased noise levels in the vicinity of active nest sites and limit the potential for nest abandonment or a decrease in nest success. Exceptions to temporal and spatial buffer restrictions during Project construction could be granted if determined to be appropriate by a qualified biologist and approved by the BLM Authorized Officer and other cooperating agencies.
- **Design Feature 26 (vehicle access restriction).** All construction vehicle movement will be restricted to designated access roads based on avoidance of known noxious weed occurrences to the extent practicable. This design feature will minimize disturbance to special status wildlife habitat and populations by limiting vehicular access and would minimize the risk of noxious weed introduction and spread, as well as the potential for subsequent changes to natural wildfire regimes as a result of alterations in plant community composition that can increase the frequency and intensity of fire.
- **Design Feature 27 (construction activity access restriction).** All construction vehicle movement would be contained in a predetermined area. This design feature will minimize disturbance to special status wildlife and their habitat from construction activities and minimize risk of noxious weed introduction and the potential for subsequent changes to natural wildfire regimes as a result of alterations in plant community composition that can increase the frequency and intensity of fire.
- **Design Feature 28 (personnel instruction).** All Project personnel will be instructed in the importance, purpose, necessity, and Project-specific requirements for protection of natural resources. Instructions highlighting the importance of special status wildlife resources, federal and state laws and regulations that protect them and the appropriate protection measures for them. Instructions will also be given for reporting and stop work procedures in the event of a resource

conflict. This will minimize impacts on special status wildlife habitat and populations throughout the Project corridor; especially in occupied habitat for sensitive wildlife species that may not have been identified prior to the start of construction.

- **Design Feature 30 (hazardous materials restrictions).** Hazardous materials will be contained and removed to a disposal facility, and not drained into the ground, streams, or drainages. This design feature will minimize the potential for degradation of special status wildlife habitats due to Project activities by limiting the risk of introduction of contaminants into the environment that could adversely affect special status wildlife.
- **Design Feature 39 (vehicle speed limit for overland travel).** To minimize vehicle collisions with special status wildlife, a speed limit of 15 mph would be employed on overland access routes.

In addition, Selective Mitigation Measures 2, 4, 5, 6, 7, 11, 12, 13, 14, and 15 (Table 2-13) would be implemented to reduce potential high adverse impacts on certain federally listed special status wildlife species. These design features are described and the rationale for them is presented in this section.

- **Selective Mitigation Measure 2 (avoidance of sensitive resources).** No construction of new access roads will occur in sensitive resource areas (e.g., special status wildlife habitats). Existing roads will be used in these areas to the extent feasible. Through avoidance of clearing or construction of new access roads in sensitive resource areas, this mitigation measure will minimize habitat loss, degradation, and fragmentation, and reduce the risk of habitat fragmentation and consequent isolation of sub-populations, which can adversely impact the viability of special status wildlife populations.
- **Selective Mitigation Measure 4 (minimization of tree clearing).** Trees and other vegetation would be removed selectively (e.g., edge feathering), and trees more than 5 feet tall would be removed selectively in riparian and nesting habitats. Minimizing the number of trees cleared in sensitive habitats this mitigation measure would reduce impacts on timber resources, limit special status wildlife habitat fragmentation, and protect raptor nesting habitats to the extent feasible.
- **Selective Mitigation Measure 5 (minimization of new or improved Project accessibility).** All new or improved access not required for maintenance of the Project would be closed or rehabilitated following Project construction using the most effective and least environmentally damaging methods and habitat losses and fragmentation resulting from use of these roads during the construction period will be mitigated to the extent practicable. This measure would limit public access to special status wildlife populations and thereby reduce post-construction anthropogenic disturbance in these areas.
- **Selective Mitigation Measure 6 (tower design modification).** The type of transmission line tower structure used would be modified from a lattice steel structure to a tubular H-frame steel structure in areas where increased raptor and raven predation on special status wildlife (e.g., sage-grouse and white-tailed prairie dog/black-footed ferret) are a particular concern. This mitigation measure will reduce the number of perch sites on the transmission line structures available to raptors and ravens and increase the effectiveness of Selective Mitigation Measure 14 (perch deterrents and flight diverters) of reducing raptor and ravens use of the transmission line as a hunting perch. Used in conjunction with Selective Mitigation Measure 14, Selective Mitigation Measure 6 would reduce the effects of increased predation on special status wildlife.
- **Selective Mitigation Measure 7 (spanning or avoiding of sensitive features).** Project structures would be located to allow conductors to span or avoid identified sensitive features such as occupied habitats for special status wildlife species. This mitigation measure will avoid sensitive habitats to the extent practicable. By reducing impacts on sensitive habitats such as riparian areas

that some special status wildlife (e.g., southwestern willow flycatcher and yellow-billed cuckoo) are limited to and utilize as movement corridors, potential loss, degradation and fragmentation of habitat in the Project area would be reduced. By reducing the risk of habitat fragmentation and consequent isolation of sub-populations, which can adversely impact the viability of special status wildlife populations.

- **Selective Mitigation Measure 11 (minimization of right-of-way-clearing).** In special status wildlife occupied areas, the right-of-way width may be modified to protect wildlife. This mitigation measure will limit the amount of vegetation cleared from the right-of-way and minimize abruptness in changes in vegetation community composition between the right-of-way and adjacent habitat, which may minimize degradation of habitat quality; and reduce impacts on foraging and breeding behavior and movement potential of special status wildlife species.
- **Selective Mitigation Measure 12 (seasonal and spatial wildlife restrictions).** Construction and maintenance activities would be restricted in designated areas and during critical periods, (e.g., wintering habitats and specific breeding or nesting seasons). For sensitive wildlife species, this selective mitigation measure will minimize disturbance to special status wildlife by limiting human activity, noise and disturbance during sensitive life cycle periods, and reduce the risk of adverse impacts on breeding success and species survival rates.
- **Selective Mitigation Measure 13 (overland access).** Drive-and-crush (vehicular travel to access a site without significantly modifying the landscape) and/or clear-and-cut travel (removal of vegetation to provide suitable access for equipment) would occur in areas where no grading would be needed to access work areas. This would reduce the amount of ground-disturbing activities (e.g., surface soil removal, vegetation cropping/cutting) landscape modification, risk of introduction of invasive weeds, and special status wildlife habitat fragmentation. Modification of sagebrush vegetation communities, which provide necessary cover and forage for habitat suitability, resulting from vegetation clearing, will be limited to the extent practicable in habitats occupied by sagebrush obligate special status wildlife species like greater sage-grouse.
- **Selective Mitigation Measure 14 (perch deterrents and flight diverters).** Raptor perch deterrents would be installed on transmission line structures in areas where increased raptor and raven predation on special status wildlife is a concern. FWS field office approved raptor perch deterrents would be used in conjunction with Selective Mitigation Measure 6 (tower design modification). When used together, these mitigation measures would reduce the number of perch sites available on the transmission line structures and deter raptors and ravens from perching on the transmission line towers. These mitigation measures would reduce raptor and raven use of the transmission line structures as hunting perches and reduce the effects of increased predation on special status wildlife.

  Shield wires, guy wires, and overhead optical ground wire along portions of the transmission line that have a potential for avian collisions would be marked with flight diverters or other FWS field office, BLM- or USFS-approved devices in accordance with agency requirements and in compliance with recommendations made in the Avian Power Line Interaction Committee report, *Reducing Avian collisions with Power Lines: State of the Art in 2012* (APLIC 2012). Segments of the transmission line that would cross through, or are adjacent to, waterfowl and general migratory pathways or sensitive habitat for avian species may be identified in the future and marked to reduce the risk of avian collisions. The additional marking/placement of flight diverters or other agency approved devices along specific segments would be determined on consultation with the appropriate agencies. This design feature will minimize the risk of avian injury and mortality due to collision with Project features that would cross sensitive avian habitats in the Project area.

- **Selective Mitigation Measure 15 (limitation of access to sensitive habitats).** Where feasible, access roads that would cross sensitive habitats (e.g., special status WMAs) would be gated or otherwise blocked to limit public access. After construction, this mitigation measure would limit human access and activity, and disturbance of special status wildlife and their habitats during critical life cycle periods.

Table 3-102 lists key issues included in interdisciplinary comparison of alternative routes. Other special status wildlife resources would be inventoried and selective mitigation measures applied in accordance with applicable resource BLM, USFS, and other cooperating agency protection policies.

TABLE 3-102
SPECIAL STATUS WILDLIFE DESIGN FEATURES AND SELECTIVE MITIGATION MEASURES

Potential Special Status Wildlife Habitats	Relevant Design Feature	Selective Mitigation Measures Applied
Birds		
Southwestern willow flycatcher potential habitat	3, 6, 26, 27, 28, 30, 39	2, 4, 5, 7, 11, 12
Mexican spotted owl potential habitat	3, 4, 6, 8, 26, 27, 28, 30, 39	2, 4, 5, 7, 11, 12
Greater sage-grouse core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	5, 12, 13
Greater sage-grouse general habitat and transmission line corridors designated in Wyoming Executive Order 2011-5	3, 4, 6, 26, 27, 28, 30, 39	12
Greater sage-grouse habitat within 4 miles of leks in core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	5, 6, 12, 13, 14
Greater sage-grouse habitat within 4 miles of leks outside core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	5, 6, 12, 13, 14
Yellow-billed cuckoo potential habitat	3, 6, 7, 26, 27, 28, 30, 39	2, 4, 5, 7, 11, 12
Mountain plover potential habitat	3, 6, 7, 26, 27, 28, 39	12
Raptor nests and winter roosts	3, 7, 8, 39	4, 5, 12, 15
Mammals		
Black-footed ferret management areas	3, 26, 27, 28, 30, 39	5, 6, 14, 15
Pygmy rabbit potential habitat	3, 26, 27, 28, 30, 39	2, 5, 11
White-tailed prairie dog potential colonies	3, 26, 27, 28, 30, 39	7

Effects Analysis

Methods for Analysis to Support Interdisciplinary Comparison of Alternative Routes

The analysis of key issues raised by the public and agencies during scoping (Table 3-96) and considered in the interdisciplinary comparison of alternative routes, resulted in the development of criteria that were used to assess initial and residual impacts on special status wildlife. Analysis of potential impacts of the Project on other special status wildlife issues where comparable data were not available for all alternative routes did not include impact criteria. Methods used in the analysis of these issues are described under the Additional Analysis sections of potential effects for each alternative route by state.

Criteria for Assessing Level of Impacts

Criteria for assessing the level of potential Project impacts were developed in collaboration with the Agency Interdisciplinary Team for key wildlife issues included in the interdisciplinary comparison of alternative routes (Table 3-103). Impact criteria are based on considerations of a species legal status, regulatory protection, and susceptibility to temporary or permanent disturbances.

TABLE 3-103 SPECIAL STATUS WILDLIFE CRITERIA FOR ASSESSING LEVEL OF IMPACTS	
Level of Impacts	**Description**
High	▪ Impacts that would severely limit the long-term sustainability of populations (e.g., impacts on only known populations or to isolated populations vital to conservation efforts) ▪ Loss or adverse modification of large portions of occupied suitable habitat ▪ Loss or adverse modification of designated critical habitat
Moderate	▪ Impacts that would have adverse effects on species but would not severely limit the long-term sustainability of populations ▪ Loss or adverse modification of unoccupied suitable habitat
Low	▪ Impacts that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (e.g., indirect effects or impacts in areas of pre-existing disturbance) ▪ Indirect effects or disturbance in areas of pre-existing disturbance
Nonidentifiable	▪ Locations along the alternative route reference centerlines where none of the resources considered in the analysis of level of impacts on special status wildlife (black-footed ferret, white-tailed prairie dog, pygmy rabbit, mountain plover, Mexican spotted owl, southwestern willow flycatcher, yellow-billed cuckoo, and greater sage-grouse and associated special status habitats) occur

Initial Impacts

The criteria for assessing the level of a potential effect on special status wildlife resources (i.e., a particular species or habitat type) that could result from implementation of the Project is used as the basis for assessing initial and residual impacts. Design features of the Proposed Action (Table 3-102) would reduce impacts on special status wildlife resources and were considered when assessing potential impacts on special status wildlife resources. Based on the level of a potential effect on a special status wildlife resource, initial impacts were categorized (Table 3-104) based on the criteria descriptions presented in Table 3-103.

Residual Impacts

Residual impacts include those impacts on special status wildlife resources that are anticipated after the application of selective mitigation measures described in the Mitigation Planning and Effectiveness subsection of Section 3.2.8.4.3. The level of potential residual impacts on special status wildlife resources associated with implementation of the Project was assessed using the criteria presented in Table 3-103. Application of selective mitigation measures is expected to reduce the level of anticipated impacts. A summary of anticipated initial and residual impacts on special status wildlife resources, as well as the selective mitigation measures applied, are presented in Table 3-104.

TABLE 3-104 SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON SPECIAL STATUS WILDLIFE RESOURCES				
Biological Resource	**Design Features**	**Initial Impact[1]**	**Selective Mitigation Measure**	**Residual Impact[1, 2]**
Birds				
Potential southwestern willow flycatcher habitat	3, 6, 26, 27, 28, 30, 39	High	2, 4, 5, 7, 11, 12	Moderate
Potential Mexican spotted owl habitat	3, 4, 6, 8, 26, 27, 28, 30, 39	High	2, 4, 5, 7, 11, 12	Moderate

TABLE 3-104
SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON SPECIAL STATUS WILDLIFE RESOURCES

Biological Resource	Design Features	Initial Impact[1]	Selective Mitigation Measure	Residual Impact[1, 2]
Greater sage-grouse core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	High	5, 12, 13	High
Greater sage-grouse general habitat and transmission line corridors designated in Wyoming Executive Order 2011-5	3, 4, 6, 26, 27, 28, 30, 39	Low	12	Low
Greater sage-grouse habitat within 4 miles of leks in core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	High	5, 12, 13	High
Greater sage-grouse habitat within 4 miles of leks outside core areas or priority habitat	3, 4, 6, 26, 27, 28, 30, 39	Moderate	5, 12, 13	Moderate
Potential yellow-billed cuckoo habitat	3, 6, 7, 26, 27, 28, 30, 39	High	2, 4, 5, 7, 11, 12	Moderate
Potential mountain plover habitat	3, 6, 7, 26, 27, 28, 39	Moderate	12	Low
Mammals				
Black-footed ferret habitat	3, 4, 26, 27, 28, 30, 39	High	5, 15	High
Potential pygmy rabbit habitat	3, 4, 26, 27, 28, 30, 39	Moderate	2, 5, 11	Moderate
Potential white-tailed prairie dog colony	3, 4, 26, 27, 28, 30, 39	Moderate	7	Moderate

NOTES:
[1]Impact levels, including initial and residual impact levels, and the criteria for assessing level of impacts on each individual resource were developed in collaboration with and a consensus by the appropriate cooperating agencies, including the U.S. Fish and Wildlife Service and the Bureau of Land Management.
[2]Residual impact levels (low/moderate/high) may remain the same as initial impact levels, but the extent or amount of the resource affected would be reduced after selective application of appropriate selective mitigation measures.

Methods of Additional Analysis of Potential Impacts

The extent of loss of special status wildlife habitat (in acres) due to Project features was estimated to present a more explicit measure of impacts on special status wildlife resources. The total extent of disturbance (in acres) due to construction of features such as roads, transmission line towers, and other Project facilities was estimated over the entire length of an alternative route based on the access model developed for the Project and the Applicant's Project description (refer to Section 2.2.2). Disturbance associated with construction of the Project was assumed to occur at a constant density (acres) per mile and was calculated for each alternative route based on the total estimated disturbance and total length of each alternative route. The estimated density of disturbance (in acres per mile) for each alternative route was used to calculate the extent of effects on special status wildlife habitat (in acres) that could occur for each length of habitat crossed.

As the estimated density of disturbance per mile in the alternative route study corridors varies by alternative route, the centerline of the alternative routes that cross the same length of special status wildlife habitat may vary in estimated area of disturbance (in acres) to the habitat.

As comparable spatial data for some special status raptors and migratory birds are not available along all alternative routes, the best available spatial data were provided by the BLM and cooperating agencies for special status species likely to occur in the Project area. All spatial data collected and used in the analysis of potential effects are identified in Table 3-97. Results of additional known special status raptor and migratory bird habitats/nests located within 1 mile of the alternative routes are presented in Tables 3-109, 3-112, and 3-121.

To further evaluate the Project's potential effects on sage-grouse, the numbers of sage-grouse leks within 2, 4, and 11 miles of each alternative route were calculated. The percentage of each state's estimated sage-grouse population that attend leks located within 4 miles of each alternative route was estimated using the average peak male lek count data over the last five years, provided by the state wildlife agencies, to evaluate the relative importance of leks that could be affected by the Project to statewide sage-grouse populations. Lek counts are widely used to track trends in sage-grouse populations; however, concern regarding their usefulness has been expressed (Applegate 2000; Beck and Braun 1980; Walsh et al. 2004). Issues raised include (1) imprecise lek definitions, (2) the possibility that leks surveyed are not representative of the population, (3) inconsistency in following established lek count protocols across all or subsets of leks counted; and (4) inaccurate counts of the numbers of grouse using a lek (Johnson et al. 2011). However, lek counts are the most widely used method for tracking sage-grouse populations, and generally provide a reliable basis for inference regarding population trends at broader spatial scales (Connelly et al. 2003).

The average peak number of male sage-grouse observed on each lek in Wyoming, Colorado, and Utah during the most recent 5 years for which data were available was calculated (2008 to 2012 for Colorado and Wyoming, 2007 to 2011 for Utah). Not all leks were counted in all years and the average peak male counts were calculated based on the number of years each lek was counted during the 5-year period. The results were summed to provide an average peak number of male grouse counted in each state during the 5-year period. For each alternative route, the 5-year average peak male count for leks located within 4 miles of the alternative route was also summed and compared to the statewide average to estimate fraction of the statewide sage-grouse population that attend leks within 4 miles of the alternative route.

The same methods used to conduct these analyses on a statewide basis were used to analyze impacts on sage-grouse and sage-grouse habitat in the seven geographically separate sage-grouse populations crossed by the alternative routes in Utah. Sage-grouse habitat in northwestern Colorado and south-central Wyoming is contiguous (refer to MV 12) and distinct population boundaries are not recognized by the BLM or state wildlife agencies. Therefore, additional individual population-level analyses beyond the statewide analyses described previously were not warranted in Colorado and Wyoming.

3.2.8.5 Results

Similar types of impacts on special status wildlife resources associated with the construction, operation, and maintenance of the Project would be anticipated for all action alternatives. Differences in the magnitude and extent of impacts anticipated among individual alternative routes are driven by the type and quantity of special status wildlife resources present along each alternative routes and the degree that potential effects can be mitigated or avoided.

3.2.8.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.8.5.2 Impacts Common to All Action Alternatives

In addition to the species discussed in detail in this section, all special status wildlife species identified in Table E-8 and described in Appendix E, Section E.5 could be present along all of the alternative routes and could be affected by the Project along the selected route. However, there are no quantitative results common to all action alternatives. Individual species' ranges are described in Appendix E, Section E.5, and types of potential effects that may occur are described in Section 3.2.8.4.

3.2.8.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary transmission line components would be located in the area between the Mona and Clover substations west of the town of Mona, Utah. Most of the 345kV ancillary transmission line components would be in an existing right-of-way. The components would not affect habitat for any of the special status wildlife species analyzed in detail, as none occurs in this area. However, special status wildlife species identified in Table E-8 and described in Appendix E, Section E.5 could be present along all 345kV ancillary components and could be affected by construction of these facilities. The types of potential effects that may occur are described in Section 3.2.8.4.

3.2.8.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Environmental Setting

The four WYCO alternative routes are located in the southern Wyoming Basin and northern Colorado Plateau ecoregions and cross Sweetwater and Carbon counties in Wyoming and Moffat and Routt counties in Colorado. Climate along the WYCO alternative routes is classified as cold desert, with warm to hot summers with low humidity, and cool to cold dry winters. Habitats in this portion of the Project area are dominated by arid shrub/shrub-steppe and big sagebrush. Pinyon-juniper woodlands and perennial grasslands are located east of Dinosaur National Monument; and aspen and mountain shrub woodlands are found west of the Routt National Forest in Colorado. Areas affected by previous human activities are concentrated near the cities of Hanna, Rawlins, and Sinclair in Wyoming and Craig in Colorado (MV-10a, MV-11a, and MV-12a).

All of the WYCO alternative routes begin at the Aeolus Substation near Medicine Bow, Wyoming, and end along U.S. Highway 40 in Colorado. A description of the types of vegetation communities crossed by the WYCO alternative routes and their existing condition is included in Section 3.2.7 for the WYCO alternative routes.

Special status wildlife species known to occur or that may occur in the vegetation communities crossed by the WYCO alternative routes include black-footed ferret, greater sage-grouse, pygmy rabbit, Mexican spotted owl, white-tailed prairie dog, yellow-billed cuckoo, mountain plover, and other species (including but not limited to kit fox and burrowing owl) described in Appendix E, Section E.5. Southern Wyoming and northwestern Colorado contain some of the highest sage-grouse population densities rangewide (Doherty et al. 2010) and the WYCO alternative routes cross designated (Table 3-97) sage-grouse core areas, priority habitats, and habitats within 4 miles of sage-grouse leks.

Black-footed ferrets may occur in the Shirley Basin (Wyoming) and Wolf Creek (Colorado) reintroduction management areas. However, all black-footed ferret observations in the Shirley Basin reintroduction management area have occurred in grassland habitats north and east of the Project area; reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012); and the likelihood of ferrets being located in these areas is believed to be very low.

Pygmy rabbits are common in sagebrush habitats in southern Wyoming and likely to occur throughout the Project area in Carbon and Sweetwater counties (EPG 2013). Pygmy rabbits were observed only recently in Colorado and may occur in sagebrush habitats crossed by the Project in Moffat County (Beauvais 2011).

Mexican spotted owls are not known to occur in southern Wyoming and are extremely uncommon in northwestern Colorado. Mexican spotted owls have been occasionally detected in Dinosaur National Monument (FWS 2011h), and may use deep canyon habitats in other areas of northwestern Colorado as well.

White-tailed prairie dogs are locally common in southern Wyoming and northwestern Colorado, though plague, management as a pest species, and habitat loss has limited the species distribution and population size.

Yellow-billed cuckoos may occur in the limited riparian habitats supported by major rivers and perennial and intermittent streams throughout the Project area.

Mountain plovers are known to use disturbed, grassland, and shrubland habitats (Knopf and Miller 1994) in Wyoming and Colorado and can be locally abundant during the breeding season (Smith and Keinath 2004).

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

In many areas, Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2 and WYCO-B-3 in Wyoming are located adjacent to existing disturbances including existing oil and gas development, interstate highways, transmission lines, and unpaved roads in some areas of Wyoming. However, in several areas, Alternative WYCO-B and route variations cross habitats that have been largely unaffected by previous anthropogenic development between the Aeolus Substation and I-80, where the alternative route would be located in the transmission corridor designated by Wyoming Executive Order 2011-5, and in the vicinity of Flat Top Mountain between I-80 and the Wyoming/Colorado state line. The dominant vegetation communities crossed by Alternative WYCO-B are big sagebrush and shrub/shrub-steppe, with smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian areas (Section 3.2.5).

The extent of potential habitat for special status wildlife species that would be crossed by each WYCO alternative route is presented in Table 3-105.

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-B in Wyoming are presented in Table 3-106. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

TABLE 3-105
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
Alternative WYCO-B and Route Variations												
WYCO-B (Applicant Preferred Alternative)	204.5	19.7	17.7	96.5	51.0	0.0	0.0	0.0	27.3	177.5	52.0	55.1
Wyoming	*138.1*	*7.9*	*7.3*	*77.1*	*41.2*	*0.0*	*0.0*	*0.0*	*0.0*	*140.7*	*18.5*	*55.1*
Colorado	*66.4*	*11.8*	*10.4*	*19.4*	*9.8*	*0.0*	*0.0*	*0.0*	*27.3*	*36.8*	*33.5*	*0.0*
WYCO-B-1	204.9	19.7	15.9	97.6	50.3	0.0	0.0	0.1	27.5	177.7	52.2	55.1
Wyoming	*138.1*	*7.9*	*7.3*	*77.1*	*41.2*	*0.0*	*0.0*	*0.0*	*0.0*	*140.7*	*18.5*	*55.1*
Colorado	*66.8*	*11.8*	*8.6*	*20.5*	*9.1*	*0.0*	*0.0*	*0.1*	*27.5*	*37.0*	*33.7*	*0.0*
WYCO-B-2 (Agency Preferred Alternative)	204.5	19.7	16.4	96.5	50.7	0.0	0.0	0.0	28.6	176.2	51.8	55.1
Wyoming	*138.1*	*7.9*	*7.3*	*77.1*	*41.2*	*0.0*	*0.0*	*0.0*	*0.0*	*140.7*	*18.5*	*55.1*
Colorado	*66.4*	*11.8*	*9.1*	*19.4*	*9.5*	*0.0*	*0.0*	*0.0*	*28.6*	*35.5*	*33.3*	*0.0*
WYCO-B-3	204.5	19.7	17.4	96.5	50.8	0.0	0.0	0.0	27.5	177.3	50.9	55.1
Wyoming	*138.1*	*7.9*	*7.3*	*77.1*	*41.2*	*0.0*	*0.0*	*0.0*	*0.0*	*140.7*	*18.5*	*55.1*
Colorado	*66.4*	*11.8*	*10.1*	*19.4*	*9.6*	*0.0*	*0.0*	*0.0*	*27.5*	*36.6*	*32.4*	*0.0*
Alternative WYCO-C and Route Variations												
WYCO-C	210.4	19.7	19.2	95.2	59.8	0.0	0.0	0.0	27.3	183.4	52.0	62.5
Wyoming	*144.0*	*7.9*	*8.8*	*75.8*	*50.0*	*0.0*	*0.0*	*0.0*	*0.0*	*146.6*	*18.5*	*62.5*
Colorado	*66.4*	*11.8*	*10.4*	*19.4*	*9.8*	*0.0*	*0.0*	*0.0*	*27.3*	*36.8*	*33.5*	*0.0*
WYCO-C-1	210.8	19.7	17.4	96.3	59.1	0.0	0.0	0.1	27.5	183.6	52.2	62.5
Wyoming	*144.0*	*7.9*	*8.8*	*75.8*	*50.0*	*0.0*	*0.0*	*0.0*	*0.0*	*146.6*	*18.5*	*62.5*
Colorado	*66.8*	*11.8*	*8.6*	*20.5*	*9.1*	*0.0*	*0.0*	*0.1*	*27.5*	*37.0*	*33.7*	*0.0*
WYCO-C-2	210.4	19.7	17.9	95.2	59.5	0.0	0.0	0.0	28.6	182.1	51.8	62.5
Wyoming	*144.0*	*7.9*	*8.8*	*75.8*	*50.0*	*0.0*	*0.0*	*0.0*	*0.0*	*146.6*	*18.5*	*62.5*
Colorado	*66.4*	*11.8*	*9.1*	*19.4*	*9.5*	*0.0*	*0.0*	*0.0*	*28.6*	*35.5*	*33.3*	*0.0*

TABLE 3-105
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
WYCO-C-3	210.4	19.7	18.9	95.2	59.6	0.0	0.0	0.0	27.5	183.2	50.9	62.5
Wyoming	*144.0*	*7.9*	*8.8*	*75.8*	*50.0*	*0.0*	*0.0*	*0.0*	*0.0*	*146.6*	*18.5*	*62.5*
Colorado	*66.4*	*11.8*	*10.1*	*19.4*	*9.6*	*0.0*	*0.0*	*0.0*	*27.5*	*36.6*	*32.4*	*0.0*
Alternative WYCO-D and Route Variation												
WYCO-D	250.0	21.9	15.0	100.4	36.3	1.2	0.0	0.8	88.8	177.2	110.6	81.4
Wyoming	*135.0*	*10.1*	*6.0*	*93.8*	*27.3*	*0.0*	*0.0*	*0.0*	*18.1*	*137.7*	*43.4*	*74.1*
Colorado	*115.0*	*11.8*	*9.0*	*6.6*	*9.0*	*1.2*	*0.0*	*0.8*	*70.7*	*39.5*	*67.2*	*7.3*
WYCO-D-1	250.0	21.9	14.7	100.4	36.1	1.2	0.0	0.8	89.0	177.0	109.5	81.4
Wyoming	*135.0*	*10.1*	*6.0*	*93.8*	*27.3*	*0.0*	*0.0*	*0.0*	*18.1*	*137.7*	*43.4*	*74.1*
Colorado	*115.0*	*11.8*	*8.7*	*6.6*	*8.8*	*1.2*	*0.0*	*0.8*	*70.9*	*39.3*	*66.1*	*7.3*
Alternative WYCO-F and Route Variations												
WYCO-F	218.9	19.7	17.7	115.1	64.0	0.0	0.0	0.0	27.3	191.9	52.0	75.5
Wyoming	*152.5*	*7.9*	*7.3*	*95.7*	*54.2*	*0.0*	*0.0*	*0.0*	*0.0*	*155.1*	*18.5*	*75.5*
Colorado	*66.4*	*11.8*	*10.4*	*19.4*	*9.8*	*0.0*	*0.0*	*0.0*	*27.3*	*36.8*	*33.5*	*0.0*
WYCO-F-1	219.3	19.7	15.9	116.2	63.3	0.0	0.0	0.1	27.5	192.1	52.2	75.5
Wyoming	*152.5*	*7.9*	*7.3*	*95.7*	*54.2*	*0.0*	*0.0*	*0.0*	*0.0*	*155.1*	*18.5*	*75.5*
Colorado	*66.8*	*11.8*	*8.6*	*20.5*	*9.1*	*0.0*	*0.0*	*0.1*	*27.5*	*37.0*	*33.7*	*0.0*
WYCO-F-2	218.9	19.7	16.4	115.1	63.7	0.0	0.0	0.0	28.6	190.6	51.8	75.5
Wyoming	*152.5*	*7.9*	*7.3*	*95.7*	*54.2*	*0.0*	*0.0*	*0.0*	*0.0*	*155.1*	*18.5*	*75.5*
Colorado	*66.4*	*11.8*	*9.1*	*19.4*	*9.5*	*0.0*	*0.0*	*0.0*	*28.6*	*35.5*	*33.3*	*0*
WYCO-F-3	218.9	19.7	17.4	115.1	63.8	0.0	0.0	0.0	27.5	191.7	50.9	75.5
Wyoming	*152.5*	*7.9*	*7.3*	*95.7*	*54.2*	*0.0*	*0.0*	*0.0*	*0.0*	*155.1*	*18.5*	*75.5*
Colorado	*66.4*	*11.8*	*10.1*	*19.4*	*9.6*	*0.0*	*0.0*	*0.0*	*27.5*	*36.6*	*32.4*	*0.0*

NOTES:
[1]Each of the special status mammals and birds will not add to the total miles column due to overlapping habitats.
[2]Designated in Wyoming Executive Order 2011-5
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources represented in the table are listed for each special status wildlife resource in Table 3-97.

TABLE 3-106
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route[1]	Columbian Sharp-Tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
	Number of Known Leks within 4 Miles of Centerline	Acres of Winter Habitat	Number of Known Nests within 1 Mile of Centerline	Number of Known Winter Roost Sites Crossed	Number of Known Nests within 0.5 Mile of Centerline	Acres of Post-fledging Areas	Number of Known Post-fledging areas within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Acres of nesting Areas	Number of Known Nests within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Number of Nests within 0.25 Mile
Alternative WYCO-B and Route Variations												
WYCO-B (Applicant Preferred Alternative)	0	0	2	1	0	0	0	10	0	20	139	0
Wyoming	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*10*	*0*	*20*	*139*	*0*
Colorado	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-B-1	–	–	2	1	–	–	–	10	–	20	139	–
Wyoming	*–*	*–*	*1*	*0*	*–*	*–*	*–*	*10*	*–*	*20*	*139*	*–*
Colorado	*–*	*–*	*1*	*1*	*–*	*–*	*–*	*–*	*–*	*–*	*–*	*–*
WYCO-B-2 (Agency Preferred Alternative)	–	–	2	1	–	–	–	10	–	20	–	–
Wyoming	*–*	*–*	*1*	*0*	*–*	*–*	*–*	*10*	*–*	*20*	*–*	*–*
Colorado	*–*	*–*	*1*	*1*	*–*	*–*	*–*	*–*	*–*	*–*	*–*	*–*
WYCO-B-3	–	–	2	1	–	–	–	10	–	20	–	–
Wyoming	*–*	*–*	*1*	*0*	*–*	*–*	*–*	*10*	*–*	*20*	*–*	*–*
Colorado	*–*	*–*	*1*	*1*	*–*	*–*	*–*	*–*	*–*	*–*	*–*	*–*
Alternative WYCO-C and Route Variations												
WYCO-C	0	0	2	1	0	0	0	31	0	24	139	0
Wyoming	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*31*	*0*	*24*	*139*	*0*
Colorado	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-C-1	–	–	2	1	–	–	–	31	–	24	139	–
Wyoming	*–*	*–*	*1*	*0*	*–*	*–*	*–*	*31*	*–*	*24*	*139*	*–*
Colorado	*–*	*–*	*1*	*1*	*–*	*–*	*–*	*–*	*–*	*–*	*–*	*–*
WYCO-C-2	–	–	2	1	–	–	–	31	–	24	139	–
Wyoming	*–*	*–*	*1*	*0*	*–*	*–*	*–*	*31*	*–*	*24*	*139*	*–*
Colorado	*–*	*–*	*1*	*1*	*–*	*–*	*–*	*–*	*–*	*–*	*–*	*–*

TABLE 3-106
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

	Columbian Sharp-Tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
Alternative Route[1]	**Number of Known Leks within 4 Miles of Centerline**	**Acres of Winter Habitat**	**Number of Known Nests within 1 Mile of Centerline**	**Number of Known Winter Roost Sites Crossed**	**Number of Known Nests within 0.5 Mile of Centerline**	**Acres of Post-fledging Areas**	**Number of Known Post-fledging areas within 0.5 Mile of Centerline**	**Number of Known Nests within 1 Mile of Centerline**	**Acres of nesting Areas**	**Number of Known Nests within 0.5 Mile of Centerline**	**Number of Known Nests within 1 Mile of Centerline**	**Number of Nests within 0.25 Mile**
WYCO-C-3	–	–	2	1	–	–	–	31	–	24	139	–
Wyoming	–	–	*1*	*0*	–	–	–	*31*	–	*24*	*139*	–
Colorado	–	–	*1*	*1*	–	–	–	–	–	–	–	–
Alternative WYCO-D and Route Variation												
WYCO-D	48	564	4	6	0	0	0	13	0	23	200	1
Wyoming	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*13*	*0*	*23*	*200*	*1*
Colorado	*48*	*564*	*3*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-D-1	48	–	4	6	–	–	–	13	–	23	200	1
Wyoming	–	–	*1*	*0*	–	–	–	*13*	–	*23*	*200*	*1*
Colorado	*48*	–	*3*	*6*	–	–	–	–	–	–	–	–
Alternative WYCO-F and Route Variations												
WYCO-F	0	0	2	1	0	0	0	12	0	21	135	0
Wyoming	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*12*	*0*	*21*	*135*	*0*
Colorado	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
WYCO-F-1	–	–	2	1	–	–	–	12	–	21	135	–
Wyoming	–	–	*1*	*0*	–	–	–	*12*	–	*21*	*135*	–
Colorado	–	–	*1*	*1*	–	–	–	–	–	–	–	–
WYCO-F-2	–	–	2	1	–	–	–	12	–	21	135	–
Wyoming	–	–	*1*	*0*	–	–	–	*12*	–	*21*	*135*	–
Colorado	–	–	*1*	*1*	–	–	–		–	–	–	–
WYCO-F-3	–	–	2	1	–	–	–	12	–	21	135	–
Wyoming	–	–	*1*	*0*	–	–	–	*12*	–	*21*	*135*	–
Colorado	–	–	*1*	*1*	–	–	–	–	–	–	–	–

NOTES:
[1]Comprehensive raptor nest survey data are not currently available for all alternative routes but preconstruction surveys will be conducted along the selected alternative route and seasonal and spatial restrictions on construction and maintenance (Selective Mitigation Measure 12) would be applied to all known nests.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). Zeros reported in the table do not represent absence data and dashes (-) appear where data were not available. The specific data sources represented in the table are listed for each special status wildlife resource in Table 3-97.

If selected, Alternative WYCO-B could require construction in buffer areas around active raptor nests closed to construction activities year-round by a controlled surface-use (CSU) stipulation in the BLM Rawlins Field Office RMP requiring a year-round 825-foot spatial buffer for active raptor nests (1,200 feet for ferruginous hawk nests). However, exceptions to the BLM-determined buffer distances can be granted depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. Proposed projects that could adversely affect raptors in the Rawlins Field Office boundaries are evaluated on a case by case basis by BLM resource specialists (BLM 2008i).

Potential yellow-billed cuckoo habitat is crossed by Alternative WYCO-B along the Coal Gulch stream corridor between I-80 and the Wyoming/Colorado state line (MV-11a). The Coal Gulch stream corridor is located in an area that has been affected by past and present oil and gas development, which may have decreased the quality of potential yellow-billed cuckoo habitats in this area.

Potential mountain plover habitat occurs throughout the majority of the length of Alternative WYCO-B and route variations in Wyoming (MV-11a).

Special Status Upland Game Birds

In Wyoming, Alternative WYCO-B crosses sage-grouse core areas and habitats within 4 miles of leks both inside and outside core areas (Table 3-105, MV-12a). Where crossing greater sage-grouse core areas and priority habitats, this alternative would be located within a transmission line corridor designated by Wyoming Executive Order 2011-5 or parallel to an existing high-voltage transmission line. Sage-grouse population areas crossed by Alternative WYCO-B in Wyoming are described below. The extent of sage-grouse habitat crossed by Alternative WYCO-B is presented in Table 3-105. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

TABLE 3-107
SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ALTERNATIVE ROUTE CENTERLINES FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Number of Sage-grouse Leks		
	Within 2 Miles	Within 4 Miles	Within 11 Miles
Alternative WYCO-B and Route Variations			
WYCO-B (Applicant Preferred Alternative)	23	51	184
Wyoming	*17*	*40*	*148*
Colorado	*6*	*11*	*36*
WYCO-B-1	23	51	186
Wyoming	*17*	*40*	*148*
Colorado	*6*	*11*	*38*
WYCO-B-2 (Agency Preferred Alternative)	23	50	184
Wyoming	*17*	*40*	*148*
Colorado	*6*	*10*	*36*
WYCO-B-3	23	50	184
Wyoming	*17*	*40*	*148*
Colorado	*6*	*10*	*36*

TABLE 3-107
SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ALTERNATIVE ROUTE CENTERLINES FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Number of Sage-grouse Leks		
	Within 2 Miles	Within 4 Miles	Within 11 Miles
Alternative WYCO-C and Route Variations			
WYCO-C	25	50	179
Wyoming	*19*	*39*	*143*
Colorado	*6*	*11*	*36*
WYCO-C-1	25	50	181
Wyoming	*19*	*39*	*143*
Colorado	*6*	*11*	*38*
WYCO-C-2	25	49	179
Wyoming	*19*	*39*	*143*
Colorado	*6*	*10*	*36*
WYCO-C-3	25	49	179
Wyoming	*19*	*39*	*143*
Colorado	*6*	*10*	*36*
Alternative WYCO-D and Route Variation			
WYCO-D	33	79	252
Wyoming	*24*	*51*	*176*
Colorado	*9*	*28*	*76*
WYCO-D-1	33	78	252
Wyoming	*24*	*51*	*176*
Colorado	*9*	*27*	*76*
Alternative WYCO-F and Route Variations			
WYCO-F	29	57	201
Wyoming	*23*	*46*	*165*
Colorado	*6*	*11*	*36*
WYCO-F-1	29	57	203
Wyoming	*23*	*46*	*165*
Colorado	*6*	*11*	*38*
WYCO-F-2	29	56	201
Wyoming	*23*	*46*	*165*
Colorado	*6*	*10*	*36*
WYCO-F-3	29	56	201
Wyoming	*23*	*46*	*165*
Colorado	*6*	*10*	*36*

NOTES:
Lek analysis incudes only leks in contiguous sage-grouse habitat crossed by each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources represented in the table are listed for each special status wildlife resource in Table 3-97.

Wyoming Sage-grouse Population Areas Crossed by Alternative WYCO-B and Route Variations

Bates Hole/Shirley Basin

The Bates Hole/Shirley Basin sage-grouse population is a large population that occupies fairly contiguous habitat throughout much of Bates Hole and the Shirley Basin (Bates Hole/Shirley Basin Working Group [BHSBWG] 2007). The area occupied by the Bate Hole/Shirley Basin sage-grouse populations includes areas identified as core sage-grouse habitat by Wyoming Executive Order 2012-005 and other occupied habitats in the Shirley Basin, Rattlesnake Hills, southern Bighorn Mountains, Laramie Range, and isolated habitats in southern Niobrara and Platte counties.

As of Spring 2006, there were 230 known occupied leks associated with the Bates Hole/Shirley Basin sage-grouse population (BHSBWG 2007). The Bates Hole/Shirley Basin designated occupied sage-grouse habitats occur in Carbon, Albany, Converse, Laramie, Natrona, Niobrara, and Platte counties. Habitats supporting the Bates Hole/Shirley Basin sage-grouse population are organized in seven different management areas (BHSBWG 2007) contained in the greater Management Zone II: Wyoming Basin identified in the *Greater Sage-grouse Conservation Objectives Final Report* (FWS 2013; Stiver et al. 2006).

Habitats associated with the Bates Hole/Shirley Basin conservation area include sagebrush/grassland, salt desert shrub, mixed mountain shrub, grasslands, mixed forests (conifers and aspen), agricultural crops, riparian corridors, and urban areas. Designated occupied sage-grouse habitats occur primarily in sagebrush/grassland areas of Bates Hole, Shirley Basin, the Rattlesnake Hills, the south end of the Bighorn Mountains, the foothills of the Laramie Range and northern Platte County/southern Niobrara County. Occupied sage-grouse habitats are fragmented by topography and interspersed with curl-leaf mountain mahogany communities in the Rattlesnake Hills and the south end of the Big Horn Mountains (BHSBWG 2007).

Weather (e.g., drought) and vegetation management (e.g., livestock grazing and invasive plant management) are considered to be influential factors for the Bates Hole/Shirley Basin sage-grouse populations (BHSBWG 2007). Oil and gas development, coal mining, wind energy complexes, livestock grazing, dry-land and irrigated crop production, and residential and commercial expansion projects located in and around the sage-grouse habitats occupied by the Bates Hole/Shirley Basin population have directly and indirectly affected sage-grouse and their associated habitats.

Overall male sage-grouse lek attendance has increased between 1996 and 2006 in the Bates Hole/Shirley Basin population (BHSBWG 2006), which represents a large portion of the Wyoming Basin population. Given the large size of the Wyoming portion of the greater Wyoming Basin population, the increasing population trend, and the presence of large contiguous habitats, the Bates Hole/Shirley Basin population has been designated as a low risk population by the FWS (FWS 2013).

South Central Wyoming

The conservation area associated with the large South Central Wyoming sage-grouse population includes the Platte Valley, Laramie Plains, Great Divide Basin, North Ferris, south Sweetwater, and Little Snake river Valley in Carbon, Sweetwater, Albany, Fremont, and Natrona counties of southern Wyoming (South Central Sage-grouse Local Working Group [SCLWG] 2007).

As of 2006, there were 296 occupied leks associated with the South Central Wyoming sage-grouse population (SCLWG 2007). Habitats associated with the South Central Wyoming conservation area include shortgrass prairie, sagebrush/grassland, salt desert shrub, mixed mountain shrub, mixed forest types, agricultural, and urban types. Designated occupied sage-grouse habitats occur primarily in sagebrush/grassland areas of the Great Divide Basin, Little Snake River Valley, southwest Laramie Plains, and Platte Valley (SCLWG 2007). Habitats supporting the South Central Wyoming sage-grouse population are organized in five different management areas (SCLWG 2007), which are contained in the greater Management Zone II: Wyoming Basin identified in the *Greater Sage-grouse Conservation Objectives Final Report* (FWS 2013). Occupied sage-grouse habitats are fragmented by transportation corridors including I-80, Union Pacific Railroad, and Wyoming Highways 70, 789, 287, and 230/130 as well as development around urban areas including Rawlins, Laramie, Saratoga, Encampment, Baggs, and Wamsutter.

Weather (e.g., drought), livestock grazing, and vegetation management (e.g., invasive plant management) are considered to be the most influential limiting factors for the South Central Wyoming sage-grouse

populations (SCLWG 2007). Livestock grazing practices along with conflicting wildlife and feral horse management, predation, energy development, livestock grazing, and invasive plants are all influential potential limiting factors to the South Central Wyoming sage-grouse population as well. Mineral exploration, transmission line and wind energy development, coal mining, oil and gas development, and urban expansion projects located in and around the sage-grouse habitats occupied by the South Central Wyoming population have directly and indirectly affected sage-grouse and their associated habitats.

Overall male sage-grouse lek attendance has increased between 1996 and 2000 in the South Central Wyoming population with a more dramatic increase between 2004 and 2006 (SCLWG 2007), which represents a large portion of the Wyoming Basin population. Given the large size of the Wyoming portion of the greater Wyoming Basin population, the increasing population trend, and the presence of large contiguous habitats, the South Central population has been designated as a low risk population by the FWS (FWS 2013).

Mammals

Alternative WYCO-B in Wyoming crosses the western portion of the Shirley Basin black-footed ferret reintroduction management area (MV-10a). Habitats in this area currently support low densities of white-tailed prairie dogs, and it is unlikely that black-footed ferrets occupy this part of the reintroduction management area.

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-B and its route variations in Wyoming. Concentrations of potential colonies are crossed by Alternative WYCO-B between I-80 and the Wyoming/Colorado state line along Coal Gulch and in the southeast corner of Sweetwater County (MV-10a). Colonies along Coal Gulch have been affected by previous oil and gas development; however, potential habitats in southeastern Sweetwater County have been largely unaffected by previous anthropogenic development.

Alternative WYCO-B crosses pygmy rabbit potential habitat along the majority of the alternative route in Wyoming (MV-10a), including vegetation communities that have, and some that have not, been affected by previous anthropogenic development.

Environmental Consequences (Wyoming)

Alternative WYCO-B

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative WYCO-B in Wyoming and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of the selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Wyoming under Alternative WYCO-B would be similar to the other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Wyoming, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Shirley Basin reintroduction management area) as well as sage-grouse core areas and habitats within 4 miles of leks located in core areas. The quantity of high residual impacts would be the same for Alternatives WYCO-B, WYCO-C, and WYCO-F (Table 3-108). Alternative WYCO-B has the least moderate residual impacts on special status wildlife resources in the WYCO grouping, and a comparable amount of low impact to Alternatives WYCO-C and WYCO-F in Wyoming (Table 3-108).

TABLE 3-108
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE RESOURCES RESIDUAL IMPACTS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts (miles) [1, 2]			
		Nonidentifiable[3]	Low	Moderate	High
Alternative WYCO-B and Route Variations					
WYCO-B (Applicant Preferred Alternative)	204.5	2.3	34.5	104.5	63.2
Wyoming	*138.1*	*0.0*	*24.8*	*89.0*	*24.3*
Colorado	*66.4*	*2.3*	*9.7*	*15.5*	*38.9*
WYCO-B-1	204.9	2.3	34.6	104.6	63.4
Wyoming	*138.1*	*0.0*	*24.8*	*89.0*	*24.3*
Colorado	*66.8*	*2.3*	*9.8*	*15.6*	*39.1*
WYCO-B-2 (Agency Preferred Alternative)	204.5	2.3	35.3	103.3	63.6
Wyoming	*138.1*	*0.0*	*24.8*	*89.0*	*24.3*
Colorado	*66.4*	*2.3*	*10.5*	*14.3*	*39.3*
WYCO-B-3	204.5	2.3	35.5	104.2	62.5
Wyoming	*138.1*	*0.0*	*24.8*	*89.0*	*24.3*
Colorado	*66.4*	*2.3*	*10.7*	*15.2*	*38.2*
Alternative WYCO-C and Route Variations					
WYCO-C	210.4	2.3	37.6	107.3	63.2
Wyoming	*144.0*	*0.0*	*27.9*	*91.8*	*24.3*
Colorado	*66.4*	*2.3*	*9.7*	*15.5*	*38.9*
WYCO-C-1	210.8	2.3	37.7	107.4	63.4
Wyoming	*144.0*	*0.0*	*27.9*	*91.8*	*24.3*
Colorado	*66.8*	*2.3*	*9.8*	*15.6*	*39.1*
WYCO-C-2	210.4	2.3	38.4	106.1	63.6
Wyoming	*144.0*	*0.0*	*27.9*	*91.8*	*24.3*
Colorado	*66.4*	*2.3*	*10.5*	*14.3*	*39.3*
WYCO-C-3	210.4	2.3	38.6	107.0	62.5
Wyoming	*144.0*	*0.0*	*27.9*	*91.8*	*24.3*
Colorado	*66.4*	*2.3*	*10.7*	*15.2*	*38.2*
Alternative WYCO-D and Route Variation					
WYCO-D	250.0	4.0	31.1	89.5	125.4
Wyoming	*135.0*	*0.0*	*7.2*	*82.4*	*45.4*
Colorado	*115.0*	*4.0*	*23.9*	*7.1*	*80.0*
WYCO-D-1	250.0	4.0	32.1	89.2	124.7
Wyoming	*135.0*	*0.0*	*7.2*	*82.4*	*45.4*
Colorado	*115.0*	*4.0*	*24.9*	*6.8*	*79.3*
Alternative WYCO-F and Route Variations					
WYCO-F	218.9	2.3	30.1	123.3	63.2
Wyoming	*152.5*	*0.0*	*20.4*	*107.8*	*24.3*
Colorado	*66.4*	*2.3*	*9.7*	*15.5*	*38.9*
WYCO-F-1	219.3	2.3	30.2	123.4	63.4
Wyoming	*152.5*	*0.0*	*20.4*	*107.8*	*24.3*
Colorado	*66.8*	*2.3*	*9.8*	*15.6*	*39.1*
WYCO-F-2	218.9	2.3	30.9	122.1	63.6
Wyoming	*152.5*	*0.0*	*20.4*	*107.8*	*24.3*
Colorado	*66.4*	*2.3*	*10.5*	*14.3*	*39.3*
WYCO-F-3	218.9	2.3	31.1	123.0	62.5
Wyoming	*152.5*	*0.0*	*20.4*	*107.8*	*24.3*
Colorado	*66.4*	*2.3*	*10.7*	*15.2*	*38.2*

NOTES:
[1]Where multiple special status wildlife resources are crossed, the resource with the highest impact-level assignment was reported.
[2]Includes impacts on black-footed ferret, white-tailed prairie dog, pygmy rabbit, mountain plover, Mexican spotted owl, southwestern willow flycatcher, yellow-billed cuckoo, and greater sage-grouse and associated special status habitats.
[3] Miles are along the reference centerlines where none of the modeled habitats listed in the previous note occur.

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project and seasonal restrictions on construction and maintenance activities would be implemented in accordance with agency policies and plans (Selective Mitigation Measure 12). Alternative WYCO-B in Wyoming is located within 1 mile of known raptor nests (Table 3-106). A CSU stipulation in the BLM Rawlins Field Office RMP prohibits construction of structures requiring repeated human presence within 825 feet of active raptors nests (1,200 feet for ferruginous hawks) unless current nest activity, natural topographic barriers, and line-of-sight distances suggest exceptions to buffer distances could be approved without unacceptable impacts on nesting activity. Projects that could adversely affect raptors in the BLM Rawlins Field Office are evaluated on a case-by-case basis by BLM resource specialists (BLM 2008b). Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.4.

If exceptions to CSU stipulations identified in the BLM Rawlins Field Office RMP were granted, BLM would require additional mitigation measures to reduce and monitor potential effects on raptors nesting in CSU areas such as 5 years of annual nest monitoring post construction, marking of optical ground wire on the transmission line (Selective Mitigation Measure 14) in the CSU area, closing access roads in the CSU area after construction (Selective Mitigation Measure 15), or other measures implemented in accordance with agency requirements in the event that monitoring detects a Project-related impact on nesting activities. After mitigation, impacts associated with the Project would not be anticipated to cause a decline in raptor populations in the Project area in Wyoming.

Some loss of riparian vegetation along Coal Gulch that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance selective mitigation measures. If yellow-billed cuckoos use riparian habitats along Coal Gulch, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along Coal Gulch. Alternative WYCO-B would result in a loss of more potential yellow-billed cuckoo habitat than Alternative WYCO-C but less than Alternative WYCO-F and considerably less than Alternative WYCO-D in Wyoming (Table 3-109).

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-B in Wyoming, and despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative WYCO-B would result in modification of more potential mountain plover habitat than Alternative WYCO-D but considerably less than Alternatives WYCO-C and WYCO-F in Wyoming (Table 3-109).

TABLE 3-109
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
Alternative WYCO-B and Route Variations											
WYCO-B (Applicant Preferred Alternative)	321	289	1,574	832	0	0	0	445	2,896	848	899
Wyoming	*129*	*119*	*1,258*	*672*	*0*	*0*	*0*	*0*	*2,296*	*302*	*899*
Colorado	*192*	*170*	*316*	*160*	*0*	*0*	*0*	*445*	*600*	*547*	*0*
WYCO-B-1	320	258	1,586	817	0	0	2	447	2,887	848	895
Wyoming	*128*	*119*	*1,253*	*669*	*0*	*0*	*0*	*0.0*	*2,286*	*301*	*895*
Colorado	*192*	*140*	*333*	*148*	*0*	*0*	*2*	*447*	*601*	*547*	*0*
WYCO-B-2 (Agency Preferred Alternative)	320	267	1,569	824	0	0	0	465	2,865	842	896
Wyoming	*128*	*119*	*1,254*	*670*	*0*	*0*	*0*	*0*	*2,288*	*301*	*896*
Colorado	*192*	*148*	*315*	*154*	*0*	*0*	*0*	*465*	*577*	*541*	*0*
WYCO-B-3	321	284	1,573	828	0	0	0	448	2,891	830	898
Wyoming	*129*	*119*	*1,257*	*672*	*0*	*0*	*0*	*0*	*2,294*	*302*	*898*
Colorado	*192*	*165*	*316*	*156*	*0*	*0*	*0*	*448*	*597*	*528*	*0*
Alternative WYCO-C and Route Variations											
WYCO-C	319	311	1,543	969	0	0	0	442	2,972	843	1,013
Wyoming	*128*	*143*	*1,229*	*810*	*0*	*0*	*0*	*0*	*2,376*	*300*	*1,013*
Colorado	*191*	*169*	*314*	*159*	*0*	*0*	*0*	*442*	*596*	*543*	*0*
WYCO-C-1	318	281	1,554	954	0	0	2	444	2,963	842	1,008
Wyoming	*128*	*142*	*1,223*	*807*	*0*	*0.*	*0*	*0*	*2,366*	*298*	*1,008*
Colorado	*190*	*139*	*331*	*147*	*0*	*0*	*2*	*444*	*597*	*544*	*0*
WYCO-C-2	319	289	1,537	961	0	0	0	462	2,940	837	1,009
Wyoming	*128*	*142*	*1,224*	*808*	*0*	*0*	*0*	*0*	*2,367*	*299*	*1,009*
Colorado	*191*	*147*	*313*	*153*	*0*	*0*	*0*	*462*	*573*	*538*	*0*

TABLE 3-109
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
WYCO-C-3	319	306	1,541	965	0	0	0	445	2,966	824	1,012
Wyoming	*128*	*142*	*1,227*	*810*	*0*	*0*	*0*	*0*	*2,374*	*300*	*1,012*
Colorado	*191*	*164*	*314*	*155*	*0*	*0*	*0*	*445*	*592*	*525*	*0*
Alternative WYCO-D and Route Variation											
WYCO-D	350	240	1,604	580	19	0	13	1,419	2,831	1,767	1,301
Wyoming	*161*	*96*	*1,499*	*436*	*0*	*0*	*0*	*289*	*2,200*	*693*	*1,184*
Colorado	*189*	*144*	*105*	*144*	*19*	*0*	*13*	*1,130*	*631*	*1.074*	*117*
WYCO-D-1	351	235	1,607	578	19	0	13	1,425	2,833	1,753	1,303
Wyoming	*162*	*96*	*1,501*	*437*	*0*	*0*	*0*	*290*	*2,204*	*695*	*1,186*
Colorado	*189*	*139*	*106*	*141*	*19*	*0*	*13*	*1,135*	*629*	*1,058*	*117*
Alternative WYCO-F and Route Variations											
WYCO-F	318	286	1,857	1,033	0	0	0	440	3,097	839	1,218
Wyoming	*128*	*118*	*1,544*	*875*	*0*	*0*	*0*	*0*	*2,503*	*299*	*1,218*
Colorado	*190*	*168*	*313*	*158*	*0*	*0*	*0*	*440*	*594*	*541*	*0*
WYCO-F-1	317	256	1,867	1,017	0	0	2	442	3,087	839	1,213
Wyoming	*127*	*117*	*1,538*	*871*	*0*	*0*	*0*	*0*	*2,492*	*297*	*1,213*
Colorado	*190*	*138*	*329*	*146*	*0*	*0*	*2*	*442*	*595*	*542*	*0*
WYCO-F-2	317	264	1,851	1,025	0	0	0	460	3,066	833	1,214
Wyoming	*127*	*117*	*1,539*	*872*	*0*	*0*	*0*	*0*	*2,495*	*298*	*1,214*
Colorado	*190*	*146*	*312*	*153*	*0*	*0*	*0*	*460*	*571*	*536*	*0*
WYCO-F-3	319	281	1,856	1,029	0	0	0	443	3,091	821	1,217
Wyoming	*128*	*118*	*1,543*	*874*	*0*	*0*	*0*	*0*	*2,501*	*298*	*1,217*
Colorado	*191*	*163*	*313*	*155*	*0*	*0*	*0*	*443*	*590*	*522*	*0*

NOTES:
[1]Designated in Wyoming Executive Order 2011-5
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative WYCO-B in Wyoming would occur in transmission corridors designated by Wyoming Executive Order 2011-005 or in areas where this alternative route is parallel to an existing high-voltage transmission line or other linear disturbances that have degraded the existing quality of sage-grouse habitats (e.g., I-80). Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure also would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse core areas, as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Wyoming by Alternative WYCO-B is presented in Table 3-109.

Alternative WYCO-B crosses between the I-80 corridor to the Wyoming/Colorado state line, through sage-grouse habitat in an area that has been largely unaffected by previous anthropogenic development. The alternative route is outside of designated core areas in this area but crosses within 4 miles of sage-grouse leks. The methods used to establish core area boundaries in Wyoming considered sage-grouse lek attendance and leks in core areas constitute a large percentage of the statewide sage-grouse population in Wyoming (Doherty et al. 2011). The leks influenced by this alternative route generally have low sage-grouse attendance and presumably have relatively lower importance for maintaining statewide sage-grouse populations than leks with higher attendance and leks located with a core area. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative WYCO-B during the past 5 years, and the percentage of the average Wyoming statewide sage-grouse male lek counts that this represents, are presented in Table 3-110.

TABLE 3-110
SUMMARY OF 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF REFERENCE CENTERLINES FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	5-Year Average Sage-grouse Lek Counts[1]		
	Statewide Sum	Sum within 4 miles	Percentage of Leks within 4 miles
Alternative WYCO-B and Route Variations			
WYCO-B (Applicant Preferred Alternative)			
Wyoming	*26,646*	*413*	*2*
Colorado	*3,077*	*136*	*4*
WYCO-B-1			
Wyoming	*26,646*	*413*	*2*
Colorado	*3,077*	*136*	*4*
WYCO-B-2 (Agency Preferred Alternative)			
Wyoming	*26,646*	*413*	*2*
Colorado	*3,077*	*134*	*4*
WYCO-B-3			
Wyoming	*26,646*	*413*	*2*
Colorado	*3,077*	*134*	*4*
Alternative WYCO-C and Route Variations			
WYCO-C			
Wyoming	*26,646*	*409*	*2*
Colorado	*3,077*	*136*	*4*
WYCO-C-1			
Wyoming	*26,646*	*409*	*2*
Colorado	*3,077*	*136*	*4*

TABLE 3-110
SUMMARY OF 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF REFERENCE CENTERLINES FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	5-Year Average Sage-grouse Lek Counts[1]		
	Statewide Sum	Sum within 4 miles	Percentage of Leks within 4 miles
WYCO-C-2			
Wyoming	*26,646*	*409*	*2*
Colorado	*3,077*	*134*	*4*
WYCO-C-3			
Wyoming	*26,646*	*409*	*2*
Colorado	*3,077*	*134*	*4*
Alternative WYCO-D and Route Variation			
WYCO-D			
Wyoming	*26,646*	*504*	*2*
Colorado	*3,077*	*327*	*11*
WYCO-D-1			
Wyoming	*26,646*	*504*	*2*
Colorado	*3,077*	*325*	*11*
Alternative WYCO-F and Route Variations			
WYCO-F			
Wyoming	*26,646*	*488*	*2*
Colorado	*3,077*	*136*	*4*
WYCO-F-1			
Wyoming	*26,646*	*488*	*2*
Colorado	*3,077*	*136*	*4*
WYCO-F-2			
Wyoming	*26,646*	*488*	*2*
Colorado	*3,077*	*134*	*4*
WYCO-F-3			
Wyoming	*26,646*	*488*	*2*
Colorado	*3,077*	*134*	*4*

NOTES:
[1]Not all leks have been counted each year during the past 5 years and lek counts may have been conducted using different methodologies in different states. For leks without data for the past 5 consecutive years, an average of the number of counts available during the period was used. The counts do not sum for each alternative route as they are state specific.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Mammals

Alternative WYCO-B crosses the southwestern edge of the Shirley Basin black-footed ferret management area (MV-10a). Habitats crossed in the management area are rugged terrain and only support low densities of prairie dog towns at this time, which are an essential component of black-footed ferret habitat. Due to the disperse nature of prairie dog towns, the area in the Shirley Basin black-footed ferret management area potentially affected by Alternative WYCO-B is unlikely to support black-footed ferret. Alternatives WYCO-B, WYCO-C, and WYCO-F would affect the same extent of the Shirley Basin black-footed ferret management area (Table 3-105) and comparably more than Alternative WYCO-D in Wyoming.

Potentially suitable white-tailed prairie dog colony and pygmy rabbit habitats are present along the majority of all the WYCO alternative routes throughout Wyoming. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the

Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4.

The magnitude of effects of Alternative WYCO-B on white-tailed prairie dog potential colonies and pygmy rabbit habitat could be less, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-B crosses the same extent of potential white-tailed prairie dog potential colonies as Alternative WYCO-F, more than Alternative WYCO-C and less than Alternative WYCO-D in Wyoming. Alternative WYCO-B in Wyoming crosses the same extent of potential pygmy rabbit habitat as Alternative WYCO-C and considerably less than Alternatives WYCO-D and WYCO-F (Table 3-109).

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

The environmental consequences for Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Wyoming are the same as Alternative WYCO-B as they follow the same alignment (Table 3-109).

Affected Environment (Colorado)

Alternative WYCO-B and its route variations in Colorado cross vegetation communities that have been largely unaffected by previous anthropogenic development between the Wyoming/Colorado state line and U.S. Highway 40. The alternative route is parallel to existing infrastructure including a high-voltage 345kV transmission line and U.S. Highway 40. The dominant vegetation communities crossed by Alternative WYCO-B are big sagebrush and shrub/shrub-steppe with smaller areas of barren/sparsely vegetated, developed/disturbed, grassland, pinyon-juniper, riparian, and agricultural habitats (Section 3.2.5).

Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 are located in Colorado in the Sevenmile Ridge and Tuttle Ranch Conservation Easement areas. In Moffat County, Route Variation WYCO-B-2 is located north of U.S. Highway 40 to bypass the Tuttle Ranch Conservation Easement. In contrast, Route Variation WYCO-B-3 is located south of U.S. Highway 40, and colocated with an existing 345kV transmission line through the Tuttle Ranch Conservation Easement. Alternative WYCO-B and Route Variation WYCO-B-1 run parallel to Route Variation WYCO-B-3 through the Tuttle Ranch Conservation Easement, offset from the existing 345kV transmission line by 1,500 feet. Tuttle Ranch Conservation Easement is recognized by CPW as containing extensive areas of high quality nesting and brood-rearing habitat. Although the density of sage-grouse on the Tuttle Ranch Conservation Easement property is relatively low compared to other portions of the Northwest Colorado population, the area provides connectivity between key areas of priority habitat from the Axial Basin to the Blue Mountain area (east to west). CPW also recognizes the Tuttle Ranch Conservation Easement property as containing some of the highest densities of white-tailed prairie dog colonies anywhere in northwestern Colorado and a potential preferred location for the future release of black-footed ferrets (CPW 2013a). The extent of mountain plover, yellow-billed cuckoo, and pygmy rabbit potential habitats crossed by each of the WYCO-B route variations are slightly different. The extent of potential habitat for special status wildlife species that would be crossed by each WYCO alternative route is presented in Table 3-105.

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-B in Colorado are presented in Table 3-106.

If selected, Alternative WYCO-B in Colorado could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM Little Snake and White River RMPs that require year-round spatial buffers for active raptor nests. However, exceptions to the BLM-determined buffer distances can be granted by the BLM Field Office manager depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. If an exception or modification is granted, the Applicant may be required to monitor the site for up to 5 years post construction.

Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential mountain plover habitat is crossed by Alternative WYCO-B and its route variations as potential habitat occurs in the majority of the proposed rights-of-way for each of the alternative routes in Colorado (MV-11a).

Special Status Upland Game Birds

In Colorado, Alternative WYCO-B crosses greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks both inside and outside of priority habitats (Table 3-105, MV-12a). The alternative route crosses sage-grouse habitats and sagebrush and sage-steppe vegetation communities predominantly undisturbed by human development from the Wyoming/Colorado border to the intersection with U.S. Highway 40 (MV-12a). The extent of sage-grouse habitat crossed by Alternative WYCO-B is presented in Table 3-109. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

<u>Colorado Sage-grouse Populations Crossed by Alternative WYCO-B and Route Variations</u>

<u>*Northwest Colorado*</u>

The Northwest Colorado sage-grouse population is a large population that occupies a broad geographic area (2,563,033 acres) delineated by topographic and other natural features. Habitats occupied by the sage-grouse population occur in the northwest corner of Colorado in Moffatt, Rio Blanco, and Routt counties (Northwest Colorado Greater Sage-grouse Working Group 2008). The Northwest Colorado sage-grouse population occurs in the southern portion of the Wyoming Basin and northeastern portion of the Colorado Plateau ecoregions. The population is bounded to the east by the Southern Rocky Mountains. Habitats occupied by the population include sagebrush communities interspersed with juniper woodlands. Additionally, occupied sagebrush communities are interspersed with mountain shrub communities at higher elevations and salt desert shrub and greasewood communities at lower elevations. Limiting factors for Northwest Colorado sage-grouse are not well understood. Precipitation is limited in occupied habitat and extreme climatic conditions (e.g., severe drought conditions) can adversely affect sage-grouse forage quality and/or abundance as well as vegetative cover (Northwest Colorado Greater Sage-grouse Working Group 2008).

The population is estimated around 12,000 birds based on average male sage-grouse lek counts (2,100 to 2,500 individual grouse) between 2000 and 2005 (Northwest Colorado Greater Sage-grouse Working Group 2008). Sage-grouse lek attendance in the Northwest Colorado population increased between 1998 and 2006, and the population was believed to be stable to increasing (Northwest Colorado Greater Sage-grouse Working Group 2008).

The Northwest Colorado population appears to have undergone marked decline since 2008. Large tracts of arid, low-elevation sagebrush and salt-desert habitat in the southwest corner of Moffat County (west of Massadona) became vacant prior to the 1990s. These marginal habitats supported small, widely separated groups of breeding birds. Increased prevalence of cheatgrass and other invasive annual weeds across these

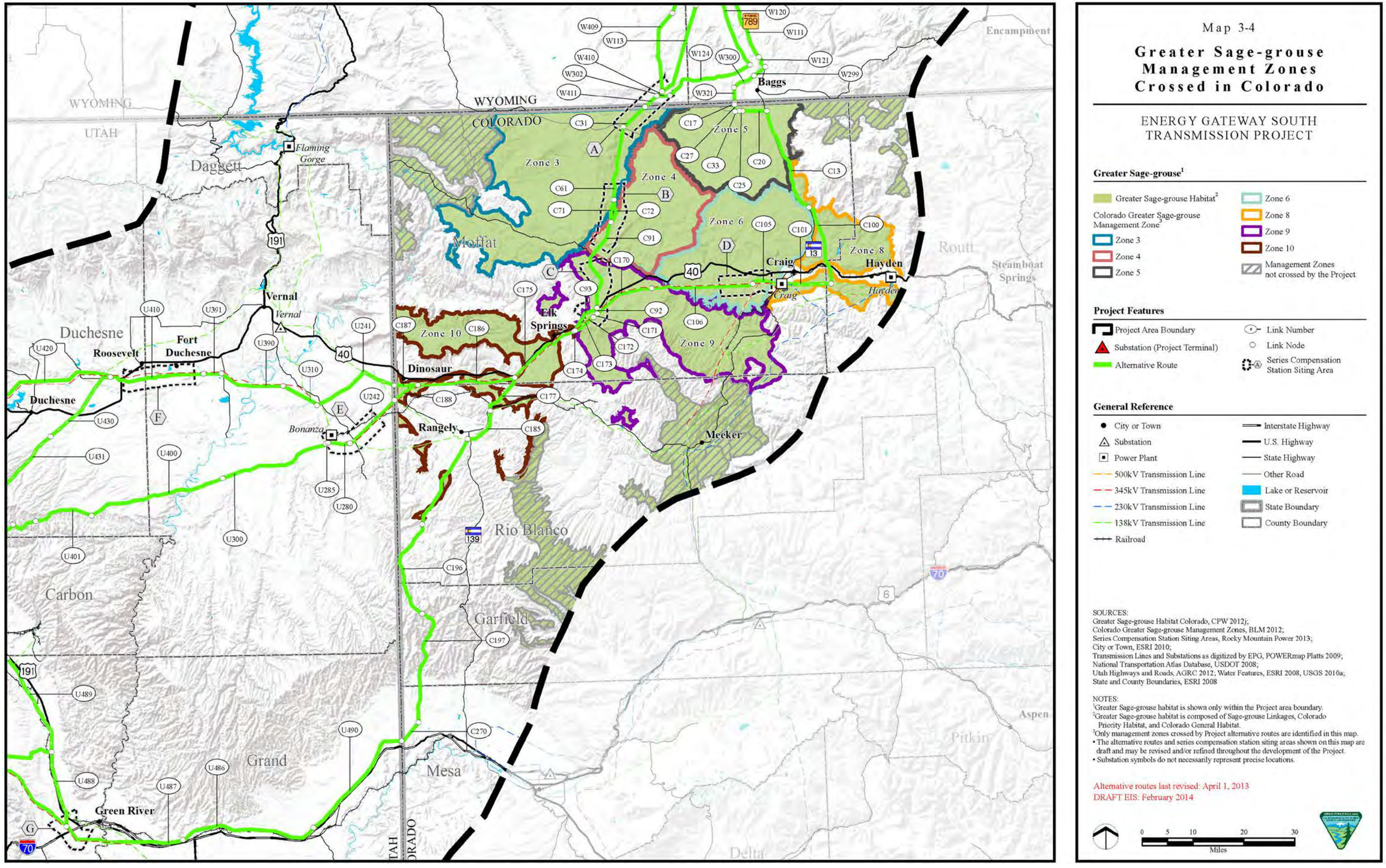
shrub-scrub habitats may have contributed substantially to population declines. A single remaining lek at the eastern, higher-elevation margin of this habitat belt has maintained a small but stable number of attending males (FWS 2013).

Highways, housing development, grain farming, unreclaimed oil and gas wells, juniper woodland expansion, and inundation from water storage projects located in and around sage-grouse habitats have directly and indirectly affected sage-grouse and sage-grouse habitats occupied by the Northwest Colorado population (Northwest Colorado Greater Sage-grouse Working Group 2008). Because of habitat conditions and connectivity, the population is considered to be at low risk, although southern portions of the population are considered less resilient to stressors than northern portions of the population due to habitat fragmentation and reduced connectivity (FWS 2013).

The Northwest Colorado population is contained in the greater Management Zone VII: Colorado Plateau and Management Zone II: Wyoming Basin identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and the Northwest Colorado sage-grouse management area identified in the *Greater Sage-grouse Conservation Objectives Final Report* (FWS 2013).

In addition to the greater WAFWA Management Zone (e.g., Management Zone VII: Colorado Plateau and Management Zone II: Wyoming Basin), the BLM and USFS have identified 21 smaller Colorado Management Zones based on data from the BLM and CPW and sage-grouse population zones in the local and state sage-grouse management plans (Map 3-4). Descriptions of sage-grouse habitat conditions and population trends in each Colorado Management Zone are not available. However, descriptions of sage-grouse habitat conditions and habitat use in the management areas from BLM land health assessments provide some information about each management zone's current condition important to sage-grouse in Colorado (BLM 2013a). The following management areas are crossed by Alternative WYCO-B:

- **Management Zone 3.** The Powder Wash watershed area contains important greater sage-grouse breeding, nesting, and brood rearing habitats, including 10 known leks and approximately 2,400 acres of greater sage-grouse winter range. The Sandhills area provides sage-grouse winter range. The Sandhills and Sand Wash areas both contain important nesting and brood rearing habitat for greater sage-grouse.
- **Management Zone 9.** Trends cannot be evaluated for the birds associated with habitats in the Sagebrush Draw and Indian Valley watershed areas. These birds occupy the southern margin of the Sagebrush Draw population in the Little Snake Field Office, and their abundance and distribution appears to expand and contract commensurate with core population status. Those remaining lands south of the town of Rangely in western Rio Blanco County do not appear to support persistent seasonal use. Leks have never been identified, and the numbers of birds encountered over the past 30 years are few. It is possible these birds occasionally disperse from neighboring Utah.


Map 3-4
Greater Sage-grouse Management Zones Crossed in Colorado
ENERGY GATEWAY SOUTH TRANSMISSION PROJECT
Greater Sage-grouse[1]
Greater Sage-grouse Habitat[2]
Colorado Greater Sage-grouse Management Zone[3]
Zone 3
Zone 4
Zone 5
Zone 6
Zone 8
Zone 9
Zone 10
Management Zones not crossed by the Project
Project Features
Project Area Boundary
Substation (Project Terminal)
Alternative Route
Link Number
Link Node
Series Compensation Station Siting Area
General Reference
City or Town
Substation
Power Plant
500kV Transmission Line
345kV Transmission Line
230kV Transmission Line
138kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Other Road
Lake or Reservoir
State Boundary
County Boundary
SOURCES:
Greater Sage-grouse Habitat Colorado, CPW 2012j;
Colorado Greater Sage-grouse Management Zones, BLM 2012;
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
City or Town, ESRI 2010;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008
NOTES:
[1]Greater Sage-grouse habitat is shown only within the Project area boundary.
[2]Greater Sage-grouse habitat is composed of Sage-grouse Linkages, Colorado Priority Habitat, and Colorado General Habitat.
[3]Only management zones crossed by Project alternative routes are identified in this map.
• The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.
Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014
0 5 10 20 30
Miles
WYOMING
UTAH
COLORADO
Daggett
Flaming Gorge
Vernal
Duchesne
Roosevelt
Fort Duchesne
Bonanza
Dinosaur
Rangely
Elk Springs
Moffat
Craig
Hayden
Baggs
Meeker
Rio Blanco
Garfield
Mesa
Carbon
Grand
Green River
Routt
Steamboat Springs
Encampment
Aspen
Pitkin
Delta
Zone 3
Zone 4
Zone 5
Zone 6
Zone 8
Zone 9
Zone 10

- **Management Zones 9 and 10.** An expansive low-elevation salt-desert complex extending west from Pinyon Ridge along the U.S. Highway 40 corridor and south to the White River supports limited year-round occupation by greater sage-grouse. Ground cover is often dominated by invasive annual weeds, and these xeric habitats are considered marginal in their support of nesting and brood-rearing functions. These areas in Management Zones 9 and 10 have been known to support concentrated high density winter use. The breeding population in the western half of this area (west of Massadona) had begun to collapse prior to the mid-1970s, and this trend continued through the 1980s. The only remaining active lek is located on the far eastern end of the area. Suitable sagebrush stands along U.S. Highway 40 are relatively limited. These predominantly salt desert habitats are dissected by deeply incised channels that assume the role of brood habitat, although the broods along the White River probably originate from the lower Red Wash and Boise Creek areas. The origin of large numbers of wintering birds in lower Wolf Creek is unclear but some of the sage-grouse are likely using the U.S. Highway 40 corridor.

  The Crooked Wash watershed area of Management Zone 10 is administratively split between the White River and the Little Snake Field Offices to the north and is composed of a high percentage of private lands. Although upland sagebrush conditions are superficially adequate for nesting in the White River Field Office, upper portions of the basin are likely preferred by sage-grouse. Late season brood use has been noted, although brood habitat conditions are considered suboptimal in portions of the basin in the White River Field Office. Although a number of channels in the area support persistent flow, riparian expression is extremely limited. Concentrated winter use in the Crooked Wash area is assumed to represent majority of the sage-grouse occupancy. The small summer population in Black's Gulch seems to be a fragment of the Crooked Wash area. This area has also supported concentrated winter use in the past.

Mammals

Alternative WYCO-B crosses the Wolf Creek black-footed ferret reintroduction management area (MV-10a). The alternative route is adjacent to an existing high-voltage 345kV transmission line and U.S. Highway 40 that run through the reintroduction management area. Reintroduced ferrets in the Wolf Creek Management Area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012).

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-B and its route variations in Colorado. Concentrations of potential habitat would be crossed in northern Moffat County, near the Little Snake River, and north of the Moffat/Rio Blanco County border in Colorado, and particularly along U.S. Highway 40 in the Elk Springs area (MV-10a). Colonies near the Moffat/Rio Blanco County border have been affected by previous development of highways and high-voltage transmission lines.

Alternative WYCO-B crosses potential pygmy rabbit habitat that occurs in Colorado north of the Yampa River (MV-10a). Pygmy rabbit potential habitats crossed by Alternative WYCO-B in Colorado have been predominantly unaffected by previous anthropogenic development.

<u>Environmental Consequences (Colorado)</u>

Alternative WYCO-B

<u>Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes</u>

The types of potential effects on special status wildlife that could occur for Alternative WYCO-B in Colorado and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of the selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative WYCO-B

would be similar to the other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Colorado, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Wolf Creek reintroduction management area) as well as sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Moderate impacts would be primarily from impacts on potential pygmy rabbit habitat and sage-grouse habitat within 4 miles of leks located outside of priority habitat. Low impacts would be a result of impacts on sage-grouse general habitats and potential mountain plover habitat. The quantity of high, moderate, and low residual impacts in Colorado would be the same for Alternatives WYCO-B, WYCO-C, and WYCO-F (Table 3-108). Alternative WYCO-B would have less high and moderate residual impacts than Alternative WYCO-D in Colorado (Table 3-108).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative WYCO-B in Colorado is located within 1 mile of known raptor nests (Table 3-106). Additional raptor nests are likely to be located within 1 mile of Alternative WYCO-B in Colorado. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.4.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-B in Colorado, and despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. All of the WYCO alternative routes would result in a similar amount modification of potential mountain plover habitat in Colorado (Table 3-109).

Special Status Upland Game Birds

Some of the impacts on sage-grouse associated with Alternative WYCO-B in Colorado occur outside of existing utility corridors and in areas not substantially altered by previous anthropogenic development activities. In these areas, Alternative WYCO-B avoids priority sage-grouse habitat and sage-grouse leks to the extent feasible. The estimated area of sage-grouse general and priority habitats, as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Colorado by Alternative WYCO-B is presented in Table 3-106.

From where the alternative joins the U.S. Highway 40 corridor to the end of the alternative route, Alternative WYCO-B is primarily located in a designated utility corridor and adjacent to linear disturbances including U.S. Highway 40 and an existing high-voltage transmission line that have degraded the quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043).

The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative WYCO-B during the past 5 years, and the percentage of the Colorado statewide sage-grouse average male lek counts that this represents, are presented in Table 3-107.

Mammals

Black footed-ferret occurrences have not been recorded since a 2008 and 2009 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 4 years, and reintroductions are not currently taking place (Ausmus 2012). If ferrets are not present in the Wolf Creek reintroduction management area, ferrets would not be affected by Alternative WYCO-B. However, if black-footed ferret reintroductions are resumed in the future, Alternative WYCO-B could result in effects described in Section 3.2.8.4.

Potentially suitable white-tailed prairie dog colonies and pygmy rabbit habitat are present along the majority of the WYCO alternative routes throughout Colorado. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. However, much of the white-tailed prairie dog potential colonies and pygmy rabbit habitats between the Wyoming/Colorado state line and U.S. Highway 40 have not been affected by previous human development. The magnitude of effects of Alternative WYCO-B on white-tailed prairie dog potential colonies could be less where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-B crosses the same extent of white-tailed prairie dog potential colonies as WYCO-C and WYCO-F and considerably less than Alternative WYCO-D in Colorado (Table 3-109).

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Slight differences occur in the extent of disturbance (in acres) to mountain plover, yellow-billed cuckoo, and pygmy rabbit potential habitats as well as habitats within 4 miles of sage-grouse leks within and outside of general and priority sage-grouse habitat from Alternative WYCO-B and Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Colorado (Table 3-109).

In the Tuttle Ranch Conservation Easement area, Alternative WYCO B and Route Variations WYCO-B-1 and WYCO-B-3 cross the Tuttle Ranch Conservation Easement and would have the greatest impacts on sage-grouse habitats and white-tailed prairie dog potential colonies (Table 3-109). Route Variation WYCO-B-2 avoids the Tuttle Ranch Conservation Easement area and would have less impact on sage-grouse habitats and white-tailed prairie dog potential colonies (Table 3-109).

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

In many areas, Alternative WYCO-C and route variations in Wyoming follow the same alignment as Alternative WYCO-B and route variations between the Aeolus Substation and Wamsutter in Wyoming. This alternative route follows an existing pipeline corridor approximately 5 miles west of Alternative WYCO-B between Wamsutter and the Wyoming/Colorado state line. The dominant vegetation communities, special status wildlife species, and habitats present and likely to be affected by Alternative WYCO-C are the same as those for Alternative WYCO-B described at the beginning of Section 3.2.8.5. Slight differences occur between the number of miles of special status wildlife habitats crossed by Alternative WYCO-C and its route variations in Wyoming (Table 3-105).

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-C in Wyoming are presented in Table 3-106.

Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

If selected, Alternative WYCO-C could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM Rawlins Field Office RMP requiring a year-round 825-foot spatial buffer for active raptor nests (1,200 feet for ferruginous hawk nests). However, exceptions to the BLM-determined buffer distances can be granted depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. Proposed projects that could adversely affect raptors in the Rawlins Field Office boundaries are evaluated on a case by case basis by BLM resource specialists (BLM 2008b).

Potential mountain plover potential habitat occurs throughout the majority of the length of Alternative WYCO-C and route variations in Wyoming (MV-11a).

Special Status Upland Game Birds

In Wyoming, Alternative WYCO-C crosses sage-grouse core areas and habitats within 4 miles of leks both inside and outside core areas (Table 3-105, MV-12a). Where crossing greater sage-grouse core areas and priority habitats, this alternative would be located within a transmission line corridor designated by Wyoming Executive Order 2011-5 or parallel to an existing high-voltage transmission line. Alternative WYCO-C would cross the same sage-grouse population areas in Wyoming as Alternative WYCO-B. The extent of sage-grouse habitat crossed by Alternative WYCO-C is presented in Table 3-105. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

Mammals

Alternative WYCO-C in Wyoming would follow the same geographic path through the Shirley Basin black-footed ferret reintroduction management area as Alternative WYCO-B (MV-10a); therefore, the two routes would cross the same extent of the reintroduction management area in Wyoming (Table 3-105).

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-C and its route variations in Wyoming. Concentrations of potential colonies are crossed where Alternative WYCO-C would continue south of Wamsutter approaching the Barrel Springs area. Alternative WYCO-C would run south from Wamsutter parallel to an existing pipeline corridor to the Wyoming/Colorado state line. White-tailed prairie dog potential colonies also occur in the southeast corner of Sweetwater County, Wyoming, where this alternative route crosses shrub/sage-steppe and sagebrush communities unaffected by existing human development southwest of Flat Top Mountain at the Wyoming/Colorado border (MV-10a).

Alternative WYCO-C and route variations cross pygmy rabbit potential habitat along the majority of the alternative route and route variations in Wyoming in areas of existing energy and transportation development from the Aeolus Substation to Wamsutter and parallel to an existing pipeline corridor to the Wyoming/Colorado state line (MV-10a).

Environmental Consequences (Wyoming)

Alternative WYCO-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative WYCO-C in Wyoming and the degree to which these effects would be mitigated or avoided are described in

Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative WYCO-C would be similar to the other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Wyoming, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Shirley Basin reintroduction management area) as well as sage-grouse core areas and habitats within 4 miles of leks located in core areas. Moderate impacts would be primarily from impacts on potential pygmy rabbit habitat and sage-grouse habitat within 4 miles of leks located outside of core areas. Low impacts would be a result of impacts on sage-grouse general habitats and transmission line corridors and potential mountain plover habitat. The quantity of high residual impacts would be the same for Alternatives WYCO-B, WYCO-C, and WYCO-F (Table 3-108). Alternative WYCO-C would have a comparable amount of moderate impacts on Alternative WYCO-D and less moderate impacts than Alternative WYCO-F.

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project and seasonal restrictions on construction and maintenance activities would be implemented in accordance with agency policies and plans (Selective Mitigation Measure 12). Alternative WYCO-C in Wyoming is located within 1 mile of known raptor nests (Table 3-106). Similar to Alternative WYCO-B, exceptions to a CSU stipulation in the BLM Rawlins Field Office RMP which prohibits construction of structures requiring repeated human presence within 825 feet of active raptors nests (1,200 feet for ferruginous hawks) may be granted by BLM for Alternative WYCO-C. If exceptions to CSU stipulations identified in the BLM Rawlins Field Office RMP were granted, BLM would require additional mitigation measures to reduce and monitor potential effects on raptors nesting in CSU areas. These additional mitigation measures and monitoring would be the same as those described for Alternative WYCO-B. After mitigation, impacts associated with the Project are described in Section 3.2.8.4 and would not be anticipated to cause a decline in raptor populations in the Project area in Wyoming.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-B in Wyoming, and despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative WYCO-C would result in modification of the same area of potential mountain plover habitat as Alternative WYCO-F and more than Alternatives WYCO-B and WYCO-D in Wyoming (Table 3-109).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative WYCO-C in Wyoming would occur in transmission corridors designated by Wyoming Executive Order 2011-005, in designated BLM-utility corridors, or in areas where this alternative route is parallel to an existing high-voltage transmission line or other linear disturbances that have degraded the existing quality of sage-grouse habitats (e.g., I-80). Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure also would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated disturbance of sage-grouse core areas, as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Wyoming by Alternative WYCO-C is presented in Table 3-105.

Alternative WYCO-C parallels an existing underground pipeline corridor from the I-80 to the Wyoming/Colorado state line. The alternative route is outside of designated core areas in this area but crosses within 4 miles of sage-grouse leks. The methods used to establish core area boundaries in Wyoming considered sage-grouse lek attendance and leks in core areas constitute a large percentage of the statewide sage-grouse population in Wyoming (Doherty et al. 2011). The leks influenced by this alternative route generally have low sage-grouse attendance and presumably have relatively lower importance for maintaining statewide sage-grouse populations than leks with higher attendance and leks located with a core area. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative WYCO-B during the past 5 years, and percentage of the average Wyoming statewide sage-grouse male lek counts that this represents, are presented in Table 3-110.

Mammals

Alternative WYCO-C crosses the southwestern edge of the Shirley Basin black-footed ferret management area (MV-10a). Habitats crossed in the management area are rugged terrain and only support low densities of prairie dog towns at this time, which are an essential component of black-footed ferret habitat. Due to the disperse nature of prairie dog towns, the area in the Shirley Basin black-footed ferret management area potentially affected by Alternative WYCO-B is unlikely to support black-footed ferret. Alternatives WYCO-B, WYCO-C, and WYCO-F cross the same extent of the Shirley Basin black-footed ferret management area (Table 3-110), and comparably more than Alternative WYCO-D in Wyoming.

Potentially suitable white-tailed prairie dog colonies and pygmy rabbit habitat are present along the majority of Alternative WYCO-C in Wyoming. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4.

The magnitude of effects of Alternative WYCO-C on white-tailed prairie dog potential colonies and pygmy rabbit habitat could be less, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-C crosses less potential white-tailed prairie dog potential colonies than Alternatives WYCO-F and WYCO-B. Alternative WYCO-C in Wyoming crosses the same extent of potential pygmy rabbit habitat as Alternative WYCO-B and considerably less than Alternatives WYCO-D and WYCO-F (Table 3-109).

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

The environmental consequences for Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming are the same as Alternative WYCO-C as they follow the same alignment.

Affected Environment (Colorado)

The affected environment for Alternative WYCO-C and its route variations in Colorado is the same as Alternative WYCO-B and its route variations (Table 3-105) as the two routes follow the same alignment.

Environmental Consequences (Colorado)

Alternative WYCO-C

The environmental consequences for Alternative WYCO-C in Colorado would be the same as Alternative WYCO-B (Table 3-105) as the two routes follow the same alignment.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Slight differences occur in the area of disturbance (in acres) to mountain plover, yellow-billed cuckoo, and pygmy rabbit potential habitats as well as habitats within 4 miles of sage-grouse leks within and outside of general and priority sage-grouse habitat from Alternative WYCO-C and Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Colorado (Table 3-109).

In the Tuttle Ranch Conservation Easement area, Alternative WYCO C, Route Variations WYCO-C-1, and WYCO-C-3 cross the Tuttle Ranch Conservation Easement and would have the greatest impacts on sage-grouse habitats and white-tailed prairie dog potential colonies. Route Variation WYCO-C-2 avoids the Tuttle Ranch Conservation Easement area and would have less impact on sage-grouse habitats and white-tailed prairie dog potential colonies (Table 3-109).

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D and Route Variation WYCO-D-1 run east of Hanna adjacent to an existing transmission line and existing wind energy development. East of Hanna, both the route variation and the alternative route follow the same alignment as Alternatives WYCO-B, WYCO-C, and WYCO-F to Wamsutter. Alternative WYCO-D is located farther east than the other WYCO alternative routes and would parallel Wyoming Highway 789 to Baggs through existing gas and oil development areas and riparian habitat in Baggs. The dominant vegetation types and special status wildlife and their habitats present and likely to be affected by this alternative route are the same as those described for Alternative WYCO-B at the beginning of Section 3.2.8.5 (Table 3-105).

The area of potential habitat for special status wildlife species that would be crossed by each WYCO alternative route is presented in Table 3-105.

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-D in Wyoming are presented in Table 3-105. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

If selected, Alternative WYCO-D could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM Rawlins Field Office RMP requiring a year-round 825-foot spatial buffer for active raptor nests (1,200 feet for ferruginous hawk nests). However, exceptions to the BLM-determined buffer distances can be granted depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. Proposed projects that could adversely affect raptors in the Rawlins Field Office boundaries are evaluated on a case by case basis by BLM resource specialists (BLM 2008b).

Potential mountain plover habitat occurs throughout the majority of the length of Alternative WYCO-B and route variations in Wyoming, with exception of the portion of Alternative WYCO-D that heads south at Wamsutter and the area just north of Baggs (MV-11a).

Special Status Upland Game Birds

In Wyoming, Alternative WYCO-D crosses sage-grouse core areas and habitats within 4 miles of leks both inside and outside core areas (Table 3-105, MV-12a). Unlike Alternatives WYCO-B and WYCO-C,

Alternative WYCO-D is not located in a utility corridor designated in Wyoming Executive Order 2011-005 where it crosses the Hanna core area, however the alternative would be parallel to an existing high-voltage transmission line in this area. Additionally, between the I-80 corridor and the Wyoming/Colorado state line. Alternative WYCO-D crosses in proximity to a sage-grouse core area and is located in sage-grouse habitats within 4 miles of leks located in core areas. Alternative WYCO-D would cross the same sage-grouse population areas in Wyoming as Alternative WYCO-B. The extent of sage-grouse habitat crossed by Alternative WYCO-D is presented in Table 3-105. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

Mammals

Alternative WYCO-D in Wyoming crosses the western portion of the Shirley Basin black-footed ferret reintroduction management area (MV-10a). Habitats in this area currently support low densities of white-tailed prairie dogs, and it is unlikely that black-footed ferrets occupy this part of the reintroduction management area.

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-D and its route variations in Wyoming. Concentrations of potential colonies are crossed just south of Creston where Alternative WYCO-D would travel south, along Coal Gulch area where this alternative route approaches the Mexican Flats area at the Peach Orchard Flat area where Alternative WYCO-B runs parallel to Wyoming Highway 789 through fields of existing gas and oil development and at the Wyoming/Colorado state line west of Baggs (MV-10a). Habitats along Coal Gulch and along Wyoming Highway 789 have been affected by previous oil and gas development; however, potential habitats in southwestern Carbon County have been largely unaffected by previous anthropogenic development.

Environmental Consequences (Wyoming)

Alternative WYCO-D

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative WYCO-D in Wyoming and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Wyoming under Alternative WYCO-D would be similar to the other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Wyoming, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Shirley Basin reintroduction management area) as well as sage-grouse core areas and habitats within 4 miles of leks located in core areas. Moderate impacts would be primarily from impacts on potential pygmy rabbit habitat and sage-grouse habitat within 4 miles of leks located outside of core areas or priority habitat. Low impacts would be a result of impacts on sage-grouse general habitats in transmission line corridors and potential mountain plover habitat. Alternative WYCO-D would have the most high impacts and least moderate impacts of any of the WYCO routes in Wyoming (Table 3-108).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project and seasonal restrictions on construction and maintenance activities would be implemented in accordance with agency policies and plans (Selective Mitigation

Measure 12). Alternative WYCO-D in Wyoming is located within 1 mile of known raptor nests (Table 3-106). Similar to Alternative WYCO-B, exceptions to a CSU stipulation in the BLM Rawlins Field Office RMP which prohibits construction of structures requiring repeated human presence within 825 feet of active raptors nests (1,200 feet for ferruginous hawks) may be granted by BLM for Alternative WYCO-D. If exceptions to CSU stipulations identified in the BLM Rawlins Field Office RMP were granted, BLM would require additional mitigation measures to reduce and monitor potential effects on raptors nesting in CSU areas. These additional mitigation measures and monitoring would be the same as those described for Alternative WYCO-B. After mitigation, impacts associated with the Project are described in Section 3.2.8.4 and would not be anticipated to cause a decline in raptor populations in the Project area in Wyoming.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-D in Wyoming, and despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative WYCO-D would result in modification of more potential mountain plover habitat than Alternative WYCO-B and considerably less than Alternatives WYCO-C and WYCO-F in Wyoming (Table 3-109).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative WYCO-D in Wyoming would occur in transmission corridors designated by Wyoming Executive Order 2011-005, in designated BLM-utility corridors, or in areas where this alternative route is parallel to an existing high-voltage transmission line or other linear disturbances that have degraded the existing quality of sage-grouse habitats (e.g., I-80). Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure also would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse core areas, as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Wyoming by Alternative WYCO-D is presented in Table 3-105.

As Alternative WYCO-D crosses south from the I-80 corridor to the Wyoming/Colorado state line, it parallels Wyoming Highway 789 and is located in a BLM-designated utility corridor. The alternative route is in proximity to the Greater South Pass sage-grouse core area and within 4 miles of sage-grouse leks in this core area. Alternative WYCO-D is located within 4 miles of the largest sage-grouse leks (e.g., leks attended by more male sage-grouse) of any of the alternative routes in Wyoming except Alternative WYCO-F. Thus, this alternative route would potentially adversely affect leks having a larger importance for maintaining statewide sage-grouse populations than leks with lesser attendance (Table 3-110). The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative WYCO-B during the past 5 years, and percentage of the average Wyoming statewide sage-grouse male lek counts that this represents, are presented in Table 3-110.

Mammals

Alternative WYCO-D crosses the southwestern edge of the Shirley Basin black-footed ferret management area (MV-10a). Habitats crossed in the management area only support low densities of prairie dog towns at this time, which are an essential component of black-footed ferret habitat. Due to the disperse nature of prairie dog towns, the area in the Shirley Basin black-footed ferret management area potentially affected by Alternative WYCO-D is unlikely to support black-footed ferret. Alternative WYCO-D in Wyoming crosses more black-footed ferret management areas than Alternatives WYCO-B, WYCO-C, and WYCO-F (Table 3-109).

Potentially suitable white-tailed prairie dog colonies and pygmy rabbit habitat are present along the majority of Alternative WYCO-D in Wyoming. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4.

The magnitude of effects of Alternative WYCO-D on white-tailed prairie dog potential colonies and pygmy rabbit habitat could be less, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-D crosses more potential white-tailed prairie dog potential colonies than Alternatives WYCO-F and WYCO-B and considerably more than Alternative WYCO-C in Wyoming. Alternative WYCO-D in Wyoming crosses the same extent of potential pygmy rabbit habitat as Alternative WYCO-F and considerably more than Alternatives WYCO-B and WYCO-C (Table 3-109).

Alternative WYCO-D Route Variation (WYCO-D-1)

The environmental consequences for Route Variation WYCO-D-1 are same as Alternative WYCO-D in Wyoming as they follow the same alignment.

Affected Environment (Colorado)

Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado follow a different geographical route than all other WYCO alternative routes heading south along Colorado State Highway 13 to Craig, then west along U.S. Highway 40 and parallel to an existing transmission line before converging with all other WYCO alternative routes south of Maybell. The total mileage of Alternative WYCO-D route in Colorado would be twice that of all other WYCO alternative routes. Dominant vegetation communities are similar to those described for Alternative WYCO-B but also include agricultural land. Special status wildlife species and habitats present and likely to be affected by this alternative route are described at the beginning of Section 3.2.8.5 and in Table 3-105.

Alternative WYCO-D and Route Variation WYCO-D-1 follow a different geographical route through the Tuttle Ranch Conservation Easement area in Colorado. Alternative WYCO-D runs parallel to an existing 345kV transmission line offset by 1,500 feet through the Tuttle Ranch Conservation Easement Area, while Route Variation WYCO-D-1 is colocated at the minimum separation distance technically feasible with the exiting 345kV transmission line. Tuttle Ranch Conservation Easement is recognized by CPW as containing extensive areas of high quality nesting and brood-rearing habitat. Although the density of sage-grouse on the Tuttle Ranch Conservation Easement property is relatively low compared to other portions of the Northwest Colorado population, the area provides connectivity between key areas of priority habitat from the Axial Basin to the Blue Mountain area (east to west). CPW also recognizes the Tuttle Ranch Conservation Easement property as containing some of the highest densities of white-tailed prairie dog colonies anywhere in northwestern Colorado and a potential preferred location for the future release of black-footed ferrets (CPW 2013a).

Slight differences also occur in the extent of mountain plover, yellow-billed cuckoo, and pygmy rabbit potential habitats crossed by Alternative WYCO-D and Route Variation WYCO-D-1. The extent of potential habitat for special status wildlife species that would be crossed by each WYCO alternative route is presented in Table 3-105.

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-D in Colorado are presented in Table 3-106. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

If selected, Alternative WYCO-D in Colorado could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM Little Snake and White River RMPs that require year-round spatial buffers for active raptor nests. However, exceptions to the BLM-determined buffer distances can be granted by the BLM Field Office manager depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. If an exception or modification is granted, the Applicant may be required to monitor the site for up to 5 years post construction.

Potential yellow-billed cuckoo habitat is crossed in Colorado at intersections of Alternative WYCO-D with the Little Snake River at the Wyoming/Colorado state line and south of the intersection with U.S. Highway 40 east of Craig.

Potential mountain plover habitat is crossed by Alternative WYCO-D and its route variation as potential habitat occurs throughout the majority of the length of each of the alternative routes in Colorado (MV-11a).

Potential Mexican spotted owl habitat is crossed by Alternative WYCO-D in the Juniper Mountain area located just south of U.S. Highway 40 approximately 4 miles east of Maybell near the Yampa River. However, owls are not known to occupy the potential habitat at this time.

Special Status Upland Game Birds

In Colorado, Alternative WYCO-D crosses sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks both inside and outside of priority habitats (Table 3-105, MV-12a). Alternative WYCO-D would cross the same sage-grouse population areas in Colorado as Alternative WYCO-B. The alternative route is parallel to existing linear disturbances, including Colorado State Highways 13 and 40 and an existing high-voltage transmission line (MV-12a). The extent of sage-grouse habitat crossed by Alternative WYCO-D is presented in Table 3-105. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

<u>Colorado Sage-grouse Populations Crossed by Alternative WYCO-D and Route Variation WYCO-D-1</u>

<u>*Northwest Colorado*</u>

In addition to crossing the U.S. Highway 40 corridor, Crooked Wash, and Sagebrush Draw areas in Management Zones 9 and 10 (refer to the descriptions of these areas under Alternative WYCO-B, Affected Environment), Alternative WYCO-D also crosses Management Zones 5, 6, and 9 (Map 3-4). Sage-grouse habitat conditions and habitat use in the management zones have been summarized below from information provided in BLM land health assessments (FWS 2013):

- **Management Zone 5.** The entire landscape surrounding the Fourmile Creek area is considered a greater sage-grouse production area, although the quality of greater sage-grouse brood-rearing habitat has been reduced by heavy historic grazing, especially in mesic areas at the higher elevations. The large expanses of sagebrush steppe intermixed with wet meadows provide important greater sage-grouse nesting and brood rearing habitats along Timberlake Creek.

Fourteen greater sage-grouse leks have been identified and brood-rearing habitats have been documented.

- **Management Zone 6.** Sagebrush grasslands and sagebrush mixed shrub habitat types in the Williams Fork area have the potential to support greater sage-grouse within this landscape. There are no identified greater sage-grouse leks or critical habitat, such as nesting or winter, located in the Williams Fork watershed.

  The Lay Creek watershed area provides breeding, nesting, brood-rearing and wintering habitat throughout the year. Lay Creek is an important production area for greater sage-grouse in Colorado. There are seven active greater sage-grouse leks in this watershed with two additional active leks within 1 mile of the watershed boundary. Some portions of the watershed are capable of providing all four habitat requirements in the same area.

- **Management Zone 9.** Greater sage-grouse habitat types in the Axial Basin landscape include strutting grounds, brood-rearing habitat, and winter range. In this landscape, 30 leks have been documented: 11 (37 percent) are active; 6 (20 percent) are inactive (no activity the last 5 years), 11 (37 percent) are historic (no activity the last 6 years or longer), and 2 (7 percent) are unknown.

Alternative WYCO-D in Colorado also crosses Columbian sharp-tailed grouse winter habitat and habitats within 4 miles of leks (Table 3-106).

Mammals

Alternative WYCO-D crosses the Wolf Creek black-footed ferret reintroduction management area (MV-10a). The alternative route is adjacent to an existing transmission line and U.S. Highway 40 that run through the reintroduction management area. Reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012).

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-D and its route variations in Colorado. Concentrations of potential colonies are crossed southeast of Baggs along the Wyoming Highway 789 corridor to the west of Elkhead Mountain, along the U.S. Highway 40 disturbance corridor including where this alternative route continues west at Craig, and near Maybell south to the Moffat/Rio Blanco County border in Colorado (MV-10a)

Alternative WYCO-D and its route variation cross potential pygmy rabbit habitat in Colorado north of the Yampa River (MV-10a). Pygmy rabbit potential habitats crossed by Alternative WYCO-D in Colorado have been predominantly unaffected by previous anthropogenic development.

<u>Environmental Consequences (Colorado)</u>

Alternative WYCO-D

<u>Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes</u>

The types of potential effects on special status wildlife that could occur for Alternative WYCO-D in Colorado and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative WYCO-D would be greater than other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Colorado, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Wolf Creed reintroduction management area) as well as sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Moderate impacts would be primarily from impacts on potential pygmy rabbit habitat and sage-

grouse habitat within 4 miles of leks located outside of priority habitat. Low impacts would be a result of impacts on sage-grouse general habitats in transmission line corridors and potential mountain plover habitat. Alternative WYCO-D has the most high residual impacts on special status wildlife resources and a comparable amount of moderate residual impacts compared to other routes in the WYCO grouping in Colorado (Table 3-108).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative WYCO-D in Colorado is located within 1 mile of known raptor nests (Table 3-106). Additional raptor nests are likely to be located within 1 mile of Alternative WYCO-D in Colorado. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.4.

Alternative WYCO-D is the only alternative in the WYCO grouping that crosses potential yellow-billed cuckoo habitat in Colorado (Table 3-109). Despite the implementation of temporal and spatial avoidance selective mitigation measures, some loss of riparian vegetation along the Little Snake and Yampa rivers in Moffat County that may provide suitable habitat for yellow-billed cuckoos could occur. If yellow-billed cuckoos use riparian habitats along the Little Snake and Yampa rivers, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the Little Snake and Yampa rivers in Moffat County.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-D in northern Colorado, and despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative WYCO-D would result in modification of considerably less potential mountain plover habitat than Alternatives WYCO-B, WYCO-C and WYCO-F in Colorado (Table 3-109).

Mexican spotted owls are not known to occupy the potential habitat crossed by Alternative WYCO-D in the Juniper Mountain area, though no formal surveys have been completed. If Mexican spotted owls are detected during preconstruction surveys, selective mitigation measures for seasonal and spatial avoidance would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of clearing of trees for safe operation of the transmission line. Alternative WYCO-D is the only alternative in the WYCO grouping that would affect potential Mexican spotted owl habitat in Colorado.

Special Status Upland Game Birds

The estimated area of Columbian sharp-tailed grouse winter habitat affected, as well as the estimated area of habitat affected within 4 miles of leks in Colorado by Alternative WYCO-D, is presented in Table 3-106.

Some of the impacts on sage-grouse associated with Alternative WYCO-D in Colorado occur inside existing designated utility corridors and in areas altered by previous anthropogenic development

activities, including construction of highways and high-voltage transmission lines that have degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure also would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse priority habitats as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Wyoming by Alternative WYCO-D is presented in Table 3-107.

However, despite being located in habitats that have been previously affected by anthropogenic activities, Alternative WYCO-D is located within 2, 4, and 11 miles of substantially more sage-grouse leks than all of the other alternative routes in Colorado (Table 3-107). Additionally, the average number of male sage-grouse counted on the leks within 4 miles of Alternative WYCO-D during the past 5 years is substantially larger than the average number of male sage-grouse counted on leks within 4 miles of all other alternative routes in Colorado (Table 3-110). The number of male sage-grouse counted on leks within 4 miles of Alternative WYCO-D suggests habitats that could be affected by this alternative route are more important for maintaining the statewide sage-grouse population than habitats affected by other WYCO alternative routes in Colorado.

Mammals

Black footed-ferret occurrences have not been recorded since a 2008 and 2009 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 4 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, Alternative WYCO-D could result in effects described in Section 3.2.8.4. Alternative WYCO-D affects the same extent of black-footed ferret management area as Alternatives WYCO-B, WYCO-B, and WYCO-F in Colorado (Table 3-109).

Potentially suitable white-tailed prairie dog colonies and pygmy rabbit habitat are present along Alternative WYCO-D in Colorado. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4.

The magnitude of effects of Alternative WYCO-D on white-tailed prairie dog potential colonies and pygmy rabbit habitat could be less, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-D crosses more potential white-tailed prairie dog colonies than Alternatives WYCO-B, WYCO-C, and WYCO-F in Colorado (Table 3-109). Alternative WYCO-D crosses considerably less potential pygmy rabbit habitat than Alternatives WYCO-B, WYCO-C, and WYCO-F in Colorado (Table 3-109).

Alternative WYCO-B crosses the same extent of potential white-tailed prairie dog potential colonies as Alternative WYCO-F, more than Alternative WYCO-C and less than Alternative WYCO-D in Wyoming. Alternative WYCO-B in Wyoming crosses the same extent of potential pygmy rabbit habitat as Alternative WYCO-C and considerably less than Alternatives WYCO-D and WYCO-F.

Alternative WYCO-D Route Variation (WYCO-D-1)

Slight differences occur in the extent of disturbance (in acres) to mountain plover potential habitats as well as habitats within 4 miles of sage-grouse leks in general and priority sage-grouse habitat from Alternative WYCO-D and Route Variation WYCO-D-1 in Colorado (Table 3-105).

In the Tuttle Ranch Conservation Easement area, Route Variation WYCO-D-1 would reduce the separation between the Project and an existing 345kV steel lattice high voltage transmission line. Reducing the separation between the project and the existing transmission line may reduce impacts on special status wildlife and their habitats in this area.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming follow the same alignment as Alternative WYCO-B between the Aeolus Substation and Wamsutter in Wyoming. Between Wamsutter and the Wyoming/Colorado state line, the alternative route crosses shrub/shrub-steppe and sagebrush habitats, existing roads, and energy development east of Flat Top Mountain. The dominant vegetation communities, special status wildlife species, and habitats present and likely to be affected by Alternative WYCO-F and its route variations are the same as those for Alternative WYCO-B described at the beginning of Section 3.2.8.5. The extent of potential habitat for special status wildlife species that would be crossed by each WYCO alternative route is presented in Table 3-105.

Birds

Special Status Raptors and Migratory Birds

The numbers of known bald eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative WYCO-F in Wyoming are presented in Table 3-106. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

If selected, Alternative WYCO-F could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM Rawlins Field Office RMP requiring a year-round 825-foot spatial buffer for active raptor nests (1,200 feet for ferruginous hawk nests). However, exceptions to the BLM-determined buffer distances can be granted depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. Proposed projects that could adversely affect raptors in the Rawlins Field Office boundaries are evaluated on a case by case basis by BLM resource specialists (BLM 2008b).

Potential yellow-billed cuckoo habitat is crossed by Alternative WYCO-F along the Coal Gulch stream corridor running parallel to Wamsutter Road through fields of existing oil exploration (well pads/oil fields) at the intersection of North Fork Cottonwood Creek and the Sweetwater/Carbon county border along Sand Creek in relatively undisturbed riparian and wetland communities in Wyoming (MV-11a).

Potential mountain plover habitat occurs throughout the majority of the length of Alternative WYCO-F and route variations in Wyoming (MV-11a).

Special Status Upland Game Birds

In Wyoming, Alternative WYCO-F crosses sage-grouse core areas and habitats within 4 miles of leks both inside and outside core areas (Table 3-105, MV-12a). Where crossing greater sage-grouse core areas and priority habitats, this alternative would be located within a transmission line corridor designated by Wyoming Executive Order 2011-5 or parallel to an existing high-voltage transmission line. Alternative WYCO-F would cross the same sage-grouse population areas in Wyoming as Alternative WYCO-B. The extent of sage-grouse habitat crossed by Alternative WYCO-F is presented in Table 3-105. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-107.

Mammals

Alternative WYCO-F in Wyoming would follow the same geographic path through the Shirley Basin black-footed ferret reintroduction management area as Alternative WYCO-B (MV-10a); therefore, the two routes would cross the same extent of the reintroduction management area in Wyoming (Table 3-105).

White-tailed prairie dog potential colonies would be crossed by Alternative WYCO-F and its route variations in Wyoming. Concentrations of potential colonies occur along Coal Gulch where Alternative WYCO-F continues south of Wamsutter approaching the Mexican Flats area. Alternative WYCO-F runs parallel to Wamsutter Road through fields of existing oil exploration (well pads/oil fields). White-tailed prairie dog potential colonies also occur in the southwest corner of Carbon County, Wyoming, where this alternative route crosses relatively undisturbed shrub/sage-steppe and sagebrush communities along the southeast of Flat Top Mountain (MV-10a).

Pygmy rabbit potential habitat occurs along the majority of Alternative WYCO-F in areas of existing energy and transportation development from the Aeolus Substation to Wamsutter, as well as areas of pristine habitat east of Flat Top Mountain in Wyoming (MV-10a).

Environmental Consequences (Wyoming)

Alternative WYCO-F

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative WYCO-F in Wyoming and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Wyoming under Alternative WYCO-F would be similar to the other WYCO alternative routes (Table 3-108; MV-10a, MV-11a, and MV-12a). In Wyoming, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Shirley Basin reintroduction management area) as well as sage-grouse core areas and habitats within 4 miles of leks located in core areas. Moderate affects would be primarily from impacts on potential pygmy rabbit habitat and sage-grouse habitat within 4 miles of leks located outside of core areas. Low impacts would be a result of impacts on sage-grouse general habitats in transmission line corridors and potential mountain plover habitat. The quantity of high residual impacts would be the same for Alternatives WYCO-B, WYCO-C, and WYCO-F (Table 3-108). Alternative WYCO-F has the most moderate residual impacts on special status wildlife resources in the WYCO grouping in Wyoming (Table 3-108).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project and seasonal restrictions on construction and maintenance activities would be implemented in accordance with agency policies and plans (Selective Mitigation Measure 12). Alternative WYCO-F in Wyoming is located within 1 mile of known raptor nests (Table 3-106). Similar to Alternative WYCO-B, exceptions to a CSU stipulation in the BLM Rawlins Field Office RMP which prohibits construction of structures requiring repeated human presence within 825 feet of active raptors nests (1,200 feet for ferruginous hawks) may be granted by BLM for Alternative WYCO-F. If exceptions to CSU stipulations identified in the BLM Rawlins Field Office RMP were

granted, BLM would require additional mitigation measures to reduce and monitor potential effects on raptors nesting in CSU areas. These additional mitigation measures and monitoring would be the same as those described for Alternative WYCO-B. After mitigation, impacts associated with the Project are described in Section 3.2.8.4 and would not be anticipated to cause a decline in raptor populations in the Project area in Wyoming.

Some loss of riparian vegetation along Coal Gulch and Red Creek that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats along Coal Gulch and Red Creek, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along in Carbon County. Alternative WYCO-F would result in a loss of more potential yellow-billed cuckoo habitat than Alternative WYCO-C but less than Alternative WYCO-F and considerably less than Alternative WYCO-D in Wyoming (Table 3-109).

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative WYCO-F in Wyoming, and despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-109). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative WYCO-F would result in modification of more potential mountain plover habitat than Alternatives WYCO-D and WYCO-B and less than Alternative WYCO-C in Wyoming (Table 3-109).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative WYCO-F in Wyoming would occur in transmission corridors designated by Wyoming Executive Order 2011-005, in areas where other linear disturbances have degraded the existing quality of sage-grouse habitats (e.g., I-80), and in areas where disperse oil and gas development is occurring. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure also would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse core areas, as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Wyoming by Alternative WYCO-B is presented in Table 3-105.

Alternative WYCO-F is located within 2 miles of more sage-grouse leks than Alternatives WYCO-B or WYCO-C and an equal number of leks as Alternative WYCO-D (Table 3-105). Similarly, Alternative WYCO-F is located within 4 miles of more sage-grouse leks than Alternatives WYCO-B or WYCO-C (Table 3-105). Additionally, Alternative WYCO-F is located within 4 miles of the sage-grouse leks attended by more male grouse than other alternative routes in Wyoming. Thus, this alternative route could presumably influence leks having larger importance for maintaining statewide sage-grouse populations than leks with lesser attendance.

Mammals

Alternative WYCO-F crosses the southwestern edge of the Shirley Basin black-footed ferret management area (MV-10a). Habitats crossed in the management area are rugged terrain and, at this time, support low densities of prairie dog towns that are an essential component of black-footed ferret habitat. Due to the disperse nature of prairie dog towns, the area in the Shirley Basin black-footed ferret management area potentially affected by Alternative WYCO-F is unlikely to support black-footed ferret. Alternative WYCO-F in Wyoming crosses the same extent of the Shirley Basin black-footed ferret management area (Table 3-105) as Alternatives WYCO-B and WYCO-C and comparably more than Alternative WYCO-D.

Potentially suitable white-tailed prairie dog colonies and pygmy rabbit habitat are present along the majority of Alternative WYCO-F in Wyoming. If present in the right-of-way, injury of white-tailed prairie dogs and pygmy rabbits could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog potential colonies and pygmy rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4.

The magnitude of effects of Alternative WYCO-B on white-tailed prairie dog potential colonies and pygmy rabbit habitat could be less, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure. Alternative WYCO-F crosses the same extent of pygmy rabbit potential habitat as Alternative WYCO–D and considerably more than Alternatives WYCO-B and WYCO-C (Table 3-109). Alternative WYCO-F in Wyoming crosses the same extent of white-tailed prairie dog potential colonies as Alternative WYCO-B, more than Alternative WYCO-C, and less than Alternative WYCO-D (Table 3-109).

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

The environmental consequences for Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Wyoming are the same as Alternative WYCO-F, as they follow the same alignment.

Affected Environment (Colorado)

The affected environment for Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado is the same as Alternative WYCO-B and its variations (Table 3-105), as the two routes follow the same alignment through the state. Slight differences occur in the number of miles of mountain plover, pygmy rabbit, white-tailed prairie dog, and yellow-billed cuckoo potential habitat as well as habitat within 4 miles of sage-grouse leks located in general and priority habitats crossed by Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado (Table 3-105).

Environmental Consequences (Colorado)

Alternative WYCO-F

The environmental consequences for Alternative WYCO-F in Colorado would be the same as Alternative WYCO-B (Tables 3-105 and 3-108) as the two routes follow the same alignment.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Slight differences occur in the extent of disturbance (in acres) to mountain plover, pygmy rabbit, yellow-billed cuckoo, and white-tailed prairie dog potential habitats as well as sage-grouse leks in core areas and non-core areas and general and priority habitats between Alternative WYCO-F and Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado (Table 3-109).

In the Tuttle Ranch Conservation Easement area, Alternative WYCO-F and Route Variations WYCO-F-1 and WYCO-F-3 cross the Tuttle Ranch Conservation Easement and would have the greatest impacts on sage-grouse habitats and white-tailed prairie dog potential colonies (Table 3-109). Route Variation WYCO-F-2 avoids the Tuttle Ranch Conservation Easement area and would have less impact on sage-grouse habitats and white-tailed prairie dog potential colonies (Table 3-109).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Environmental Setting

The COUT BAX alternative routes are located in the Colorado Plateau, Wasatch and Uinta Mountains, and Central Basin and Range Ecoregions. Vegetation communities crossed by COUT BAX alternative routes in Colorado and eastern Utah are dominated by grasslands, shrub/shrub-steppe, big sagebrush, pinyon-juniper, barren/sparsely vegetated, developed/disturbed; in central Utah vegetation types crossed are dominated by pinyon-juniper, big sagebrush, agriculture, montane forest, aspen, and mountain shrub. Areas disturbed by previous human activities are concentrated near the communities of Rangely and Mack in Colorado and Green River, Cisco, Huntington, Fountain Green, Fairview, and Mona in Utah (MV-10b, MV-11b, and MV-12b).

All of the COUT BAX alternative routes begin along U.S. Highway 40 in Colorado and end at the Clover Substation near Mona, Utah. The alternative routes all follow the same geographic path south along the Colorado/Utah border crossing, Baxter Pass, and generally follow I-70 west to Green River, Utah. From Green River, the alternative routes follow various paths across the San Rafael Swell, Manti-La Sal National Forest, and Sanpete Valley before terminating at the Clover Substation. A detailed description of the vegetation communities crossed by the COUT BAX alternative routes and their existing condition is included in Section 3.2.7.

Special status wildlife species known to occur or which may occur in the vegetation communities crossed by the COUT BAX alternative routes include the black-footed ferret, sage-grouse, Mexican spotted owl, white-tailed prairie dog, yellow-billed cuckoo, southwestern willow flycatcher, mountain plover, and other species (including but not limited to burrowing owl and kit fox) described in Appendix E, Section E.5. The COUT BAX alternative routes cross designated sage-grouse general habitats in western Colorado as well as designated occupied, brood rearing, and wintering sage-grouse habitats in Carbon, Emery, and Sanpete counties of Utah. Sage-grouse habitats crossed by the COUT BAX alternative routes in Utah include habitats used by the Horn Mountain sage-grouse population and designated sage-grouse habitats that do not currently support a known sage-grouse population. The Horn Mountain sage-grouse population is located in the Emery sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013) and the Parker Mountain-Emery Sage-grouse Management Area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

All of the COUT BAX alternative routes cross the southwest corner of the Wolf Creek black-footed ferret reintroduction management area in Colorado. Reintroduced ferrets in the Wolf Creek management area are believed to have been lost to a plague event in 2008 and 2009 and ferrets have not been reintroduced since (Ausmus 2012). Mexican spotted owls are uncommon in western Colorado and are not known to occupy potential habitat crossed by the COUT BAX alternative routes along Whiskey and Salt Creek canyons in Garfield County, Colorado. Incidental reports of Mexican spotted owls have been reported from the San Rafael Swell in the vicinity of the Wedge (Wright 2012) and the type of incised canyon habitat occupied by spotted owls is present in the Project area in the San Rafael Swell (FWS 2011h). However, no formal surveys have been completed.

White-tailed prairie dogs are locally common in western Colorado and eastern Utah. Plague management, the treatment of the white-tailed prairie dog as a pest species, and habitat loss have limited the species distribution and population size. Yellow-billed cuckoos may occur in the limited riparian habitats supported by major rivers and perennial and intermittent streams throughout the Project area. Southwestern willow flycatchers may occur in the limited riparian habitats supported by major rivers and perennial and intermittent streams in Grand and Emery counties, Utah. Mountain plovers are known to use disturbed, grassland, and shrubland habitats in Colorado (Knopf and Miller 1994), though the COUT

BAX alternative routes are on the periphery of the species' breeding range and the mountain plovers are scarce in those areas (Dinsmore 2003).

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado is entirely in the Colorado Plateaus Ecoregion, which predominantly contains big sagebrush, shrub/shrub-steppe, and pinyon-juniper vegetation communities (Section 3.2.5). Smaller areas of alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, and water vegetation communities also occur along this alternative route in Colorado (Section 3.2.5). Special status wildlife species and habitats present and likely to be affected by each of the COUT alternative routes are described under Environmental Setting for the COUT BAX alternative routes.

The extent of potential habitat for special status wildlife species crossed by each COUT BAX alternative route is presented in Table 3-111.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT BAX-B, in Colorado are presented in Table 3-112. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential yellow-billed cuckoo habitat along the White River in northwest Rio Blanco County south of Hatch Flats is crossed by Alternative COUT BAX-B (MV-11b).

Potential mountain plover habitat is crossed by Alternative COUT BAX-B in Rio Blanco County before the alternative route crosses over Coal Ridge, in the Hatch Flats area, and crosses upland habitats along the White River (MV-11b).

Potential Mexican spotted owl habitat is crossed by Alternative COUT BAX-B where the alternative route follows Whiskey Creek south in Rio Blanco to Garfield County and crosses over Baxter Pass following County Road 201 south toward Mesa County (MV-11b).

TABLE 3-111
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
COUT BAX-B	279.2	1.5	10.5	0.0	0.7	19.5	0.1	0.6	10.3	14.7	0.0	0.0
Colorado	*86.7*	*1.5*	1.2	*0.0*	*0.7*	*19.1*	*0.0*	*0.0*	*0.0*	*14.7*	*0.0*	*0.0*
Utah	*192.5*	*0.0*	9.3	*0.0*	*0.0*	*0.4*	*0.1*	*0.6*	*10.3*	*0.0*	*0.0*	*0.0*
COUT BAX-C	289.7	1.5	11.6	0.0	0.7	22.9	0.6	1.1	10.3	14.7	0.0	0.0
Colorado	*86.7*	*1.5*	1.2	*0.0*	*0.7*	*19.1*	*0.0*	*0.0*	*0.0*	*14.7*	*0.0*	*0.0*
Utah	*203.0*	*0.0*	10.4	*0.0*	*0.0*	*3.8*	*0.6*	*1.1*	*10.3*	*0.0*	*0.0*	*0.0*
COUT BAX-E	291.5	1.5	8.9	0.0	0.7	19.1	0.8	1.4	19.8	14.7	0.0	0.0
Colorado	*86.7*	*1.5*	1.2	*0.0*	*0.7*	*19.1*	*0.0*	*0.0*	*0.0*	*14.7*	*0.0*	*0.0*
Utah	*204.8*	*0.0*	7.7	*0.0*	*0.0*	*0.0*	*0.8*	*1.4*	*19.8*	*0.0*	*0.0*	*0.0*

NOTES:
[1]The miles crossed for the special status mammals and birds columns will not add to the total miles column due to overlapping habitats.
[2]Designated in Wyoming Executive Order 2011-5
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources represented in this table are listed for each special status wildlife resource in Table 3-97.

TABLE 3-112
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route[1]	Columbian Sharp-Tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
	Number of Known Leks within 4 Miles of Centerline	Acres of Winter Habitat	Number of Known Nests within 1 Mile of Centerline	Number of Known Winter Roost Sites Crossed	Number of Known Nests within 0.5 Mile of Centerline	Acres of Post-fledging Areas	Number of Known Post-fledging areas within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Acres of nesting Areas	Number of Known Nests within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Number of Nests within 0.25 Mile
COUT BAX-B	0	0	0	0	2	0	0	0	34	4	17	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*34*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*4*	*17*	*1*
COUT BAX-C	0	0	0	0	2	0	0	0	34	4	17	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*34*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*4*	*17*	*1*
COUT BAX-E	0	0	0	0	0	0	0	0	34	12	17	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*34*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*12*	*17*	*1*

NOTES:
[1]Comprehensive raptor nest survey data are not currently available for all alternative routes but preconstruction surveys will be conducted along the selected alternative route and seasonal and spatial restrictions on construction and maintenance (Selective Mitigation Measure 12) would be applied to all known nests.
This table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). Zeros reported in this table do not represent absence data and dashes (-) appear where data were not available. The specific data sources represented in this table are listed for each special status wildlife resource in Table 3-97.

Special Status Upland Game Birds

In Colorado, Alternative COUT BAX-B crosses sage-grouse general habitats, but would not cross priority habitats or habitats within 4 miles of leks (Table 3-111, MV-12b). Where crossing general sage-grouse habitat south of the White River, this alternative primarily parallels existing disturbances, including high traffic unpaved roads and existing oil and gas development in areas. North of the White River, sage-grouse general habitats crossed by the alternative route, have been affected by few previous anthropogenic developments (MV-12b). The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-113. The extent of sage-grouse habitat crossed by Alternative COUT BAX-B is presented in Table 3-115.

TABLE 3-113
SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ALTERNATIVE ROUTE CENTERLINES FOR THE COLORADO TO UTAH –U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Number of Sage-grouse Leks		
	Within 2 Miles	Within 4 Miles	Within 11 Miles
COUT BAX-B	0	0	1
Colorado	*0*	*0*	*1*
Utah	*0*	*0*	*0*
COUT BAX-C	0	0	1
Colorado	*0*	*0*	*1*
Utah	*0*	*0*	*0*
COUT BAX-E	0	0	1
Colorado	*0*	*0*	*1*
Utah	*0*	*0*	*0*

NOTES:
Lek analysis incudes only leks in contiguous sage-grouse habitat crossed by each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources represented in the table are listed for each special status wildlife resource in Table 3-97.

Mammals

Alternative COUT BAX-B in Colorado crosses the Wolf Creek black-footed ferret reintroduction management area through sagebrush, grassland, and pinyon-juniper habitats along an existing transmission line and U.S. Highway 40 from Elk Springs toward Massadona (MV-10b) to the same extent as Alternatives COUT BAX-C and COUT BAX-E. Reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012).

White-tailed prairie dog potential colonies occur along Alternative COUT BAX-B in Colorado in the vicinity of U.S. Highway 40 and south of the Book Cliffs along I-70 (MV-11b).

Environmental Consequences (Colorado)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT BAX-B in Colorado and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative COUT BAX-B would be the same as other COUT alternative routes (Table 3-114; MV-10a, MV-11a, and MV-12a). In Colorado, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Wolf Creek reintroduction

management area). Moderate impacts would be primarily from impacts on potential Mexican spotted owl habitat. Low impacts would be a result of impacts on sage-grouse general habitats in transmission line corridors.

TABLE 3-114
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts[1, 2] (miles crossed)			
		Nonidentifiable[3]	Low	Moderate	High
COUT BAX-B	279.2	224.7	13.0	29.7	11.8
Colorado	*86.7*	*52.8*	*13.0*	*19.4*	*1.5*
Utah	*192.5*	*171.9*	*0.0*	*10.3*	*10.3*
COUT BAX-C	289.7	230.4	13.0	34.5	11.8
Colorado	*86.7*	*52.8*	*13.0*	*19.4*	*1.5*
Utah	*203.0*	*177.6*	*0.0*	*15.1*	*10.3*
COUT BAX-E	291.5	228.8	13.0	28.4	21.3
Colorado	*86.7*	*52.8*	*13.0*	*19.4*	*1.5*
Utah	*204.8*	*176.0*	*0.0*	*9.0*	*19.8*

NOTES:
[1]Where multiple special status wildlife resources is crossed, the resource with the highest impact-level- assignment was reported.
[2]Includes impacts on black-footed ferret, white-tailed prairie dog, pygmy rabbit, mountain plover, Mexican spotted owl, southwestern willow flycatcher, yellow-billed cuckoo, and greater sage-grouse and associated special status habitats.
[3]Miles are along the reference centerlines where none of the modeled habitats listed in the previous note occur.

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT BAX-B in Colorado is located within 1 mile of known raptor nests (Table 3-112). Additional raptor nests are likely to be located within 1 mile of Alternative COUT BAX-B. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River and the Hatch Flats area in Rio Blanco County that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats along the White River and the Hatch Flats area, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories in Rio Blanco County. Alternative COUT BAX-B would result in the same loss of potential yellow-billed cuckoo habitat as COUT BAX-C and COUT BAX-E in Colorado (Table 3-115).

Despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur as the alternative route crosses over Coal Ridge, in the Hatch Flats area, and in potentially suitable habitat in the general vicinity of the White River in Rio Blanco County (Table 3-115). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once

construction is complete. Alternative COUT BAX-B would result in modification of the same extent of potential mountain plover habitat as Alternatives COUT BAX-C and COUT BAX-E in Colorado (Table 3-115).

Mexican spotted owls are not known to occupy the potential habitat crossed in the Baxter Pass area along Whiskey and West Salt creeks in Garfield County, though no formal surveys have been completed. If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operations of the transmission line. Alternative COUT BAX-B would result in modification of the same extent of potential Mexican spotted owl habitat as Alternatives COUT BAX-C and COUT BAX-E in Colorado (Table 3-115).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT BAX-B in Colorado would occur in mapped general habitat and would not occur within 4 miles of known leks. Additionally, sage-grouse habitats affected south of the White River have been previously affected by noise, human presence, and vehicle use associated with high traffic unpaved roads and oil and gas development in the area. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated disturbance of sage-grouse core areas and the estimated area of sage-grouse habitat affected within 4 miles of leks in Colorado by Alternative COUT BAX-B are presented in Table 3-115.

Alternative COUT BAX-B does not affect priority sage-grouse habitats or sage-grouse habitats within 4 miles of known leks, which are presumably the most important areas for maintaining statewide sage-grouse populations in Colorado. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT BAX-B during the past 5 years and percentage of the average Colorado statewide sage-grouse male lek counts that this represents are presented in Table 3-116.

Mammals

Black footed-ferret occurrences have not been recorded since a 2008 and 2009 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 4 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, Alternative COUT BAX-B could result in effects described in Section 3.2.8.4. Alternative COUT BAX-B would affect the same extent of the Wolf Creek black footed ferret management area as Alternatives COUT BAX-C and COUT BAX-E in Colorado (Table 3-115).

If present in the right-of-way, injury of white-tailed prairie dogs could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. Alternative COUT BAX-B would affect the same extent of potential white-tailed prairie dog colonies as Alternatives COUT BAX-C and COUT BAX-E in Colorado (Table 3-115).

TABLE 3-115
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
COUT BAX-B	26	181	0	12	336	2	10	177	253	0	0
Colorado	*26*	21	*0*	*12*	*329*	*0*	*0*	0	*253*	*0*	*0*
Utah	*0*	160	*0*	*0*	*7*	*2*	*10*	177	*0*	*0*	*0*
COUT BAX-C	25	196	0	12	388	10	19	174	249	0	0
Colorado	*25*	20	*0*	*12*	*324*	*0*	*0*	0	*249*	*0*	*0*
Utah	*0*	176	*0*	*0*	*64*	*10*	*19*	174	*0*	*0*	*0*
COUT BAX-E	25	146	0	12	314	13	23	325	241	0	0
Colorado	*25*	20	*0*	*12*	*314*	*0*	*0*	0	*241*	*0*	*0*
Utah	*0*	126	*0*	*0*	*0*	*13*	*23*	325	*0*	*0*	*0*

NOTES:
[1]Designated in Wyoming Executive Order 2011-5
This table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area. The specific data sources of the inventories reported in this table are listed for each special status wildlife resource in Table 3-97.

TABLE 3-116
SUMMARY OF 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	5-Year Average Sage-grouse Lek Counts[1]		
	Statewide Sum	Sum within 4 miles	Percentages of Leks within 4 Miles
COUT BAX-B			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
COUT BAX-C			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
COUT BAX-E			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*

NOTES:
[1]Not all leks have been counted each year during the past 5 years and lek counts may have been conducted using different methodologies in different states. For leks without data for the past 5 consecutive years, an average of the number of counts available during the period was used. The counts are state specific and do not sum for each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Affected Environment (Utah)

Alternative COUT BAX-B in Utah occurs in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range Ecoregions. The dominant vegetation types crossed by Alternative COUT BAX-B include shrub/shrub-steppe vegetation communities, but large areas of barren/sparsely vegetated, big sagebrush, and pinyon-juniper vegetation communities (Section 3.2.5). Lesser amounts of agriculture, alpine, aspen, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, and water vegetation communities also occur (Section 3.2.5). Special status wildlife species and habitats present and likely to be affected by Alternative COUT BAX-B are described under Environmental Setting for COUT BAX alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT BAX alternative route is presented in Table 3-111.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative COUT BAX-B in Utah are presented in Table 3-112. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential yellow-billed cuckoo habitat is crossed by Alternative COUT BAX-B in Utah where the alternative route follows an existing 345kV transmission line in the Calf Mesa, Hadden Flat, Wilberg Flat areas as well as in the Hop Creek area of the Uinta National Forest in Juab County (MV-11b). A yellow-billed cuckoo was detected in 2012 at the Huntington Game Farm WMA near Huntington Creek adjacent to the alternative route (Hanson 2013).

Potential Mexican spotted owl habitat is crossed by Alternative COUT BAX-B in Utah where it follows an existing 345kV transmission line south of Dry Mesa (MV-11b). Incidental reports of Mexican spotted owl vocalizations have been reported in the vicinity of The Wedge, though no formal surveys have been completed (Wright 2012).

Potential southwestern willow flycatcher habitat is crossed by Alternative COUT BAX-B in Utah where the alternative route follows an existing 345kV transmission line in the Green River, Calf Mesa, Hadden Flat, and Wilberg Flat areas (MV-11b).

Special Status Upland Game Birds

In Utah, Alternative COUT BAX-B crosses sage-grouse occupied, brood rearing, and winter habitat on the Manti-La Sal National Forest, which supports the Horn Mountain sage-grouse population and occupied habitat in the Sanpete Valley that does not currently support a known sage-grouse population (Map 3-5). Alternative COUT BAX-B does not cross habitats located within 4 miles of known leks in Utah (Table 3-111, MV-12b). In all areas where sage-grouse habitats are crossed in Utah, Alternative COUT BAX-B would be parallel to an existing 345kV wood H-frame transmission line (MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT BAX-B is presented in Table 3-117. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-118. The specific extent of sage-grouse habitat occupied by the Horn Mountain population crossed by Alternative COUT BAX-B is presented in Table 3-117. The number of sage grouse leks within 2, 4, and 11 miles of the alternative route in the Horn Mountain population area is presented in Table 3-118.

TABLE 3-117
ALTERNATIVE ROUTE COMPARISON FOR SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

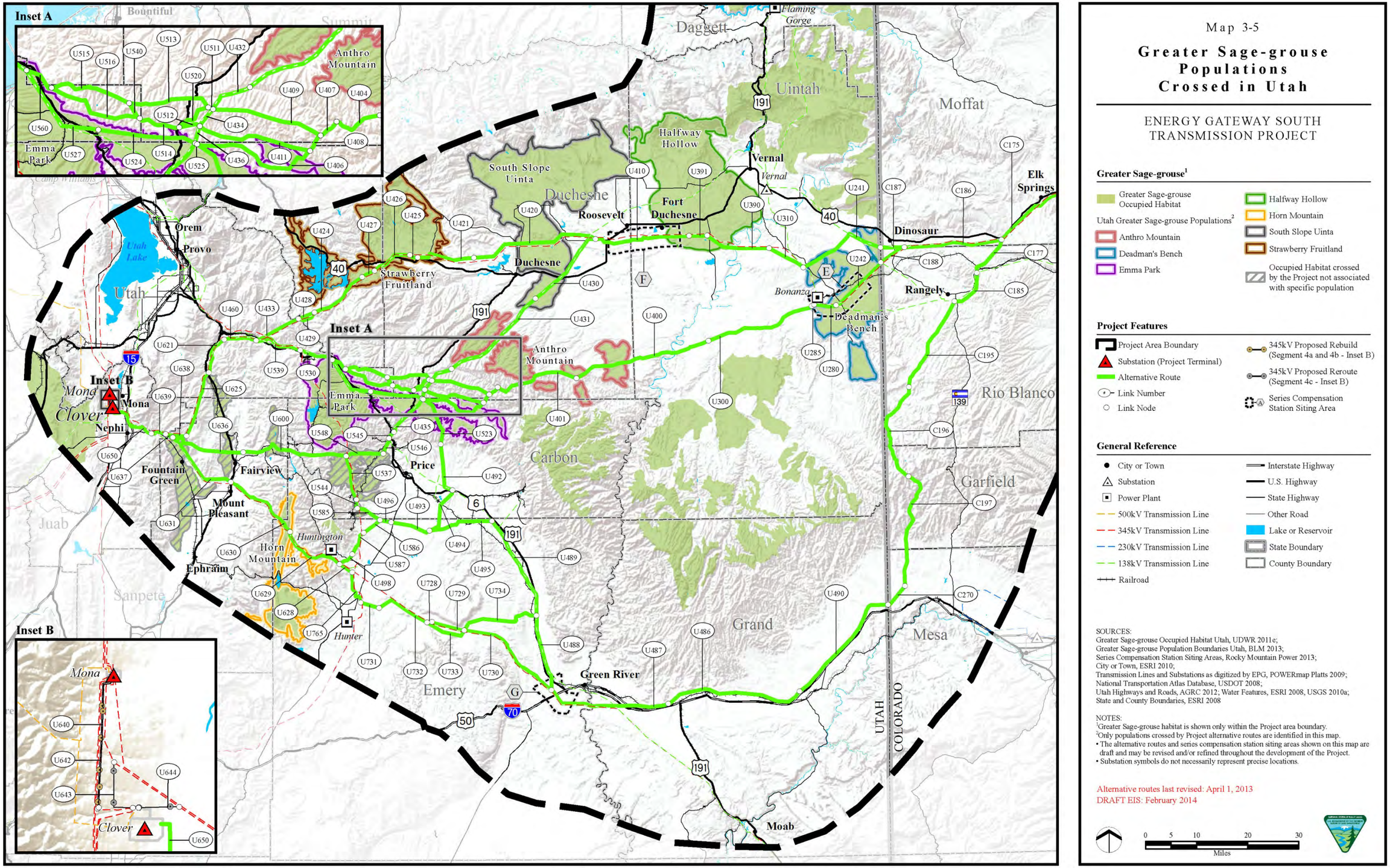
Alternative Route by the Horn Mountain Population	Sage-grouse Habitat Types	
	Miles Crossed	
	Core Areas or Priority Habitat[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat
COUT BAX-B	6.4	0.0
COUT BAX-C	6.4	0.0
COUT BAX-E	0.0	0.0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011e) was considered to be synonymous with priority habitat.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

<u>Sage-grouse Population Areas Crossed by Alternative COUT BAX-B</u>

<u>Horn Mountain</u>

The number of males counted on known leks associated with the Horn Mountain sage-grouse population is estimated to range between 1 to 18 birds based on males counted on 2 leks (UDWR 2013b) over the past 10 years. The Horn Mountain sage-grouse population occurs in the central portion of the Wasatch Plateau (Map 3-5). The population is in the Southern Great Basin: Management Zone III identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006), the greater Emery sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013), and the Parker Mountain-Emery sage-grouse management area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a). The Horn Mountain population is limited to small, high elevation sagebrush habitats (totaling 16, 817 acres) bordered by large canyons, cliffs, and mountains (Perkins 2010). The Horn Mountain sage-grouse are considered to be 'one-stage migratory,' moving 10 kilometers or more between late-summer and wintering habitat (Perkins 2010). Two leks and wintering habitats are located on the southern end of the habitat area occupied by the Horn Mountain population (BLM 2013b).


Map 3-5
Greater Sage-grouse Populations Crossed in Utah
ENERGY GATEWAY SOUTH TRANSMISSION PROJECT
Greater Sage-grouse[1]
Greater Sage-grouse Occupied Habitat
Utah Greater Sage-grouse Populations[2]
Anthro Mountain
Deadman's Bench
Emma Park
Halfway Hollow
Horn Mountain
South Slope Uinta
Strawberry Fruitland
Occupied Habitat crossed by the Project not associated with specific population
Project Features
Project Area Boundary
Substation (Project Terminal)
Alternative Route
Link Number
Link Node
345kV Proposed Rebuild (Segment 4a and 4b - Inset B)
345kV Proposed Reroute (Segment 4c - Inset B)
Series Compensation Station Siting Area
General Reference
City or Town
Substation
Power Plant
500kV Transmission Line
345kV Transmission Line
230kV Transmission Line
138kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Other Road
Lake or Reservoir
State Boundary
County Boundary
SOURCES:
Greater Sage-grouse Occupied Habitat Utah, UDWR 2011e;
Greater Sage-grouse Population Boundaries Utah, BLM 2013;
Series Compensation Station Siting Areas, Rocky Mountain Power 2013;
City or Town, ESRI 2010;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
National Transportation Atlas Database, USDOT 2008;
Utah Highways and Roads, AGRC 2012; Water Features, ESRI 2008, USGS 2010a;
State and County Boundaries, ESRI 2008
NOTES:
[1]Greater Sage-grouse habitat is shown only within the Project area boundary.
[2]Only populations crossed by Project alternative routes are identified in this map.
• The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
• Substation symbols do not necessarily represent precise locations.
Alternative routes last revised: April 1, 2013
DRAFT EIS: February 2014
0 5 10 20 30
Miles
Inset A
Inset B
Bountiful
Summit
Daggett
Flaming Gorge
Uintah
Moffat
Anthro Mountain
Emma Park
Halfway Hollow
South Slope Uinta
Duchesne
Roosevelt
Fort Duchesne
Vernal
Elk Springs
Dinosaur
Rangely
Bonanza
Deadman's Bench
Rio Blanco
Orem
Provo
Utah Lake
Utah
Strawberry Fruitland
Mona
Nephi
Clover
Fountain Green
Fairview
Mount Pleasant
Ephraim
Huntington
Horn Mountain
Hunter
Price
Carbon
Juab
Sanpete
Emery
Green River
Grand
Garfield
Mesa
Moab
UTAH
COLORADO

Due to the small habitat areas, geographic isolation, small population size, and low genetic diversity; the Horn Mountain population is more susceptible to random events and lacks general resiliency (BLM 2013b). Therefore, small impacts may have proportionately larger or amplified impacts on this sage-grouse population and the population is considered to be "at-risk" (FWS 2013).

Mammals

Potential white-tailed prairie dog colonies are crossed by Alternative COUT BAX-B in Utah where the alternative route follows I-70 southwest into Grand County through existing gas and oil fields toward Cisco as well as in the Buckhorn Flat area in an existing transmission line corridor before crossing into USFS-administered land into East Mountain (MV-11b).

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT BAX-B in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT BAX-B would be similar to Alternative COUT BAX-C (Table 3-114; MV-10a, MV-11a, and MV-12a). In Utah, high residual impacts on special status wildlife resources would be due to impacts on sage-grouse priority habitats. Moderate impacts would be primarily from impacts on potential white-tailed prairie dog colonies and potential Mexican spotted owl habitat. Alternative COUT BAX-B would have the same amount of high residual impacts as Alternative COUT BAX-C, and similar moderate residual impacts as other COUT BAX routes in Utah (Table 3-114).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT BAX-B in Utah is located within 1 mile of known raptor nests (Table 3-112). Additional raptor nests are likely to be located within 1 mile of Alternative COUT BAX-B. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the Green River, Cottonwood Spring, Huntington Creek, Wilberg Flat, and Hop Creek areas that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. A yellow-billed cuckoo was detected in 2012 at the Huntington Game Farm WMA near Huntington Creek adjacent to the alternative route (Hanson 2013). If yellow-billed cuckoos use riparian habitats affected by Alternative COUT BAX-B, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along Cottonwood Spring, Huntington Creek, the Green River, Wilberg Flat, and Hop Creek areas in Emery County. Alternative COUT BAX-B would result in less loss of potential yellow-billed cuckoo habitat than Alternatives COUT BAX-C and COUT BAX-E in Utah (Table 3-115).

TABLE 3-118
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Horn Mountain											
COUT BAX-B	2	9	0	0	0	0	0	0	0	0	0
COUT BAX-C	2	9	0	0	0	0	0	0	0	0	0
COUT BAX-E	2	9	0	0	0	0	0	0	0	0	0
Emma Park											
COUT BAX-E	13	137	0	0	0	0	0	0	0	0	0

NOTE:
Lek analysis incudes only leks in contiguous sage-grouse habitat crossed by each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Potential habitat for Mexican spotted owl is crossed by Alternative COUT BAX-B north of Buckhorn Wash. Incidental reports of Mexican spotted owl vocalizations have been reported in the vicinity of The Wedge, though no formal surveys have been completed (Wright 2012). If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operation of the transmission line. Alternative COUT BAX-B would result in modification of the same extent of potential Mexican spotted owl habitat as Alternatives COUT BAX-C and more than Alternative COUT BAX-E in Utah (Table 3-115).

Despite the implementation of temporal and spatial avoidance mitigation measures, some loss of riparian vegetation along Cottonwood Spring, Huntington Creek, and Wilberg Flat areas that may provide suitable habitat for southwestern willow flycatcher could occur. Loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the amount of effective southwestern willow flycatcher territories along Cottonwood Spring, Huntington Creek, and Wilberg Flat areas in Emery County. Alternative COUT BAX-B would result in modification of considerably less potential southwestern willow flycatcher habitat than Alternatives COUT BAX-C and COUT BAX-E in Utah (Table 3-115).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT BAX-B in Utah would occur in mapped occupied, brood rearing, and winter habitats and would not occur within 4 miles of known leks. Additionally, sage-grouse habitats affected in Utah have been previously affected by construction of high-voltage transmission lines. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse habitat affected statewide by Alternative COUT BAX-B is presented in Table 3-115 and the extent of habitat affected in each Utah population crossed is presented in Table 3-119.

TABLE 3-119
ALTERNATIVE ROUTE COMPARISON FOR SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route by the Horn Mountain Population	Sage-grouse Habitat Types	
	Acres Affected	
	Core Areas or Priority Habitat[1]	Habitat within 4 Miles of Leks Located in Core Areas or priority Habitat
COUT BAX-B	110	0
COUT BAX-C	108	0
COUT BAX-E	0	0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011e) was considered to be synonymous with priority habitat.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Alternative COUT BAX-B does not affect priority sage-grouse habitats or sage-grouse habitats within 4 miles of known leks used by the Horn Mountain sage-grouse population or other sage-grouse habitats crossed in Utah. Habitats used by the Horn Mountain population that would be affected are in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-

grouse populations and habitats (State of Utah). The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT BAX-B during the past 5 years and percentage of the average Utah statewide sage-grouse male lek counts that this represents is presented in Table 3-116. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT BAX-B in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-118.

Mammals

Alternative COUT BAX-B crosses more potential white-tailed prairie dog potential colonies than Alternative COUT BAX-E and less than Alternative COUT BAX-C in Utah. Potentially suitable white-tailed prairie dog potential colonies are present along the length of all the COUT BAX alternative routes throughout Utah from Utah/Colorado border to the Manti-La Sal National Forest and injury of white-tailed prairie dogs and loss and modification of their habitats are likely to occur. White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT BAX-B on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-B would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT BAX-C

Affected Environment (Colorado)

The affected environment for Alternative COUT BAX-C in Colorado is the same as Alternative COUT BAX-B (Table 3-111) as the two routes follow the same alignment though the Rio Blanco, Garfield, and Mesa counties.

Environmental Consequences (Colorado)

The environmental consequences for Alternative COUT BAX-C in Colorado would be the same as Alternative COUT BAX-B (Tables 3-111 and 3-114) as the two routes follow the same alignment through Rio Blanco, Garfield, and Mesa counties.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah occurs in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions. This dominant vegetation types crossed by Alternative COUT BAX-C include shrub/shrub-steppe vegetation communities and large areas of barren/sparsely vegetated,

big sagebrush, and pinyon-juniper vegetation communities also occur (Section 3.2.5). Lesser amounts of agriculture, alpine, aspen, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, and water vegetation communities are dispersed throughout this alternative route (Section 3.2.5). Special status wildlife species and habitats present and likely to be affected by Alternative COUT BAX-C are described under Environmental Setting for the COUT BAX alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT BAX alternative route is presented in Table 3-115.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests located within 1 mile of Alternative COUT BAX-C in Utah are presented in Table 3-112. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential yellow-billed cuckoo habitat is crossed by Alternative COUT BAX-C in Utah where the alternative route follows U.S. Highway 6 and an existing 138kV transmission line corridor north toward Woodside (MV-11b). Alternative COUT BAX-C also affects potential yellow-billed cuckoo habitat at the Black Hills and Wilberg Flat areas along the existing power lines before crossing into USFS lands. A yellow-billed cuckoo was detected in 2012 at the Huntington Game Farm WMA near Huntington Creek adjacent to the alternative route (Hanson 2013).

Potential Mexican spotted owl habitat is crossed by Alternative COUT BAX-C in Utah at the Dry Mesa and Big Flat areas along County Road 401 before merging with the 345kV transmission line corridor at the Buckhorn Flat area (MV-11b). Incidental reports of Mexican spotted owl vocalizations have been reported in the vicinity of The Wedge, though no formal surveys have been completed (Wright 2012).

Potential southwestern willow flycatcher habitat is crossed by Alternative COUT BAX-C in Utah where the alternative route follows U.S. Highway 6 and an existing 138kV transmission line corridor north toward Woodside (MV-11b). Alternative COUT BAX-C also affects southwestern willow flycatcher habitat at the Black Hills and Wilberg Flat areas along the existing power lines before crossing into USFS-administered land.

Special Status Upland Game Birds

Sage-grouse habitats crossed by Alternative COUT BAX-C in Utah would be the same as Alternative COUT BAX-B (Table 3-111) as the two routes follow the same alignment.

The sage-grouse population areas crossed by Alternative COUT BAX-C are the same as those described for Alternative COUT BAX-B.

Mammals

Potential white-tailed prairie dog colonies are crossed by Alternative COUT BAX-C in Utah where the alternative route follows I-70 southwest into Grand County through existing gas and oil fields toward Cisco as well as in the area northwest of Calf Canyon and the Buckhorn Flat area in an existing transmission line corridor before crossing into USFS land into East Mountain (MV-11b).

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT BAX-C in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT BAX-C would be similar to Alternative COUT BAX-B (Table 3-114; MV-10a, MV-11a, and MV-12a). The resources contributing to the high, moderate, and low impacts are the same for Alternative COUT BAX-C as Alternative COUT BAX-B. Alternative COUT BAX-C would have the same amount of high residual impacts as Alternative COUT BAX-B, and similar moderate residual impacts as other COUT BAX routes in Utah.

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT BAX-C in Utah is located within 1 mile of known raptor nests (Table 3-112). Additional raptor nests are likely to be located within 1 mile of Alternative COUT BAX-C. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the Saleratus Wash in the Green River area, Huntington Creek, and Wilberg Flat areas that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT BAX-C, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the Green River, Huntington Creek, and the Wilberg Flat. Alternative COUT BAX-C would result in less loss of potential yellow-billed cuckoo habitat than Alternative COUT BAX-E and more than Alternative COUT BAX-B in Utah (Table 3-115).

Potential habitat for Mexican spotted owl is crossed by Alternative COUT BAX-C north of Buckhorn Wash. Incidental reports of Mexican spotted owl vocalizations have been reported in the vicinity of The Wedge, though no formal surveys have been completed (Wright 2012). If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operation of the transmission line. Alternative COUT BAX-C would result in modification of considerably more potential Mexican spotted owl habitat than Alternatives COUT BAX-B and COUT BAX-E in Utah (Table 3-115).

Despite the implementation of temporal and spatial avoidance mitigation measures, some loss of riparian vegetation along Saleratus Wash in the Green River area, Huntington Creek, and Wilberg Flat areas that may provide suitable habitat for southwestern willow flycatcher could occur. Loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the amount of effective southwestern willow flycatcher territories along Saleratus Wash in the Green River area, Huntington Creek, Wilberg Flat areas in Emery County. Alternative COUT BAX-C would result in modification of more potential southwestern willow flycatcher habitat than Alternative COUT BAX-B and less than Alternative COUT BAX-E in Utah (Table 3-115).

Special Status Upland Game Birds

The effects of Alternative COUT BAX-C on sage-grouse in Utah would be the same as Alternative COUT BAX-B (Tables 3-111 and 3-114) as the two routes follow the same alignment through sage-grouse habitat in Utah.

Mammals

Alternative COUT BAX-C crosses more potential white-tailed prairie dog potential colonies than Alternative COUT BAX-B and considerably more than Alternative COUT BAX-E in Utah. Potentially suitable white-tailed prairie dog potential colonies are present along the length of all the COUT BAX alternative routes throughout Utah from Utah/Colorado border to the Manti-La Sal National Forest and injury of white-tailed prairie dogs and loss and modification of their habitats are likely to occur. White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT BAX-C on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-C would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT BAX-E

Affected Environment (Colorado)

The affected environment for Alternative COUT BAX-E in Colorado is the same as Alternative COUT BAX-B (Table 3-111) as the two routes follow the same alignment though the Rio Blanco, Garfield, and Mesa counties.

Environmental Consequences (Colorado)

The environmental consequences for Alternative COUT BAX-E in Colorado would be the same as Alternative COUT BAX-B (Table 3-111 and Table 3-114) as the two routes follow the same alignment through the Rio Blanco, Garfield, and Mesa counties.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah occurs in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions. The vegetation communities crossed by Alternative COUT BAX-E include shrub/shrub-steppe and large areas of barren/sparsely vegetated, big sagebrush, and pinyon-juniper (Section 3.2.5). Lesser amounts of agriculture, alpine, aspen, developed/disturbed, grassland,

invasive, montane forest, mountain shrub, riparian, and water vegetation communities are dispersed throughout this alternative route (Section 3.2.5). Special status wildlife species and habitats present and likely to be affected by Alternative COUT BAX-E are described in the Environmental Setting for the COUT BAX alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT BAX alternative route is presented in Table 3-115.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT BAX-E, in Utah are presented in Table 3-112. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential yellow-billed cuckoo habitat is crossed by Alternative COUT BAX-E in Utah where the alternative route follows U.S. Highway 6 along an existing 138kV transmission line corridor at the Gunnison Valley area, at the Lower Price River intersection in the Woodside area, at the intersection of the Price River tributaries along the Carbon/Emery County border south of Clark Valley, and in the Rocky Ridge area north of the Manti-La Sal National Forest boundary at intersection with Salt Creek along Utah State Route 132 and an existing transmission line corridor (MV-11b). A yellow-billed cuckoo was detected in 2012 at the Huntington Game Farm WMA near Huntington Creek adjacent to the alternative route (Hanson 2013).

Potential southwestern willow flycatcher habitat is crossed by Alternative COUT BAX-E in Utah where the alternative route follows U.S. Highway 6 north along an existing 138kV transmission line corridor at the Green Valley area, Gunnison Valley area, at the Lower Price River intersection in the Woodside area, and at the intersections of the Price River tributaries along the Carbon/Emery County border south of Clark Valley (MV-11b).

Special Status Upland Game Birds

In Utah, Alternative COUT BAX-E crosses sage-grouse occupied and brood rearing habitat. Occupied habitats are crossed west of Price where the alternative is parallel to an existing high-voltage transmission line and some of these habitats have been affected by previous oil and gas development. Occupied and brood rearing habitats are crossed in the vicinity of Utah State Route 264, at the Slick Hills Hollow area on the Manti-La Sal National Forest. Finally, occupied habitats are crossed in the Sanpete Valley north west of Fairview in an area that has been converted to agricultural development. Alternative COUT BAX-E does not cross habitats located within 4 miles of known leks in Utah (Table 3-111, MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT BAX-E is presented in Table 3-115. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-113.

Mammals

Potential white-tailed prairie dog colonies are crossed by Alternative COUT BAX-E in Utah where the alternative route follows I-70 southwest into Grand County through existing gas and oil fields toward Cisco (MV-10b). Alternative COUT BAX-E crosses potential white-tailed prairie dog colonies where the alternative travels north toward Cedar south of Woodside and just south of the Carbon/Emery County border north of Cedar City.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT BAX-E in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT BAX-E would be greater than other COUT BAX alternative routes (Table 3-114; MV-10a, MV-11a, and MV-12a). The resources contributing to high, moderate, and low impacts are the same for Alternative COUT BAX-E as COUT BAX-B and COUT BAX-C. Alternative COUT BAX-E would have the most high residual impacts of the COUT BAX alternative routes and similar moderate residual impacts as other COUT BAX routes in Utah (Table 3-114).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT BAX-E in Utah is located within 1 mile of known raptor nests (Table 3-112). Additional raptor nests are likely to be located within 1 mile of Alternative COUT BAX-E. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along Saleratus Wash in the Green River area, Lower Price River, Cottonwood Creek, and Price River tributaries along the Carbon/Emery County border that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. A yellow-billed cuckoo was detected in 2012 at the Huntington Game Farm WMA near Huntington Creek adjacent to the alternative route (Hanson 2013). If yellow-billed cuckoos use riparian habitats affected by Alternative COUT BAX-E, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along Saleratus Wash in the Green River area, the Price River, and Cottonwood Creek in Carbon and Emery counties. Alternative COUT BAX-E would result in more loss of potential yellow-billed cuckoo habitat than Alternatives COUT BAX-B and COUT BAX-C in Utah (Table 3-115).

Despite the implementation of temporal and spatial avoidance mitigation measures, some loss of riparian vegetation along Saleratus Wash, the Green River, the Lower Price River and tributaries to the Price River along the Carbon/Emery County border that may provide suitable habitat for southwestern willow flycatcher could occur. Loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the amount of effective southwestern willow flycatcher territories along Saleratus Wash, the Green River, the Price River, and Cottonwood Creek in Carbon and Emery counties. Alternative COUT BAX-E would result in modification of more potential southwestern willow flycatcher habitat than Alternatives COUT BAX-B and COUT BAX-C in Utah (Table 3-115).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT BAX-E in Utah would occur in mapped general habitat and would not occur within 4 miles of known leks. Additionally, sage-grouse habitats crossed have previously been affected by construction of high-voltage transmission lines, oil and gas development, state highways, and agricultural development. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of

minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse general habitat affected in Utah by Alternative COUT BAX-E is presented in Table 3-115. The estimated area of sage-grouse occupied habitat as well as the estimated area of sage-grouse habitat affected within 4 miles of leks in Utah for each sage-grouse population (BLM 2013b) by Alternative COUT BAX-E is presented in Table 3-117.

Mammals

Alternative COUT BAX-E crosses less potential white-tailed prairie dog colonies than Alternative COUT BAX-B and considerably less than Alternative COUT BAX-C in Utah. Potentially suitable white-tailed prairie dog potential colonies are present along the length of the alternative route from the Utah/Colorado border to the Manti-La Sal National Forest, disturbance to white-tailed prairie dogs and associated colonies could occur. White-tailed prairie dog rabbit habitats adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT BAX-E on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-E would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest wide population trends for all MIS species in the Project area.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Environmental Setting

The COUT alternative routes are located in the Colorado Plateau, Wasatch and Uinta mountains, and Central Basin and Range Ecoregions. Vegetation communities crossed by the COUT alternative routes in Colorado and eastern Utah's Uinta Basin are dominated by shrub/shrub-steppe, big sagebrush, barren, invasive, and pinyon-juniper habitats; in central Utah habitat types crossed are dominated by pinyon-juniper, big sagebrush, agriculture, montane forest, aspen, and mountain shrub. Agricultural areas and areas disturbed by previous human activities are concentrated near the cities of Roosevelt, Vernal, Helper, Price, Wellington, and Nephi (Section 3.2.5.4; MV-10b, MV-11b, and MV-11b).

All of the COUT alternative routes begin along U.S. Highway 40 in Colorado and end at the Clover Substation near Mona, Utah. The alternative routes cross the Uinta Basin using one of two paths before following various paths across the Ashley, Uinta, and/or Manti-La Sal National Forests and the Sanpete Valley, terminating at the Clover Substation. A detailed description of the vegetation communities crossed by the COUT alternative routes and their existing condition is included in Environmental Setting in Section 3.2.6 for the COUT alternative routes.

Special status wildlife species known to occur or may occur in the potentially suitable habitats crossed by the COUT alternative routes include black-footed ferret, sage-grouse, Mexican spotted owl, white-tailed

prairie dog, yellow-billed cuckoo, mountain plover, and other species (including but not limited to burrowing owl) described in Appendix E, Section E.5. The COUT alternative routes cross designated sage-grouse general habitats in western Colorado as well as designated occupied, brood rearing, and wintering sage-grouse habitats in Utah. Habitats within 4 miles of sage-grouse leks, and localized areas of relatively higher population densities (e.g., Emma Park) are crossed in Utah (Doherty et al. 2010). Sage-grouse habitats crossed by the COUT alternative routes in Utah include habitats used by the Emma Park, Anthro Mountain, Strawberry/Fruitland, South Slope Uinta, Horn Mountain, Halfway Hollow, and Deadman's Bench sage-grouse populations. UDWR-designated sage-grouse habitats that do not currently support a known population are also crossed. Sage-grouse populations and habitats crossed in Utah are in the Carbon, Strawberry Valley, Uintah, and Emery sage-grouse management areas identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013) and the Parker Mountain-Emery, Carbon, Strawberry, and Uintah Sage-grouse Management Areas identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

All of the COUT alternative routes cross the southwest corner of the Wolf Creek black-footed ferret reintroduction management area in Colorado and either the Coyote Basin or Snake John Reef reintroduction management areas in Utah. Reintroduced ferrets in the Wolf Creek management area are believed to have been lost to a plague event in 2008 and 2009 and ferrets have not been reintroduced since (Ausmus 2012). Black-footed ferret reintroductions are ongoing in the Snake John Reef and Coyote Basin reintroduction management areas in Utah, and ferrets are likely to occur in these areas. Mexican spotted owl potential habitat occurs in the Argyle Canyon area and is crossed by some of the COUT alternative routes. BLM has conducted surveys for Mexican spotted owls in the Argyle Canyon area, and the Coal Creek area south of the roan Cliffs in Carbon County and no owls have been detected (McDonald and Emmett 2012; Wright 2012). However, surveys that have been performed did not encompass all of the potential Mexican spotted owl habitats crossed. White-tailed prairie dogs are locally common in northwestern Colorado and eastern Utah; though plague, management as a pest species, and habitat loss has limited the species distribution and population size. Yellow-billed cuckoos may occur in the limited riparian habitats supported by major rivers and perennial and intermittent streams throughout the Project area. Mountain plovers are known to use disturbed, grassland, and shrubland habitats in Colorado and Utah (Bosworth 2003; Knopf and Miller 1994), though the COUT alternative routes are on the periphery of the species' breeding range and the mountain plovers are scarce in these areas (Dinsmore 2003). The breeding population of mountain plovers in Utah is very small and may have been extirpated (Bosworth 2003).

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A and Route Variation COUT-A-1 in Colorado follow the same geographic corridor. Both Alternative COUT-A and Route Variation COUT-A-1 are entirely in the Colorado Plateaus Ecoregion, which is predominantly big sagebrush communities (Section 3.2.5). Smaller areas of barren/sparsely vegetated, invasive, pinyon-juniper, and shrub-steppe vegetation communities also occur along this alternative route in Colorado. Special status wildlife species and habitats present and likely to be affected by this alternative route are described in Environmental Setting for the COUT alternative routes.

The extent of potential habitat for each special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-A and Route Variation COUT-A-1 in Colorado are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

If selected, Alternative COUT-A in Colorado could require construction in buffer areas around active raptor nests closed to construction activities year-round by a CSU stipulation in the BLM White River Field Office RMP that requires year-round spatial buffers for active raptor nests. However, exceptions to the BLM-determined buffer distances can be granted by the BLM Field Office manager depending on species, nest activity, natural topographic barriers, and construction line-of-sight distances. If an exception or modification is granted, the Applicant may be required to monitor the site for up to 5 years post construction.

Potential mountain plover habitat occurs throughout the majority of the length of Alternative COUT-A and Route Variation COUT-A-1 from Massadona to Myton Bench area in Duchesne County (MV-11b). Mountain plovers are not known to use the majority of the potential habitat crossed.

Special Status Upland Game Birds

In Colorado, Alternative COUT-A and Route Variation COUT-A-1 cross sage-grouse general habitats, but do not cross priority habitats or habitats within 4 miles of leks (Table 3-120, MV-12b). The alternative is parallel to existing high-voltage transmission lines and a paved highway (MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT-A and Route Variation COUT-A-1 is presented in Table 3-120. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-122.

Colorado Sage-grouse Populations Crossed by Alternative COUT-A and Route Variation COUT-A-1

Northwest Colorado

Alternative COUT-A and Route Variation COUT-A-1 cross sage-grouse habitat in Management Zones 9 and 10 (Map 3-4). Descriptions of sage-grouse habitats crossed in Management Zone 9 (Sagebrush Draw, the U.S. Highway 40 corridor, and Indian Valley) and Management Zone 10 (Crooked Wash and the U.S. Highway 40 corridor) are provided above for Alternative WYCO-B.

Mammals

Alternative COUT-A and Route Variation COUT-A-1 affect the Wolf Creek black-footed ferret reintroduction management area through sagebrush, grassland, and pinyon-juniper habitats following an existing transmission line and U.S. Highway 40 from Elk Springs toward Massadona (MV-10b). Reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012).

Alternative COUT-A and Route Variation COUT-A-1 cross potential white-tailed prairie dog colonies from Massadona to the Colorado/Utah border along the existing U.S. Highway 40 disturbance corridor (MV-11b).

TABLE 3-120
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
Alternative COUT-A and Route Variation												
COUT-A	206.0	5.9	*14.0*	0.0	17.5	0.0	0.0	3.1	49.7	20.8	29.2	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*182.0*	*4.8*	*7.2*	*0.0*	*12.8*	*0.0*	*0.0*	*3.1*	*49.7*	*0.0*	*29.2*	*0.0*
COUT-A-1	205.6	5.9	*14.0*	0.0	17.5	0.0	0.0	3.1	49.7	20.8	29.2	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*181.6*	*4.8*	*7.2*	*0.0*	*12.8*	*0.0*	*0.0*	*3.1*	*49.7*	*0.0*	*29.2*	*0.0*
Alternative COUT-B and Route Variations												
COUT-B	216.0	5.9	*15.1*	0.0	20.5	9.6	0.0	2.9	52.0	20.8	23.5	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*192.0*	*4.8*	*8.3*	*0.0*	*15.8*	*9.6*	*0.0*	*2.9*	*52.0*	*0.0*	*23.5*	*0.0*
COUT-B-1	212.7	5.9	*14.3*	0.0	20.5	7.4	0.0	2.7	33.5	20.8	5.9	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*188.7*	*4.8*	*7.5*	*0.0*	*15.8*	*7.4*	*0.0*	*2.7*	*33.5*	*0.0*	*5.9*	*0.0*
COUT-B-2	214.2	5.9	*14.3*	0.0	20.5	8.5	0.0	2.7	33.5	20.8	5.9	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*190.2*	*4.8*	*7.5*	*0.0*	*15.8*	*8.5*	*0.0*	*2.7*	*33.5*	*0.0*	*5.9*	*0.0*
COUT-B-3	213.9	5.9	*14.3*	0.0	20.5	9.7	0.0	2.7	33.5	20.8	5.9	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*189.9*	*4.8*	*7.5*	*0.0*	*15.8*	*9.7*	*0.0*	*2.7*	*33.5*	*0.0*	*5.9*	*0.0*
COUT-B-4	214.2	5.9	*14.3*	0.0	20.5	9.7	0.0	2.7	33.5	20.8	5.9	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*190.2*	*4.8*	*7.5*	*0.0*	*15.8*	*9.7*	*0.0*	*2.7*	*33.5*	*0.0*	*5.9*	*0.0*
COUT-B-5	213.9	5.9	*14.3*	0.0	20.5	8.5	0.0	2.7	33.5	20.8	5.9	0.0
Colorado	*24.0*	*1.1*	*6.8*	*0.0*	*4.7*	*0.0*	*0.0*	*0.0*	*0.0*	*20.8*	*0.0*	*0.0*
Utah	*189.9*	*4.8*	*7.5*	*0.0*	*15.8*	*8.5*	*0.0*	*2.7*	*33.5*	*0.0*	*5.9*	*0.0*

TABLE 3-120
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
Alternative COUT-C and Route Variations												
COUT-C	209.8	8.0	*11.5*	0.0	30.6	9.6	0.0	0.9	44.4	21.6	23.5	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*185.0*	*6.9*	*6.0*	*0.0*	*27.3*	*9.6*	*0.0*	*0.9*	*44.4*	*0.0*	*23.5*	*0.0*
COUT-C-1	206.4	8.0	*10.7*	0.0	30.6	10.7	0.0	0.7	22.9	21.6	4.3	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*181.6*	*6.9*	*5.2*	*0.0*	*27.3*	*10.7*	*0.0*	*0.7*	*22.9*	*0.0*	*4.3*	*0.0*
COUT-C-2	207.9	8.0	*10.7*	0.0	30.6	11.8	0.0	0.7	22.9	21.6	4.3	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*183.1*	*6.9*	*5.2*	*0.0*	*27.3*	*11.8*	*0.0*	*0.7*	*22.9*	*0.0*	*4.3*	*0.0*
COUT-C-3 (Agency Preferred Alternative)	207.6	8.0	*10.7*	0.0	30.6	11.8	0.0	0.7	22.9	21.6	4.3	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*182.8*	*6.9*	*5.2*	*0.0*	*27.3*	*11.8*	*0.0*	*0.7*	*22.9*	*0.0*	*4.3*	*0.0*
COUT-C-4	207.9	8.0	*10.7*	0.0	30.6	13.1	0.0	0.7	22.9	21.6	4.3	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*183.1*	*6.9*	*5.2*	*0.0*	*27.3*	*13.1*	*0.0*	*0.7*	*22.9*	*0.0*	*4.3*	*0.0*
COUT-C-5	207.6	8.0	*10.7*	0.0	30.6	13.1	0.0	0.7	22.9	21.6	4.3	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*182.8*	*6.9*	*5.2*	*0.0*	*27.3*	*13.1*	*0.0*	*0.7*	*22.9*	*0.0*	*4.3*	*0.0*

TABLE 3-120
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE INVENTORY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles[1]	Special Status Mammals (miles crossed)			Special Status Birds (miles crossed)							
					Potential Habitat				Greater Sage-grouse			
		Black-footed Ferret Management Areas	White-tailed Prairie Dog Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[2]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks Located Outside Core Areas or Priority Habitat
Alternatives COUT-H and COUT-I												
COUT-H (Applicant Preferred Alternative)	200.6	8.0	*10.8*	0.0	30.6	9.6	0.0	0.9	41.6	21.6	9.0	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*175.8*	*6.9*	*5.3*	*0.0*	*27.3*	*9.6*	*0.0*	*0.9*	*41.6*	*0.0*	*9.0*	*0.0*
COUT-I	302.1	8.0	*14.0*	0.0	30.6	13.3	0.0	0.6	38.2	21.6	10.6	0.0
Colorado	*24.8*	*1.1*	*5.5*	*0.0*	*3.3*	*0.0*	*0.0*	*0.0*	*0.0*	*21.6*	*0.0*	*0.0*
Utah	*215.4*	*6.9*	*8.5*	*0.0*	*27.3*	*13.3*	*0.0*	*0.6*	*38.2*	*0.0*	*10.6*	*0.0*

NOTES:
[1]Each of the special status mammals and birds will not add to the total miles column due to overlapping habitats.
[2]Designated in Wyoming Executive Order 2011-5
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources represented in this table are listed for each special status wildlife resource in Table 3-97.

TABLE 3-121
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route[1]	Columbian Sharp-tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
	Number of Known Leks within 4 Miles of Centerline	Acres of Winter Habitat	Number of Known Nests within 1 Mile of Centerline	Number of Known Winter Roost Sites Crossed	Number of Known Nests within 0.5 Mile of Centerline	Acres of Post-fledging Areas	Number of Known Post-fledging areas within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Acres of nesting Areas	Number of Known Nests within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Number of Nests within 0.25 Mile
Alternative COUT-A and Route Variation												
COUT-A	0	0	0	2	0	53	1	0	0	12	53	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*2*	*0*	*53*	*1*	*0*	*0*	*12*	*53*	*1*
COUT-A-1	0	0	0	2	0	53	1	0	0	12	53	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*2*	*0*	*53*	*1*	*0*	*0*	*12*	*53*	*1*
Alternative COUT-B and Route Variations												
COUT-B	0	0	0	2	0	80	1	0	0	12	53	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*2*	*0*	*80*	*1*	*0*	*0*	*12*	*53*	*1*
COUT-B-1	–	–	–	–	–	80	1	–	–	11	53	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	*80*	*1*	–	–	*11*	*53*	*1*
COUT-B-2	–	–	–	–	–	80	1	–	–	11	53	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	*80*	*1*	–	–	*11*	*53*	*1*
COUT-B-3	–	–	–	–	–	80	1	–	–	11	53	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	*80*	*1*	–	–	*11*	*53*	*1*
COUT-B-4	–	–	–	–	–	80	1	–	–	11	53	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	*80*	*1*	–	–	*11*	*53*	*1*
COUT-B-5	–	–	–	–	–	80	1	–	–	11	53	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	*80*	*1*	–	–	*11*	*53*	*1*

TABLE 3-121
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route[1]	Columbian Sharp-tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
	Number of Known Leks within 4 Miles of Centerline	Acres of Winter Habitat	Number of Known Nests within 1 Mile of Centerline	Number of Known Winter Roost Sites Crossed	Number of Known Nests within 0.5 Mile of Centerline	Acres of Post-fledging Areas	Number of Known Post-fledging areas within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Acres of nesting Areas	Number of Known Nests within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Number of Nests within 0.25 Mile
Alternative COUT-C and Route Variations												
COUT-C	0	0	0	0	0	0	0	3	0	18	22	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*18*	*22*	*1*
COUT-C-1	–	–	–	–	–	–	–	3	–	17	22	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	–	–	*3*	–	*17*	*22*	*1*
COUT-C-2	–	–	–	–	–	–	–	3	–	17	22	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	–	–	*3*	–	*17*	*22*	*1*
COUT-C-3 (Agency Preferred Alternative)	–	–	–	–	–	–	–	3	–	17	22	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	–	–	*3*	–	*17*	*22*	*1*
COUT-C-4	–	–	–	–	–	–	–	3	–	17	22	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	–	–	*3*	–	*17*	*22*	*1*
COUT-C-5	–	–	–	–	–	–	–	3	–	17	22	1
Colorado	–	–	–	–	–	–	–	–	–	–	–	–
Utah	–	–	–	–	–	–	–	*3*	–	*17*	*22*	*1*

TABLE 3-121
ALTERNATIVE ROUTE COMPARISON FOR ADDITIONAL SPECIAL STATUS WILDLIFE INVENTORY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route[1]	Columbian Sharp-tailed Grouse		Bald Eagle		Northern Goshawk			Peregrine Falcon		Golden Eagle	Ferruginous Hawk	Swainson's Hawk
	Number of Known Leks within 4 Miles of Centerline	Acres of Winter Habitat	Number of Known Nests within 1 Mile of Centerline	Number of Known Winter Roost Sites Crossed	Number of Known Nests within 0.5 Mile of Centerline	Acres of Post-fledging Areas	Number of Known Post-fledging areas within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Acres of nesting Areas	Number of Known Nests within 0.5 Mile of Centerline	Number of Known Nests within 1 Mile of Centerline	Number of Nests within 0.25 Mile
COUT-H and COUT-I												
COUT-H (Applicant Preferred Alternative)	0	0	0	0	0	0	0	3	0	28	22	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*28*	*22*	*1*
COUT-I	0	0	0	0	2	0	0	3	0	37	24	1
Colorado	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Utah	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*3*	*0*	*37*	*24*	*1*

NOTES:
[1]Comprehensive raptor nest survey data are not currently available for all alternative routes but preconstruction surveys will be conducted along the selected alternative route and seasonal and spatial restrictions on construction and maintenance (Selective Mitigation Measure 12) would be applied to all known nests.
This table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). Zeros reported in this table do not represent absence data and dashes (-) appear where data were not available. The specific data sources represented in this table are listed for each special status wildlife resource in Table 3-97.

TABLE 3-122
SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ALTERNATIVE ROUTE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH, TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Number of Sage-grouse Leks		
	Within 2 Miles	Within 4 Miles	Within 11 Miles
Alternative COUT-A and Route Variation			
COUT-A	5	10	22
Colorado	*0*	*0*	*6*
Utah	*5*	*10*	*16*
COUT-A-1	5	10	22
Colorado	*0*	*0*	*6*
Utah	*5*	*10*	*16*
Alternative COUT-B and Route Variations			
COUT-B	6	9	28
Colorado	*0*	*0*	*6*
Utah	*6*	*9*	*22*
COUT-B-1	0	2	18
Colorado	*0*	*0*	*6*
Utah	*0*	*2*	*12*
COUT-B-2	0	2	18
Colorado	*0*	*0*	*6*
Utah	*0*	*2*	*12*
COUT-B-3	0	2	18
Colorado	*0*	*0*	*6*
Utah	*0*	*2*	*12*
COUT-B-4	0	2	18
Colorado	*0*	*0*	*6*
Utah	*0*	*2*	*12*
COUT-B-5	0	2	18
Colorado	*0*	*0*	*6*
Utah	*0*	*2*	*12*
Alternative COUT-C and Route Variations			
COUT-C	10	12	24
Colorado	*0*	*0*	*6*
Utah	*10*	*12*	*18*
COUT-C-1	0	1	11
Colorado	*0*	*0*	*6*
Utah	*0*	*1*	*5*
COUT-C-2	0	1	11
Colorado	*0*	*0*	*6*
Utah	*0*	*1*	*5*
COUT-C-3 (Agency Preferred Alternative)	0	1	11
Colorado	*0*	*0*	*6*
Utah	*0*	*1*	*5*
COUT-C-4	0	1	11
Colorado	*0*	*0*	*6*
Utah	*0*	*1*	*5*
COUT-C-5	0	1	11
Colorado	*0*	*0*	*6*
Utah	*0*	*1*	*5*

TABLE 3-122 SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ALTERNATIVE ROUTE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH, TO CLOVER (COUT) ALTERNATIVE ROUTES			
	Number of Sage-grouse Leks		
Alternative Route	**Within 2 Miles**	**Within 4 Miles**	**Within 11 Miles**
Alternatives COUT-H and COUT-I			
COUT-H (Applicant Preferred Alternative)	5	9	21
Colorado	*0*	*0*	*6*
Utah	*5*	*9*	*15*
COUT-I	5	7	21
Colorado	*0*	*0*	*6*
Utah	*5*	*7*	*15*

NOTE:
Lek analysis includes only leks in contiguous sage-grouse habitat crossed by each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Environmental Consequences (Colorado)

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT-A in Colorado and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative COUT-A would be similar to the other COUT alternative routes (Table 3-123; MV-10a, MV-11a, and MV-12a). In Colorado, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Wolf Creek reintroduction management area). Moderate impacts would be on potential white-tailed prairie dog colonies. Low impacts would be on potential mountain plover habitat and sage-grouse general habitat.

TABLE 3-123 ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES					
		Residual Impacts[1, 2] (miles crossed)			
Alternative Route	**Total Miles**	**Nonidentifiable[3]**	**Low**	**Moderate**	**High**
Alternative COUT-A and Route Variation					
COUT-A	206.0	116.9	20.6	12.9	55.6
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*182.0*	*114.2*	*6.1*	*7.2*	*54.5*
COUT-A-1	205.6	116.5	20.6	12.9	55.6
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*181.6*	*113.8*	*6.1*	*7.2*	*54.5*

TABLE 3-123
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts[1, 2] (miles crossed)			
		Nonidentifiable[3]	Low	Moderate	High
Alternative COUT-B and Route Variations					
COUT-B	216.0	114.7	22.4	21.0	57.9
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*192.0*	*112.0*	*7.9*	*15.3*	*56.8*
COUT-B-1	212.7	132.1	22.4	18.8	39.4
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*188.7*	*129.4*	*7.9*	*13.1*	*38.3*
COUT-B-2	214.2	132.5	22.4	19.9	39.4
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*190.2*	*129.8*	*7.9*	*14.2*	*38.3*
COUT-B-3	213.9	131.0	22.4	21.1	39.4
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*189.9*	*128.3*	*7.9*	*15.4*	*38.3*
COUT-B-4	214.2	131.3	22.4	21.1	39.4
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*190.2*	*128.6*	*7.9*	*15.4*	*38.3*
COUT-B-5	213.9	132.2	22.4	19.9	39.4
Colorado	*24.0*	*2.7*	*14.5*	*5.7*	*1.1*
Utah	*189.9*	*129.5*	*7.9*	*14.2*	*38.3*
Alternative COUT-C and Route Variations					
COUT-C	209.8	111.8	37.3	15.2	45.1
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*185.0*	*109.1*	*20.7*	*10.8*	*44.4*
COUT-C-1	206.4	128.8	37.3	16.3	24.0
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*181.6*	*126.1*	*20.7*	*11.9*	*22.9*
COUT-C-2	207.9	129.2	37.3	17.4	24.0
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*183.1*	*126.5*	*20.7*	*13.0*	*22.9*
COUT-C-3 (Agency Preferred Alternative)	207.6	128.9	37.3	17.4	24.0
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*182.8*	*126.2*	*20.7*	*13.0*	*22.9*
COUT-C-4	207.9	127.9	37.3	18.7	24.0
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*183.1*	*125.2*	*20.7*	*14.3*	*22.9*
COUT-C-5	207.6	127.6	37.3	18.7	24.0
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*182.8*	*124.9*	*20.7*	*14.3*	*22.9*
Alternatives COUT-H and COUT-I					
COUT-H (Applicant Preferred Alternative)	200.6	105.4	37.3	15.2	42.7
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*175.8*	*102.7*	*20.7*	*10.8*	*41.6*

TABLE 3-123
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE RESOURCES RESIDUAL IMPACTS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Total Miles	Residual Impacts[1, 2] (miles crossed)			
		Nonidentifiable[3]	Low	Moderate	High
COUT-I	240.2	141.5	37.3	22.1	39.3
Colorado	*24.8*	*2.7*	*16.6*	*4.4*	*1.1*
Utah	*215.4*	*138.8*	*20.7*	*17.7*	*38.2*

NOTES:
[1]Where multiple special status wildlife resources are crossed, the resource with the highest impact-level assignment was reported.
[2]Includes impacts on black-footed ferret, white-tailed prairie dog, pygmy rabbit, mountain plover, Mexican spotted owl, southwestern willow flycatcher, yellow-billed cuckoo, and greater sage-grouse and associated special status habitats.
[3] Miles are along the reference centerlines where none of the modeled habitats listed in the previous note occur.

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-A in Colorado is located within 1 mile of known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-A. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative COUT-A in Colorado from Massadona to the Colorado/Utah border; however, mountain plovers are not known to currently use these habitats. Despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur if plovers are present in the habitats affected. Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative COUT-A would result in modification of the same extent of potential mountain plover habitat as Alternative COUT-B and more than Alternatives COUT-C, COUT-H, and COUT-I in Colorado (Table 3-124).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT-A in Colorado would occur in mapped general habitat and would not occur within 4 miles of known leks. Additionally, sage-grouse habitats affected by the alternative have been previously affected by noise, human presence, and vehicle use associated with the existing transmission line and highways. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse general habitat that would be affected by Alternative COUT-A is presented in Table 3-120.

Mammals

Black footed-ferret occurrences have not been recorded since a 2008 and 2009 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 4 years, and reintroductions are not

currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, Alternative COUT-A could result in effects described in Section 3.2.8.4. Alternative COUT-A crosses the same extent of Wolf Creek black footed ferret management area as Alternatives COUT-B, COUT-C, COUT-H, and COUT-I in Colorado (Table 3-120).

Potentially suitable white-tailed prairie dog colonies are present along the length of Alternative COUT-A in Colorado from Massadona to the Colorado/Utah border, disturbance to white-tailed prairie dogs and associated habitats could occur. Alternative COUT-A would affect the same extent of white-tailed prairie dog potential habitat as Alternatives COUT-B, COUT-C, COUT-H, and COUT-I in Colorado (Table 3-120).

White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-A on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Alternative COUT-A Route Variation (COUT-A-1)

The environmental consequences for Route Variation COUT-A-1 in Colorado are the same as Alternative COUT-A (Tables 3-120 and 3-123) as they follow the same alignment.

Affected Environment (Utah)

Alternative COUT-A and Route Variation COUT-A-1 in Utah follow the same geographic path with the exception of an IRA that Alternative COUT-A and Route Variation COUT-A-1 cross at the Wasatch/Utah county line just south of Baldy Mountain. Alternative COUT-A and Route Variation COUT-A-1 in Utah occur in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions and cross predominantly agriculture, big sagebrush, mountain shrub, pinyon-juniper, and shrub-steppe communities (Section 3.2.5). Smaller areas of alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, water, and wetland vegetation communities also occur along this alternative route in Utah. Special status wildlife species and habitats present and likely to be affected by Alternative COUT-A and Route Variation COUT-A-1 are described in Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-A and Route Variation COUT-A-1 in Utah are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Alternative COUT-A and Route Variation COUT-A-1 cross yellow-billed cuckoo potential habitat that occurs along intersections of the White River, Duchesne River tributaries, and Starvation Reservoir tributaries in the U.S. Highway 40 and transmission line corridor (Table 3-124 and MV-11b).

Potential mountain plover potential habitat occurs throughout the majority of the length of Alternative COUT-A and COUT-A-1 in Utah from the west side of Raven Ridge along the Utah/Colorado border to the northwest of Starvation Reservoir (Table 3-124 and MV-11b).

TABLE 3-124
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
Alternative COUT-A and Route Variation											
COUT-A	109	259	0	324	0	0	57	919	385	540	0
Colorado	*20*	*126*	*0*	*87*	*0*	*0*	*0*	*0*	*385*	*0*	*0*
Utah	*89*	*133*	*0*	*237*	*0*	*0*	*57*	*919*	*0*	*540*	*0*
COUT-A-1	109	259	0	324	0	0	57	919	385	540	0
Colorado	*20*	*126*	*0*	*87*	*0*	*0*	*0*	*0*	*385*	*0*	*0*
Utah	*89*	*133*	*0*	*237*	*0*	*0*	*57*	*919*	*0*	*540*	*0*
Alternative COUT-B and Route Variations											
COUT-B	108	276	0	375	176	0	53	951	380	430	0
Colorado	*20*	*124*	*0*	*86*	*0*	*0*	*0*	*0*	*380*	*0*	*0*
Utah	*88*	*152*	*0*	*289*	*176*	*0*	*53*	*951*	*0*	*430*	*0*
COUT-B-1	109	263	0	377	136	0	50	617	383	109	0
Colorado	*20*	*125*	*0*	*86*	*0*	*0*	*0*	*0*	*383*	*0*	*0*
Utah	*89*	*138*	*0*	*291*	*136*	*0*	*50*	*617*	*0*	*109*	*0*
COUT-B-2	108	263	0	377	156	0	50	616	383	108	0
Colorado	*20*	*125*	0	*86*	*0*	0	*0*	*0*	*383*	*0*	0
Utah	*88*	*138*	0	*291*	*156*	0	*50*	*616*	*0*	*108*	0
COUT-B-3	108	263	0	377	178	0	50	616	382	108	0
Colorado	*20*	*125*	0	*86*	*0*	0	*0*	*0*	*382*	*0*	0
Utah	*88*	*138*	0	*291*	*178*	0	*50*	*616*	*0*	*108*	0
COUT-B-4	108	263	0	377	178	0	50	615	382	108	0
Colorado	*20*	*125*	0	*87*	*0*	0	*0*	*0*	*382*	*0*	0
Utah	*88*	*138*	0	*290*	*178*	0	*50*	*615*	*0*	*108*	0
COUT-B-5	111	269	0	386	160	0	51	630	391	111	0
Colorado	*21*	*128*	0	*89*	*0*	0	*0*	*0*	*391*	*0*	0
Utah	*90*	*141*	0	*297*	*160*	0	*51*	*630*	*0*	*111*	0

TABLE 3-124
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
Alternative COUT-C and Route Variations											
COUT-C	153	220	0	586	184	0	17	851	414	450	0
Colorado	*21*	*105*	0	*63*	*0*	0	*0*	*0*	*414*	*0*	0
Utah	*132*	*115*	0	*523*	*184*	0	*17*	*851*	*0*	*450*	0
COUT-C-1	156	207	0	592	207	0	13	443	417	83	0
Colorado	*22*	*106*	0	*64*	*0*	0	*0*	*0*	*417*	*0*	0
Utah	*134*	*101*	0	*528*	*207*	0	*13*	*443*	*0*	*83*	0
COUT-C-2	154	206	0	590	227	0	13	442	416	83	0
Colorado	*21*	*106*	0	*64*	*0*	0	*0*	*0*	*416*	*0*	0
Utah	*133*	*100*	0	*526*	*227*	0	*13*	*442*	*0*	*83*	0
COUT-C-3 (Agency Preferred Alternative)	156	208	0	595	230	0	14	446	420	84	0
Colorado	*22*	*107*	0	*64*	*0*	0	*0*	*0*	*420*	*0*	0
Utah	*134*	*101*	0	*531*	*230*	0	*14*	*446*	*0*	*84*	0
COUT-C-4	156	208	0	595	255	0	14	445	420	84	0
Colorado	*22*	*107*	0	*64*	*0.0*	0	*0*	*0*	*420*	*0*	0
Utah	*134*	*101*	0	*531*	*255*	0	*14*	*445*	*0*	*84*	0
COUT-C-5	152	201	0	576	247	0	13	431	407	81	0
Colorado	*22*	*104*	0	*62*	*0*	0	*0*	*0*	*407*	*0*	0
Utah	*130*	*98*	0	*514*	*247*	0	*13*	*431*	*0*	*81*	0
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	147	199	0	564	177	0	17	766	398	166	0
Colorado	*20*	*101*	0	*61*	*0*	0	*0*	*0*	*398*	*0*	0
Utah	*127*	*98*	0	*503*	*177*	0	*17*	*766*	*0*	*166*	0

TABLE 3-124
ALTERNATIVE ROUTE COMPARISON FOR SPECIAL STATUS WILDLIFE ESTIMATED HABITAT DISTURBANCE (IN ACRES) FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Special Status Mammals			Special Status Birds							
				Potential Habitat				Greater Sage-grouse			
	Black-footed Ferret Management Areas	White-tailed Prairie Dog Potential Colony	Pygmy Rabbit Potential Habitat	Mountain Plover	Mexican Spotted Owl	Southwestern Willow Flycatcher	Yellow-billed Cuckoo	Core Areas or Priority Habitat	General Habitat and Transmission Line Corridors[1]	Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat	Habitat within 4 Miles of Leks located Outside Core Areas or Priority Habitat
COUT-I	145	254	0	555	241	0	11	693	392	192	0
Colorado	*20*	*100*	0	*60*	*0*	0	*0*	*0*	*392*	*0*	0
Utah	*125*	*154*	0	*495*	*241*	0	*11*	*693*	0	*192*	0

NOTES:
[1]Designated in Wyoming Executive Order 2011-5
This table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in this table are listed for each special status wildlife resource in Table 3-97.

Special Status Upland Game Birds

In Utah, Alternative COUT-A and Route Variation COUT-A-1 cross sage-grouse occupied, brood rearing, and winter habitat south of U.S. Highway 40 near the Colorado/Utah border, southwest of Vernal, northeast of Duchesne, and east of Strawberry Reservoir in the vicinity of Fruitland. Habitat used by four different sage-grouse populations (Strawberry/Fruitland, South Slope Uinta, Halfway Hollow, and Deadman's Bench) and areas within 4 miles of known leks in all of the populations are crossed (Map 3-5). This alternative route is parallel to an existing 345kV steel-lattice transmission line for the majority of the distance where sage-grouse habitat is crossed in Utah, including all areas within 4 miles of known leks. The extent of sage-grouse habitat crossed by Alternative COUT-A and Route Variation COUT-A-1 is presented in Table 3-120. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-122. The specific extent of sage-grouse habitat occupied by the Strawberry/Fruitland, South Slope Uinta, Halfway Hollow, and Deadman's Bench populations crossed by Alternative COUT-A and Route Variation COUT-A-1 is presented in Table 3-128. The numbers of sage grouse leks within 2, 4, and 11 miles of the alternative route in habitat occupied by the 4 populations are presented in Table 3-125.

TABLE 3-125
ALTERNATIVE ROUTE COMPARISON FOR SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Habitat Type													
	Miles Crossed													
	Core Areas or Priority Habitat[1]							Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat						
	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland
Alternative COUT-A and Route Variation														
COUT-A	0.0	9.1	0.0	12.7	–	9.0	19.1	0.0	1.7	0.0	4.2	–	7.7	15.8
COUT-A-1	0.0	9.1	0.0	12.7	–	9.0	19.1	0.0	167.4	0.0	234.5	–	165.7	352.9
Alternative COUT-B and Route Variation														
COUT-B	0.0	9.1	21.2	12.7	–	9.0	0.0	0.0	1.7	17.6	4.2	–	0.0	0.0
COUT-B-1	0.0	9.1	2.7	12.7	–	9.0	0.0	0.0	1.7	0.0	4.2	–	0.0	0.0
COUT-B-2	0.0	9.1	2.7	12.7	–	9.0	0.0	0.0	1.7	0.0	4.2	–	0.0	0.0
COUT-B-3	0.0	9.1	2.7	12.7	–	9.0	0.0	0.0	1.7	0.0	4.2	–	0.0	0.0
COUT-B-4	0.0	9.1	2.7	12.7	–	9.0	0.0	0.0	1.7	0.0	4.2	–	0.0	0.0
COUT-B-5	0.0	9.1	2.7	12.7	–	9.0	0.0	0.0	1.7	0.0	4.2	–	0.0	0.0

TABLE 3-125
ALTERNATIVE ROUTE COMPARISON FOR SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Habitat Type													
	Miles Crossed													
	Core Areas or Priority Habitat[1]							Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat						
	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland
Alternative COUT-C and Route Variation														
COUT-C	5.4	14.8	24.2	0.0	–	0.0	0.0	0.0	4.3	19.2	0.0	–	0.0	0.0
COUT-C-1	5.4	14.8	2.7	0.0	–	0.0	0.0	0.0	4.3	4.3	0.0	–	0.0	0.0
COUT-C-2	5.4	14.8	2.7	0.0	–	0.0	0.0	0.0	4.3	0.0	0.0	–	0.0	0.0
COUT-C-3 (Agency Preferred Alternative)	5.4	14.8	2.7	0.0	–	0.0	0.0	0.0	4.3	0.0	0.0	–	0.0	0.0
COUT-C-4	5.4	14.8	2.7	0.0	–	0.0	0.0	0.0	4.3	0.0	0.0	–	0.0	0.0
COUT-C-5	5.4	14.8	2.7	0.0	–	0.0	0.0	0.0	4.3	0.0	0.0	–	0.0	0.0
Alternatives COUT-H and COUT-I														
COUT-H (Applicant Preferred Alternative)	5.4	14.8	14.8	0.0	–	–	0.0	0.0	4.3	4.7	0.0	–	0.0	0.0
COUT-I	5.4	14.8	7.7	0.0	6.4	–	0.0	0.0	4.3	6.3	0.0	0.0	0.0	0.0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011e) was considered to be synonymous with priority habitat.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Sage-grouse Population Areas Crossed by Alternative COUT-A and Route Variation COUT-A-1

South Slope

The South Slope Uinta sage-grouse population is a small to medium-sized sage-grouse population limited to a moderately sized habitat area that has incurred anthropogenic and natural fragmentation (BLM 2013b). The population is estimated to range between 56 to 340 sage-grouse (14-85 males counted on 13 leks) based lek count over the last 6 years (BLM 2013b). The UDWR-designated sage-grouse habitat occupied by the South Slope population occurs in the northeastern portion of Utah in Duchesne County. The population is in the Southern Great Basin: Management Zone II identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Uintah sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is not included in any sage-grouse management area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

The 270,000-acre UDWR-designated sage-grouse habitat area occupied by the South Slope Uinta population is located on the northwestern portion of the Uinta Basin (Map 3-5). Elevation in occupied habitat ranges from 8000 feet in the north in the foothills of the Uinta Mountains to 5600 feet in the south near the Duchesne River. The southern half of the UDWR-designated sage-grouse habitat occupied by the South Slope population (primarily private lands) is fragmented and degraded habitat due to pinyon-juniper encroachment and anthropogenic activities including oil and gas development. The majority of birds in the South Slope Uinta sage-grouse population are found in the northern half of the designated habitat area, on higher elevation tribal lands where little site-specific data are available.

Oil developments occur in an east to west band across the center of the South Slope Uinta UDWR-designated habitat area. Currently 30 percent (82,560 acres) of the designated occupied habitat has development that exceeds one well per square mile (BLM 2013b). In addition, habitats across the center of the South Slope Uinta area have been affected by a series of roads, transmission lines, agriculture, and housing developments. Three leks in the southern portion of the South Slope habitat area have been vacant for over ten years but recent winter use by sage-grouse has been documented in the area (BLM 2013b). Pinyon-juniper encroachment is occurring in upper elevations of the designated sage-grouse habitat occupied by the South Slope population.

Little is known about sage-grouse movements, important seasonal habitat areas, and factors that could be limiting to the South Slope Uinta sage-grouse population due to lack of recent studies and telemetry data. Sage-grouse appear to be congregating on less disturbed, high elevation tribal lands, avoiding the lower two thirds of the UDWR-designated habitat that has been affected by various natural and anthropogenic disturbances. Sage-grouse were documented to have abandoned the Blue Bench lek after the construction of the 345kV steel-lattice Bonanza to Mona transmission line in the vicinity of the lek in the 1980s (Ellis 1985). Alternative COUT-A and its route variations are parallel to the existing 345kV steel-lattice Bonanza to Mona transmission line where it crosses habitats occupied by the South Slope Uinta sage-grouse population.

The South Slope Uinta sage-grouse population is part of the larger Utah Northeast Central population identified by Garton et al. (2011) who conducted population modeling which suggested the larger population is stable. Population-specific lek counts (UDWR 2013b) for the South Slope Uinta also suggest a stable population (BLM 2013b). In concert with all population segments making up the Uinta population, the FWS consider the management area low risk (FWS 2013).

Halfway Hollow

The Halfway Hollow sage-grouse population is a small to medium-sized sage-grouse population in a moderately sized habitat area surrounded by an increasingly developed landscape (BLM 2013b). The population is estimated to range between 120-332 sage-grouse (30-83 males counted on 10 leks), based on lek counts over the last 10 years (UDWR 2012b). The designated habitat occupied by the Halfway Hollow sage-grouse population occurs in northeastern Utah in northwest Uintah County. The population is in the Southern Great Basin: Management Zone II identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Uintah sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is partially included in the Uintah Sage-grouse Management Area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a). Habitats crossed by the Project are not in the Uintah Sage-grouse Management Area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

The 263,000-acres (106,432 hectares) of UDWR-designated sage-grouse habitat occupied by the Halfway Hollow population are located on the northeastern portion of the Uinta Basin. Elevation in occupied habitat ranges from 8,500 feet in the north in the foothills of the Uinta Mountains to 5,000 feet in the

south near the Duchesne River (Map 3-5). The Halfway Hollow area is comprised of Wyoming sagebrush at low elevations with particularly prevalent pinyon-juniper encroachment at mid-elevations, and mountain sagebrush at upper elevations. Contiguous habitat in the Halfway Hallow area ranges in condition from degraded understory vegetation with some cheatgrass at lower elevations to increasing understory diversity at mid-elevations to intact and diverse understory vegetation at upper elevations. Recently, limited telemetry monitoring has been initiated on sage-grouse in the Little Mountain area. Radio-equipped sage-grouse have remained in the upper elevation areas to date (BLM 2013b).

UDWR-designated sage-grouse habitat occupied by this population is somewhat contiguous with other medium to large sage-grouse populations (i.e., Diamond Mountain) in the region The Halfway Hollow population is likely to be more resilient to threats due to its proximity and potential connectivity with the adjacent populations. Factors impacting the Halfway Hallow sage-grouse population dynamics are not well understood, though energy development and other anthropogenic impacts could be primary factors adversely influencing this sage grouse population.

Anthropogenic habitat disturbance in habitat associated with the Halfway Hollow population has increased at a relatively slow rate, though future interest in the area is growing. The western half of the Halfway Hollow population's habitat area is dominated by agricultural fields and rural human developments. Roads, transmission lines, oil development (290 wells), and proposed oil sands development are located primarily in the southern half of the designated sage-grouse habitat area associated with the Halfway Hollow population. Oil development has been occurring at low levels with varying densities. Approximately, 14 percent of the designated sage-grouse habitat area has one well per section and 18 percent of the habitat area exceeds one well per section (BLM 2013b). On the eastern half of the area, on SITLA land, the nation's first oil sands mining operation is proposed (with potential of greater than 200 new exploratory wells (BLM 2013b).

In addition to the effects of anthropogenic development, pinyon-juniper encroachment is widespread in designated habitats in the Halfway Hollow sage-grouse population. Conservation efforts are currently focused on reclaiming sagebrush areas to improve sage-grouse habitat by removing pinyon-juniper.

The Halfway Hollow sage-grouse population is part of the larger Wyoming Basin population identified by Garton et al. (2011), who conducted population modeling which suggested the larger population is in decline. The greater Wyoming Basin population is thought to be in decline based on population modeling and lek counts, which are consistent with a downward population trend (Garton et al. 2011). The Halfway Hollow population is considered part of the Uintah sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report, which is considered to be at "low risk" (FWS 2013).

Deadman's Bench

The Deadman's Bench sage-grouse population contains two leks occupied by fewer than 10 birds each since 1989 (UDWR 2012b). The estimated population size ranges between 0-28 sage-grouse (0-7 males) based on 10 years of lek counts. The low lek occupancy suggests individual birds travel between the Deadman's Bench area and other designated sage-grouse habitats; as such a small population is not likely to persist for more than 20 years without some immigration/emigration between other populations. The UDWR-designated sage-grouse habitat associated with the Deadman's Bench population occurs in the northeastern portion of Utah in eastern Uintah County (Map 3-5). The population is in the Wyoming Basin: Management Zone II identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Uintah sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is not included in any sage-grouse management area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

The habitat occupied by the Deadman's Bench sage-grouse population encompasses 134,650 acres of dry, low elevation habitat (5400-5700 feet). Wyoming big sagebrush and understory vegetation cover including diverse forbs are present in habitats occupied by the population. Non-native weeds, including cheatgrass, are abundant and pose management concerns. The Wyoming big sagebrush canopy provides adequate sage-grouse winter habitat, though the degraded understory does not provide good nesting and brood-rearing habitat.

Limited telemetry monitoring indicates some sage-grouse equipped with radio transmitters at leks in the Deadman's Bench population stayed in the area year-round. Other radio-equipped grouse moved north of Deadman's Bench into Snake John Reef and Thunder Ranch (10-13 miles north of U.S. Highway 40). During recent sagebrush removal projects, wintering sage-grouse have been observed but the origin of these individuals is unknown (BLM 2013b).

Grazing is the primary historical anthropogenic use of habitats associated with the Deadman's Bench sage-grouse population. More recently, natural gas development has occurred throughout 60 percent of the designated sage-grouse habitat area (80,000 acres). Development currently exceeds one well per section on 45 percent of the UDWR-designated sage-grouse habitat (BLM 2013b). Other disturbances include a 345kV steel-lattice transmission line through Coyote Basin, other lower voltage transmission lines, and pipeline corridors.

The UDWR-designated sage-grouse habitat associated with the Deadman's Bench population is arid with anthropogenic disturbances and degraded habitat. These factors likely decrease the resiliency of the habitat and the associated sage-grouse population. Other factors driving sage-grouse population dynamics in this population are not well understood.

The Deadman's Bench sage-grouse population is part of the larger Wyoming Basin population identified by Garton et al. (2011), who conducted population modeling which suggested the larger population is in decline. It is difficult to evaluate a population trend in the Deadman's Bench population using lek count information available from UDWR as sage-grouse habitat extends into Colorado and lek counts fluctuate to a degree suggestive of grouse movements outside the known sage-grouse habitat area (BLM 2013b).

Strawberry/Fruitland

The Strawberry/Fruitland sage-grouse population is a small population in an area with a long history of anthropogenic effects. The Strawberry/Fruitland population is estimated to range between 135 to 630 sage-grouse (34 to158 males counted on 6 leks), based on lek counts over the last 10 years (UDWR 2012b). Habitat associated with the Strawberry/Fruitland sage-grouse population occurs in Wasatch and Duchesne counties of central Utah. The population is in the Southern Great Basin: Management Zone III identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Strawberry Valley sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is included in the Strawberry Sage-grouse Management Area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

The habitat associated with the Strawberry/Fruitland sage-grouse population encompasses 180,000 acres in Strawberry Valley and the Fruitland area. Elevation in occupied habitat ranges between 6,500 and 10,000 feet. Strawberry Valley is a high elevation valley and the Fruitland area is located on the northwestern edge of Uinta Basin (Map 3-5). Sage-grouse habitats associated with the Strawberry/Fruitland population have been adversely affected by past anthropogenic activities including grazing, agriculture, reservoir development, recreation, and development of highways and transmission lines.

U.S. Highway 40 was a known source of sage-grouse mortality as early as 1937 (Griner 1939). Strawberry Reservoir was completed in 1922 and expanded in 1974, inundating more than 17,000 acres of sage-grouse habitat (Strawberry Valley Adaptive Resource Management Local Working Group [SVARM] 2006). Recreational activities associated with the reservoir including: fishing, boating, hiking, camping, biking, OHV use, and snow-mobile use have increased in the area. Large expanses of sagebrush were removed with herbicides and smooth brome was planted to facilitate historic livestock. Livestock grazing activities have decreased over the years and have been largely absent from sage-grouse habitat in the Strawberry area since the early 1990's.

The vegetation in upper elevation habitat occupied by the Strawberry/Fruitland sage-grouse population is composed primarily of mountain big sagebrush and grasses with patches of silver sagebrush in areas that retain more moisture. Localized areas are dominated by smooth brome and lack the sagebrush cover typically selected by sage-grouse; however, forb diversity and abundance is such that sage-grouse do occur in the area (Bunnell 2000). Lower elevation habitats in the vicinity of Fruitland are largely dominated by Wyoming big sagebrush with intact understories. Invasive plants including cheatgrass and knapweeds are present (BLM 2013b). Some sage-grouse in the Strawberry/Fruitland population are one-stage migratory moving from breeding and nesting habitats in the Fruitland area to summering habitats in the Strawberry area and then back to the Fruitland area during winter months. Other individual sage-grouse are non-migratory and stay in the Fruitland area year-round (BLM 2013b).

The Strawberry/Fruitland sage-grouse population was estimated to range between 3,000 to 4,000 sage-grouse in the 1930's (Griner 1939). The population declined throughout the 20th century, with an estimated population of 600 sage-grouse in 1970 and 150 to 200 grouse in 1999. These declines represent a 95 decrease in the Strawberry/Fruitland sage-grouse population over 60 years (Bunnell 2000). Loss of sage-grouse habitat in Strawberry Valley resulting from reservoir expansion, conversion of rangeland to agriculture use, sagebrush removal, road and residential construction and observed abnormally high predation of grouse by red fox and ravens have been identified as the primary issues driving the decline of the Strawberry Valley sage-grouse population. Presence of red fox and elevated raven presence are presumed to be the result of historical changes to human land use in the habitats associated with the Strawberry/Fruitland sage-grouse population.

In an effort to augment the Strawberry/Fruitland sage-grouse population, 336 females from other populations in the state have been translocated to the Strawberry/Fruitland population since 2003. Increased lek counts and expanded habitat use have been observed since the beginning of reintroduction efforts (Baxter et al. 2013). Targeted predator control has also been conducted between 2000 and 2010 in an effort to increase sage-grouse annual survival and reproductive success (BLM 2013b).

The Strawberry/Fruitland sage-grouse population is part of the Northeast Interior Utah population identified by Garton et al. (2011). Population modeling suggests a 47 percent decline from 1970/1974 to 2000/2007 with an increasing trend from 1995 to 2007 (Garton et al. 2011). The Strawberry/Fruitland population is considered part of the Strawberry Valley sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report, which is considered to be at "at risk" with a stable population and a high potential for growth (FWS 2013).

Mammals

Alternative COUT-A and Route Variation COUT-A-1 cross the Snake John Reef black-footed ferret reintroduction management area south of Dinosaur National Monument near the Colorado/Utah border. This alternative route parallels an existing transmission line and follows the U.S. Highway 40 corridor in Utah before heading south toward Glen Bench area.

Known white-tailed prairie dog colonies are crossed by Alternative COUT-A and Route Variation COUT-A-1 in the Uinta Basin. Colonies with high population densities occur in the Snake John Reef area, south of Ashley Valley, and east of Roosevelt. Implementation of either Alternative COUT-A or Route Variation COUT-A-1 would likely require construction in areas identified in the BLM Vernal RMP as closed to ground-disturbing activities and construction of permanent aboveground facilities within 660 feet of prairie dog colonies. Exception, modification, and waiver criteria for these restrictions are included in the BLM Vernal RMP. The area where the BLM Vernal Field Office RMP restricts activities in white-tailed prairie dog colonies is in the Snake John Reef white-tailed prairie dog sub-complex, which is part of the larger Coyote Basin Complex.

Environmental Consequences (Utah)

Alternative COUT-A

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT-A in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT-A are presented in Table 3-123 and displayed on maps MV-10a, MV-11a, and MV-12a. In Utah, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Snake John Reef reintroduction management area) and sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Moderate impacts would be on potential white-tailed prairie dog colonies. Low impacts would be on potential mountain plover habitat. Alternative COUT-A would have the more high residual impacts compared to most other COUT alternative routes and similar moderate residual impacts compared to other COUT routes in Utah (Table 3-123).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-A in Utah is located within 1 mile of known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-A. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River, Duchesne River tributaries, and Starvation Reservoir tributaries that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT-A, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the White River, Duchesne River tributaries, and Starvation Reservoir tributaries in Duchesne and Uintah counties. Alternative COUT-A would result in the same loss of potential yellow-billed cuckoo habitat as Alternative COUT-B, more than Alternatives COUT-C, COUT-H, and COUT-I in Utah (Table 3-124).

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative COUT-A in Utah, from the west side of Raven Ridge to northwest of Starvation Reservoir. Despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-124). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative COUT-A would result in modification of less potential mountain plover habitat than Alternative COUT-B and significantly less than Alternatives COUT-C, COUT-H, and COUT-I in Utah (Table 3-124).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT-A in Utah would occur in areas where the alternative is parallel to an existing high-voltage transmission line (345kV steel-lattice structure) that has degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse occupied habitat, affected statewide by Alternative COUT-A is presented in Table 3-124 and the extent of habitat affected in each Utah population crossed in presented in Table 3-126.

TABLE 3-126
ALTERNATIVE ROUTE COMPARISON
SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Habitat Type													
	Acres Affected													
	Core Areas or Priority Habitat[1]							Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat						
	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland
Alternative COUT-A and Route Variation														
COUT-A	0	167	0	234	–	166	353	0	31	0	77	–	142	293
COUT-A-1	0	167	0	234	–	166	353	0	31	0	77	–	142	293
Alternative COUT-B and Route Variation														
COUT-B	0	165	388	232	–	165	0	0	31	321	76	–	0	0
COUT-B-1	0	167	50	233	–	166	0	0	31	0	76	–	0	0
COUT-B-2	0	166	50	233	–	166	0	0	31	0	76	–	0	0
COUT-B-3	0	166	50	233	–	166	0	0	31	0	76	–	0	0
COUT-B-4	0	166	50	233	–	166	0	0	31	0	76	–	0	0
COUT-B-5	0	170	51	238	–	170	0	0	32	0	78	–	0	0

TABLE 3-126
ALTERNATIVE ROUTE COMPARISON
SAGE-GROUSE HABITAT INVENTORY BY UTAH POPULATIONS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Habitat Type													
	Acres Affected													
	Core Areas or Priority Habitat[1]							Habitat within 4 Miles of Leks Located in Core Areas or Priority Habitat						
	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland	Anthro Mountain	Deadman's Bench	Emma Park	Halfway Hollow	Horn Mountain	South Slope Uinta	Strawberry/Fruitland
Alternative COUT-C and Route Variation														
COUT-C	104	283	464	0	–	0	0	0	83.0	368	0	–	0	0
COUT-C-1	104	286	53	0	–	0	0	0	84	84	0	–	0	0
COUT-C-2	103	285	53	0	–	0	0	0	83	0	0	–	0	0
COUT-C-3 (Agency Preferred Alternative)	104	287	53	0	–	0	0	0	84	0	0	–	0	0
COUT-C-4	104	287	53	0	–	0	0	0	84	0	0	–	0	0
COUT-C-5	101	278	51	0	–	0	0	0	82	0	0	–	0	0
Alternatives COUT-H and COUT-I														
COUT-H (Applicant Preferred Alternative)	99	272	272	0	–	0	0	0	0	0	0	–	0	0
COUT-I	97	268	139	0	115	0	0	0	79	114	0	0	0	0

NOTES:
[1]For the purpose of this analysis, greater sage-grouse occupied habitat in Utah (Utah Division of Wildlife Resources 2011e) was considered to be synonymous with priority habitat.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). Zeros reported in the table do not represent absence data. The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Alternative COUT-A cross sage-grouse habitat used by the Strawberry/Fruitland, South Slope Uinta, Halfway Hollow, and Deadman's Bench populations within 4 miles of active leks. Areas within 4 miles of leks are presumably the most important area for maintaining individual and statewide sage-grouse populations in Utah. Habitats affected by this alternative route used by the Strawberry/Fruitland sage-grouse population are in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-grouse populations and habitats (State of Utah 2013a). This alternative route would occur within 4 miles of leks attended by all the male sage-grouse in the Strawberry/Fruitland population; therefore this alternative route could result in effects on this population that may increase the need for intensive management to ensure its long-term persistence. On a statewide basis, leks within 4 miles of Alternative COUT-A have low sage-grouse attendance compared to other leks in the state thus; the affected leks presumably having lower importance for maintaining statewide sage-grouse populations than leks with greater attendance. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-A over the past 5 years and percentage of the average statewide sage-grouse male lek counts that this represents are presented in

Table 3-127. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-A in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-128.

TABLE 3-127
SUMMARY OF 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF REFERENCE ROUTE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	5-Year Average Sage-grouse Lek Counts[1]		
	Statewide Sum	Sum within 4 miles	Percentage of Leks within 4 miles
Alternative COUT-A and Route Variation			
COUT-A			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*26*	*1*
COUT-A-1			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*26*	*1*
Alternative COUT-B and Route Variations			
COUT-B			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*80*	*3*
COUT-B-1			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*1*	*0*
COUT-B-2			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*1*	*0*
COUT-B-3 (Agency Preferred Alternative)			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*1*	*0*
COUT-B-4			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*1*	*0*
COUT-B-5			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*1*	*0*
Alternative COUT-C and Route Variations			
COUT-C			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*91*	*2*
COUT-C-1			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
COUT-C-2			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
COUT-C-3			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
COUT-C-4			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*

TABLE 3-127
SUMMARY OF 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN 4 MILES OF REFERENCE ROUTE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	5-Year Average Sage-grouse Lek Counts[1]		
	Statewide Sum	Sum within 4 miles	Percentage of Leks within 4 miles
COUT-C-5			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*0*	*0*
Alternatives COUT-H and COUT-I			
COUT-H (Applicant Preferred Alternative)			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*58*	*2*
COUT-I			
Colorado	*3,077*	*0*	*0*
Utah	*3,655*	*42*	*1*

NOTES:
[1]Not all leks have been counted each year during the past 5 years and lek counts may have been conducted using different methodologies in different states. For leks without data for the past 5 consecutive years, an average of the number of counts available during the period was used. The counts are state specific and do not sum for each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area). Zeros reported in the table do not represent absence data. The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Mammals

Black-footed ferret reintroductions are ongoing in the Snake John Reef reintroduction management area. Ferrets, suitable habitats (prairie dog towns), and available prey (prairie dogs) could be adversely affected by this alternative route. Alternative COUT-A crosses the same extent of black-footed ferret management area as Alternative COUT-B and less than Alternatives COUT-C, COUT-H, and COUT-I (Table 3-124).

Habitats adjacent to the existing transmission line in the Snake John Reef black-footed ferret reintroduction management area have likely already incurred the adverse effects of transmission line presence. These effects could include increased predation on black-footed ferrets and small mammal prey base, including but not limited to white-tailed prairie dogs, from raptors that use the transmission line structures as hunting perches. Where Alternative COUT-A is parallel to the existing transmission line, the effects of the alternative on ferrets and ferret habitat and prey could be reduced, relative to areas where existing tower structures are absent.

Alternative COUT-A would affect the same extent of potential white-tailed prairie dog colonies as Alternative COUT-B and more than Alternatives COUT-C, COUT-H, and COUT-I in Utah. White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-A on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
South Slope Uinta Population											
Alternative COUT-A and Route Variation											
COUT-A	4	0	2	0	0	2	0	0	3	0	0
COUT-A-1	4	0	2	0	0	2	0	0	3	0	0
Alternative COUT-B and Route Variations											
COUT-B	4	0	0	0	0	0	0	0	2	0	0
COUT-B-1	4	0	0	0	0	0	0	0	2	0	0
COUT B-2	4	0	0	0	0	0	0	0	0	0	0
COUT-B-3	4	0	0	0	0	0	0	0	0	0	0
COUT-B-4	4	0	0	0	0	0	0	0	0	0	0
COUT-B-5	4	0	0	0	0	0	0	0	0	0	0
Alternative COUT-C and Route Variations											
COUT-C	4	0	0	0	0	0	0	0	0	0	0
COUT-C-1	4	0	0	0	0	0	0	0	0	0	0
COUT-C-2	4	0	0	0	0	0	0	0	0	0	0
COUT-C-3 (Agency Preferred Alternative)	4	0	0	0	0	0	0	0	0	0	0
COUT-C-4	4	0	0	0	0	0	0	0	0	0	0
COUT-C-5	4	0	0	0	0	0	0	0	0	0	0

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	4	0	0	0	0	0	0	0	0	0	0
COUT-I	4	0	0	0	0	0	0	0	0	0	0
Halfway Hollow Population											
Alternative COUT-A and Route Variation											
COUT-A	8	39	0	0	0	1	0	0	3	1	0
COUT-A-1	8	39	0	0	0	1	0	0	3	1	0
Alternative COUT-B and Route Variations											
COUT-B	8	39	0	0	0	1	0	0	3	1	0
COUT-B-1	8	39	0	0	0	1	0	0	3	1	0
COUT B-2	8	39	0	0	0	1	0	0	3	1	0
COUT-B-3	8	39	0	0	0	1	0	0	3	1	0
COUT-B-4	8	39	0	0	0	1	0	0	3	1	0
COUT-B-5	8	39	0	0	0	1	0	0	3	1	0

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternative COUT-C and Route Variations											
COUT-C	8	39	0	0	0	0	0	0	0	0	0
COUT-C-1	8	39	0	0	0	0	0	0	0	0	0
COUT-C-2	8	39	0	0	0	0	0	0	0	0	0
COUT-C-3 (Agency Preferred Alternative)	8	39	0	0	0	0	0	0	0	0	0
COUT-C-4	8	39	0	0	0	0	0	0	0	0	0
COUT-C-5	8	39	0	0	0	0	0	0	0	0	0
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	8	39	0	0	0	0	0	0	0	0	0
COUT-I	8	39	0	0	0	0	0	0	0	0	0
Deadman's Bench Population											
COUT-A and Route Variation											
COUT-A	2	2	0	0	0	2	2	100	2	2	100
COUT-A-1	2	2	0	0	0	2	2	100	2	2	100

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternative COUT-B and Route Variations											
COUT-B	2	2	0	0	0	2	2	100	2	2	100
COUT-B-1	2	2	0	0	0	2	2	100	2	2	100
COUT B-2	2	2	0	0	0	2	2	100	2	2	100
COUT-B-3	2	2	0	0	0	2	2	100	2	2	100
COUT-B-4	2	2	0	0	0	2	2	100	2	2	100
COUT-B-5	2	2	0	0	0	2	2	100	2	2	100
Alternative COUT-C and Route Variations											
COUT-C	2	2	0	0	0	1	0	0	2	2	100
COUT-C-1	2	2	0	0	0	1	0	0	2	2	100
COUT-C-2	2	2	0	0	0	1	0	0	2	2	100
COUT-C-3 (Agency Preferred Alternative)	2	2	0	0	0	1	0	0	2	2	100
COUT-C-4	2	2	0	0	0	1	0	0	2	2	100
COUT-C-5	2	2	0	0	0	1	0	0	2	2	100
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	2	2	0	0	0	1	0	0	2	2	100
COUT-I	2	2	0	0	0	1	0	0	2	2	100

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Strawberry/Fruitland Population											
Alternative COUT-A and Route Variation											
COUT-A	9	82	3	29	36	6	30	36	8	82	100
COUT-A-1	9	82	3	29	36	6	30	36	8	82	100
Alternative COUT-B and Route Variations											
COUT-B	9	82	0	0	0	0	0	0	0	0	0
COUT-B-1	9	82	0	0	0	0	0	0	0	0	0
COUT B-2	9	82	0	0	0	0	0	0	0	0	0
COUT-B-3	9	82	0	0	0	0	0	0	0	0	0
COUT-B-4	9	82	0	0	0	0	0	0	0	0	0
COUT-B-5	9	82	0	0	0	0	0	0	0	0	0
Alternative COUT-C and Route Variations											
COUT-C	9	82	0	0	0	0	0	0	0	0	0
COUT-C-1	9	82	0	0	0	0	0	0	0	0	0
COUT-C-2	9	82	0	0	0	0	0	0	0	0	0
COUT-C-3 (Agency Preferred Alternative)	9	82	0	0	0	0	0	0	0	0	0
COUT-C-4	9	82	0	0	0	0	0	0	0	0	0
COUT-C-5	9	82	0	0	0	0	0	0	0	0	0

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	9	82	0	0	0	0	0	0	0	0	0
COUT-I	9	82	0	0	0	0	0	0	0	0	0
Emma Park Population											
Alternative COUT-A and Route Variation											
COUT-A	13	137	0	0	0	0	0	0	0	0	0
COUT-A-1	13	137	0	0	**0**	0	0	0	0	0	0
Alternative COUT-B and Route Variations											
COUT-B	13	137	6	59	43	7	101	74	13	137	100
COUT-B-1	13	137	0	0	0	0	0	0	3	28	20
COUT B-2	13	137	0	0	0	0	0	0	3	28	20
COUT-B-3	13	137	0	0	0	0	0	0	3	28	20
COUT-B-4	13	137	0	0	0	0	0	0	3	28	20
COUT-B-5	13	137	0	0	0	0	0		3	28	20

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternative COUT-C and Route Variations											
COUT-C	13	137	10	111	81	11	119	87	13	137	100
COUT-C-1	13	137	0	0	0	0	0	0	3	28	20
COUT-C-2	13	137	0	0	0	0	0	0	3	28	20
COUT-C-3 (Agency Preferred Alternative)	13	137	0	0	0	0	0	0	3	28	20
COUT-C-4	13	137	0	0	0	0	0	0	3	28	20
COUT-C-5	13	137	0	0	0	0	0	0	3	28	20
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	13	137	5	52	38	8	80	59	10	109	80
COUT-I	13	137	5	59	43	6	59	43	10	109	80
Anthro Mountain Population											
Alternative COUT-A and Route Variation											
COUT-A	5	10	0	0	0	0	0	0	0	0	0
COUT-A-1	5	10	0	0	0	0	0	0	0	0	0

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternative COUT-B and Route Variations											
COUT-B	5	10	0	0	0	0	0	0	0	0	0
COUT-B-1	5	10	0	0	0	0	0	0	0	0	0
COUT B-2	5	10	0	0	0	0	0	0	0	0	0
COUT-B-3	5	10	0	0	0	0	0	0	0	0	0
COUT-B-4	5	10	0	0	0	0	0	0	0	0	0
COUT-B-5	5	10	0	0	0	0	0	0	0	0	0
Alternative COUT-C and Route Variations											
COUT-C	5	10	0	0	0	1	0	0	0	0	0
COUT-C-1	5	10	0	0	0	1	0	0	0	0	0
COUT-C-2	5	10	0	0	0	1	0	0	0	0	0
COUT-C-3 (Agency Preferred Alternative)	5	10	0	0	0	1	0	0	0	0	0
COUT-C-4	5	10	0	0	0	1	0	0	0	0	0
COUT-C-5	5	10	0	0	0	1	0	0	0	0	0

TABLE 3-128
SUMMARY OF THE NUMBER OF LEKS AND 5-YEAR AVERAGE SAGE-GROUSE LEK COUNTS AT LEKS WITHIN UTAH POPULATIONS CROSSED WITHIN 2, 4, AND 11 MILES OF REFERENCE CENTERLINES FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Sage-grouse Population Total Leks		Sage-grouse Leks within 2 Miles of the Alternative Route			Sage-grouse Leks within 4 Miles of the Alternative Route			Sage-grouse Leks within 11 Miles of the Alternative Route		
	Number of Leks	Sum of 5-Year Average Lek Counts Number of Leks	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count	Number of Leks	Sum of 5-Year Average Lek Counts	Percent of Population-wide 5-Year Average Lek Count
Alternatives COUT-H and COUT-I											
COUT-H (Applicant Preferred Alternative)	5	10	0	0	0	1	0	0	0	0	0
COUT-I	5	10	0	0	0	1	0	0	0	0	0
Horn Mountain Population											
COUT-I	2	9	0	0	0	1	0	0	0	0	0

NOTE:
Lek analysis incudes only leks in contiguous sage-grouse habitat crossed by each alternative route.
The table is based on the best available special status wildlife resource data for each state (i.e., data not collected with the intention of reporting an exhaustive survey of the entire Project area. Zeros reported in the table do not represent absence data). The specific data sources of the inventories reported in the table are listed for each special status wildlife resource in Table 3-97.

Implementation of Alternative COUT-A likely would result in impacts on individuals in prairie dog colonies in the Snake John Reef white-tailed prairie dog sub-complex due to the high density of prairie dog occupancy in this area. Approval of Alternative COUT-A or Route Variation COUT-A-1 would require BLM to grant an exception, modification, or waiver to management stipulations identified in the BLM Vernal Field Office RMP prohibiting surface disturbance or construction of permanent aboveground structures within 660 feet of prairie dog colonies in the Snake John Reef white-tailed prairie dog sub-complex. Implementation of Design Features 3, 26, 27, 28, and 30 would reduce the level of potential effects on white-tailed prairie dogs in this area.

If exceptions to CSU stipulations identified in the BLM Vernal Field Office RMP were granted, BLM would require additional mitigation measures to reduce potential effects on white-tailed prairie dogs in the Snake John Reef sub-complex. Mitigation could include micro siting the transmission line to avoid areas of high prairie dog densities or co-locating the transmission line with existing transmission lines in prairie dogs colonies to the extent practicable (Selective Mitigation Measures 2 and 7), altering transmission line structure type and installing perch deterrents to reduce raptor predation on prairie dogs (Selective Mitigation Measures 6 and 14), or other measures implemented in accordance with agency requirements. A qualitative discussion of the potential residual effects on white-tailed prairie dogs that could occur even with application of mitigation measures are described in Section 3.2.8.4.

Alternative COUT-A Route Variation (COUT-A-1)

The environmental consequences for Route Variation COUT-A-1 in Utah are the same as Alternative COUT-A (Table 3-120) as they follow the same alignment with the exception of an IRA that Alternative COUT-A and Route Variation COUT-A-1 cross at the Wasatch/Utah county line just south of Baldy Mountain.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-A and Route Variation COUT-A-1 would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

Affected Environment for Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, COUT-B-5 in Colorado would be the same as Alternative COUT-A (Table 3-120) as the two routes follow the same alignment.

Environmental Consequences (Colorado)

Alternative COUT-B

The environmental consequences of Alternative COUT-B in Colorado would be the same as Alternative COUT-A (Tables 3-120 and 3-123) as the two routes follow the same alignment.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

The environmental consequences for Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Colorado are the same as Alternative COUT-B as they follow the same alignment.

Affected Environment (Utah)

Alternative COUT-B in Utah occurs in the Colorado Plateau, Wasatch and Uinta mountains, and Central Basin and Range ecoregions, which predominantly contain big sagebrush, mountain shrub, pinyon-juniper, and shrub-steppe communities (Section 3.2.5). Smaller areas of agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also occur along this alternative route in Utah. Special status wildlife species and habitats present and likely to be affected by Alternative COUT-B are described in Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Slight differences occur in the number of miles of Mexican spotted owl, black-footed ferret, white-tailed prairie dog and yellow-billed cuckoo potential habitat between Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah (Table 3-120). In Utah, Alternative COUT-B crosses the greatest amount of white-tailed prairie dog and yellow-billed cuckoo priority habitat, as well as sage-grouse priority habitat and habitats within 4 miles of leks located in priority habitat among the COUT-B route variations. In the Emma Park area Alternative COUT-B crosses the greatest amount of white-tailed prairie dog potential habitat, as well as substantial amounts of sage-grouse priority habitat and habitats within 4 miles of leks located in priority habitats.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-B in Utah are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Alternative COUT-B is crossed by yellow-billed cuckoo potential habitat along intersections of the White River, Duchesne River tributaries, and Starvation Reservoir tributaries in the U.S. Highway 40 and transmission line corridor (MV-11b).

Potential Mountain plover habitat occurs throughout the majority of the length of Alternative COUT-B in Utah from the Utah/Colorado border to the Starvation Reservoir area (MV-11b).

Potential Mexican spotted owl habitat is crossed by Alternative COUT-B where the alternative route parallels Highway 191 and an existing transmission line corridor in Duchesne County at Argyle Ridge near the Ashley National Forest (MV-11b).

Special Status Upland Game Birds

In Utah, Alternative COUT-B crosses sage-grouse occupied, brood rearing, and winter habitats supporting the Deadman's Bench, South Slope Uinta, Halfway Hollow, Anthro Mountain, and Emma Park sage-grouse populations (Map 3-5). Five different mapped habitat areas are crossed, and areas within 4 miles of known leks is crossed in three of the habitat areas. This alternative route is parallel to an existing 345kV steel lattice transmission line for approximately half of the distance where sage-grouse habitat is crossed in Utah and crosses within 4 miles of known leks in areas where it would not be parallel to an existing transmission line. The extent of sage-grouse habitat crossed by Alternative COUT-B is presented in Table 3-120 and the extent of each population crossed is present in Table 3-126. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-122, the number of leks and the average number of male sage-grouse that have been counted on those leks over the past 5 years in the populations crossed and the percentage of the average population-wide sage-grouse male lek counts that this represents are presented in Table 3-128.

Sage-grouse Population Areas Crossed by Alternative COUT-B

South Slope, Halfway Hollow, and Deadman's Bench

Refer to the descriptions of the sage-grouse habitats associated with the South Slope, Halfway Hollow, and Deadman's Bench populations under Alternative COUT-A (Map 3-5).

Anthro Mountain

Areas occupied by the Anthro Mountain sage-grouse population include a collection of small and disconnected patches of sage-grouse habitat. The population is estimated at approximately 150 sage-grouse (range 16-176 individuals, 4-44 males counted on 5 leks) based on lek counts over the last 10 years (UDWR 2012b). Designated sage-grouse habitat associated with the Anthro Mountain population occurs in the southwestern portion of the Uinta Basin in southern Duchesne County. The population is in the Southern Great Basin: Management Zone III identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Carbon sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is not included in any sage-grouse management area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

Habitats used by the Anthro Mountain sage-grouse population have been affected by past and ongoing livestock grazing and energy development. Livestock grazing intensity in the area has declined compared to historic use. However, a number of vegetation treatments, including sage-brush removal, have been conducted in the past to facilitate forage production for livestock. Energy development is common in habitats used by the Anthro Mountain sage-grouse population and well densities exceeding one well per section occur on 28 percent of the habitat (BLM 2013b). Energy development is continuing in the area; habitats in the eastern portion of the Anthro Mountain area (Sand Wash, Big Wash, Wrinkles, and Cowboy Bench areas) are anticipated to incur 1,300 new wells in the future. Additionally, new development (400 wells) will occur on the northern portion of the UDWR-designated sage-grouse habitat occupied by the Anthro Mountain population. Both developments will increase the fragmentation and disturbance associated with human activity and access. Exploratory drilling will be conducted on the southern portion of the Anthro Mountain.

The habitats used by the Anthro Mountain sage-grouse are located on a northeast sloping plateau bounded by Argyle Ridge to the south and the Duchesne River to the north (Map 3-5). There are a total of 107,300 acres of UDWR-designated sage-grouse habitat in the Anthro Mountain area, which is naturally fragmented by a series of drainages (BLM 2013b). Upper elevation habitats (9,000 feet) used by the population are characterized by abundant and diverse shrublands including mountain big sagebrush with

intact understory vegetation. Shrub habitats are interspersed with pockets of aspen and Douglas-fir stands and pinyon-juniper vegetation types occur in deep drainages. The upper elevation habitat is small and disconnected from other sage-grouse habitat areas. Pinyon-juniper dominates the landscape at mid-elevations. Mid-elevation habitats do not represent suitable sage-grouse habitat in this area. Lower elevation areas (5,600 feet) are dominated by sagebrush and represent habitats used by the Anthro Mountain sage-grouse population. Shrubs in these lower elevation areas are predominantly Wyoming big sagebrush with some black sagebrush. Pinyon-juniper encroachment is occurring in some areas, and invasive plants including cheatgrass occur. Understory vegetation is less diverse and robust compared to higher elevation habitats.

Despite natural and anthropogenic fragmentation of habitat, telemetry data suggest sage-grouse are moving large distances to unconnected seasonal habitats including movements off the plateau. These seasonal movements include documented sage-grouse movements ranging between 14 and 33 miles to the Emma Park, West Tavaputs, Fruitland, and Blue Bench areas (BLM 2013b). While many sage-grouse movement patterns have been documented, seasonal migrations and seasonal habitat use are not well understood.

In response to observed population declines, sixty hens were translocated to the Anthro Mountain population between 2009 and 2010. Bird survival was documented to be low in 2009 and 2010 with an increase in 2010 and 2011. Overall population dynamics are still not well understood (BLM 2013b).

The Anthro Mountain sage-grouse population is part of the larger Northeast Interior Utah population identified by Garton et al. (2011), who conducted population modeling which suggests a 47 percent decline in the larger population from 1970-1974 to 2000-2007 with an increasing trend from 1995 to 2007. Population-specific lek counts for this area suggest a declining population (BLM 2013b).

Emma Park

The Emma Park population is a medium-sized sage-grouse population located on a relatively small habitat area naturally bounded by topography including mountains and steep canyons. The population is estimated to range between 400-1000 sage-grouse (68-223 males counted on 11 leks) based on lek counts over the past 10 years (UDWR 2012b). The Emma Park UDWR-designated sage-grouse habitat occurs in Utah, Duchesne, Wasatch, and Carbon counties of central Utah (Map 3-5). Habitats supporting this sage-grouse population are in the Southern Great Basin: Management Zone III identified in the Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006) and Carbon sage-grouse management area identified in the Greater Sage-grouse Conservation Objectives Final Report (FWS 2013). The population is included in the Carbon Sage-grouse Management Area identified in the Conservation Plan for Greater Sage-grouse in Utah (State of Utah 2013a).

The UDWR-designated habitat occupied by the Emma Park population encompasses 300,000 acres of sage-grouse habitat. All known active leks occur on a 166,000 acre sloping plateau bisected by a number of drainages. Sage-grouse that occupy this area have been observed to display non-migratory behaviors. Elevations on the plateau range from 7,000 to 8,500 feet, with higher elevations in the south. Habitats on the plateau are affected by precipitation, topographic constraints, and isolated anthropogenic disturbances. The majority of habitat on the plateau is dominated by mountain big sagebrush. Black sagebrush occurs in isolated areas on shallow, rocky slopes and basin big sagebrush occurs along the major drainages (Crompton and Mitchell 2005). Upper elevations have mixed stands of aspen and Douglas-fir interspersed with mountain shrub communities. Limiting factors for sage-grouse that occupy the plateau are not well understood but precipitation and limited habitat quantity and quality could be driving the sage-grouse population dynamics.

Coal resources occur underneath sage-grouse habitats occupied by the Emma Park sage-grouse population and the population has been directly and indirectly affected by various anthropogenic disturbances. Historic coal mines are present across much of the plateau. Past mining activities may have affected the permeability of soils, decreasing their ability to retain moisture and potentially adversely affecting habitat suitability for sage-grouse. Coalbed methane development is currently occurring in localized areas, including areas in proximity to active leks. Noise emitted by an operational coalbed methane pumpjack was documented to displace strutting male sage-grouse (Crompton and Mitchell 2005). Coalbed methane development has contributed to other anthropogenic activities including highway and transmission line development that have fragmented and degraded the quality of habitat used by the Emma Park population. Sage-grouse mortality and eagle observations were positively correlated to proximity to these existing disturbances. Additionally, habitats occupied by the Emma Park population have historically and continue to be utilized for sheep grazing. Grazing by cattle has not occurred since the 1980's (Crompton and Mitchell 2005).

Four other discrete designated sage-grouse habitat areas were historically considered part of the Emma Park sage-grouse population. These areas are south and southwest of the larger plateau occupied by the Emma Park population. Three small, historically occupied sage-grouse habitat areas totaling 79,500 acres occur west of Scofield Reservoir. Sage-grouse presence has not been recently documented in these areas. Additionally, 53,000 acres of habitat have been designated as sage-grouse habitat by UDWR on the Gordon Creek plateau west of Price. The eastern half of the Gordon Creek area has been affected by the development of 325 natural gas wells and sage-grouse presence has not been recently confirmed in the area (BLM 2013b). These four historic sage-grouse habitat areas do not support the existing Emma Park sage-grouse population and were considered separately for the purpose of the analysis of potential effects on this population.

The Emma Park sage-grouse population is part of the Northeast Interior Utah population identified by Garton et al. (2011). Population modeling suggests a 47 percent decline from 1970-1974 to 2000-2007 with an increasing trend from 1995 to 2007 (Garton et al. 2011). The Emma Park population is considered to be "at-risk", but stable, despite fluctuations in lek attendance over the past 10 years (FWS 2013).

Mammals

Alternative COUT-B in Utah crosses the same black-footed ferret habitat as Alternative COUT-A (Table 3-120), as the two routes follow the same alignment through the Snake John Reef Reintroduction Management Area.

Alternative COUT-B would affect similar extents of white-tailed prairie dog potential habitat as Alternative COUT-A in Utah (Table 3-120), as the two routes follow similar alignments through white-tailed prairie dog potential colonies. Similar to Alternative COUT-A, Alternative COUT-B would likely require construction in areas in the BLM Vernal Field Office closed to ground-disturbing activities and construction of permanent aboveground facilities within 660 feet of prairie dog colonies. Exception, modification, and waiver criteria for these restrictions are included in the BLM Vernal RMP. The area where the BLM Vernal Field Office RMP restricts activities in white-tailed prairie dog colonies is in the Snake John Reef white-tailed prairie dog sub-complex, which is part of the larger Coyote Basin Complex.

<u>Environmental Consequences (Utah)</u>

Alternative COUT-B

<u>Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes</u>

The types of potential effects on special status wildlife that could occur for Alternative COUT-B in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4.

After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT-B are presented in Table 3-123 and displayed on maps MV-10a, MV-11a, and MV-12a. The resources contributing to the high, moderate, and low impacts are the same for Alternative COUT-B as Alternative COUT-A; however, Alternative COUT-B also crosses potential Mexican spotted owl habitat, which contributes to the moderate impacts of this route in Utah. Alternative COUT-B would have more high residual impacts compared to most other COUT alternative routes and similar moderate residual impacts compared to other COUT routes in Utah (Table 3-123).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-B in Utah is located within 1 mile of known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-B. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River, Duchesne River tributaries, and Starvation Reservoir tributaries that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT-B, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along intersections of the White River, Duchesne River tributaries, and Starvation Reservoir tributaries in Duchesne and Uintah counties. Alternative COUT-B would result in the same loss of potential yellow-billed cuckoo habitat as Alternative COUT-A and more than Alternatives COUT-C, COUT-H, and COUT-I in Utah (Table 3-124).

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative COUT-B in Utah from the Utah/Colorado border to the Starvation Reservoir area, and despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-124). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative COUT-B would result in modification of more potential mountain plover habitat than Alternative COUT-A and significantly less than Alternatives COUT-C, COUT-H, and COUT-I in Utah (Table 3-124).

Mexican spotted owl potential habitat is crossed by this alternative route in the Argyle Ridge area is considered fair habitat, though no formal surveys have been completed (McDonald and Emmett). If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operation of the transmission line. Alternative COUT-B would result in modification of more potential Mexican spotted owl habitat than Alternative COUT-A and less than Alternatives COUT-C, COUT-H, and COUT-I in Utah (Table 3-124).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT-B in Utah would occur in areas where the alternative is parallel to an existing high-voltage transmission line (345kV steel-lattice structure) that has degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). However, Alternative COUT-B also would affect sage-grouse habitats that have not experienced the adverse effects of anthropogenic development. The estimated area of sage-grouse occupied habitat, affected statewide by Alternative COUT-B is presented in Table 3-124 and the extent of habitat affected in each Utah population crossed in presented in Table 3-126.

Alternative COUT-B crosses sage-grouse habitat used by the Halfway Hollow, Deadman's Bench, and Emma Park populations within 4 miles of active leks. Areas within 4 miles of leks are presumably the most important areas for maintaining individual and statewide sage-grouse populations in Utah. Habitats affected by this alternative route and used by the Emma Park sage-grouse populations area in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-grouse populations and habitats (State of Utah 2013a). This alternative route would occur within 4 miles of leks attended by the majority of male sage-grouse in the Emma Park sage-grouse population. On a statewide basis, leks within 4 miles of Alternative COUT-B have greater attendance by sage-grouse compared to leks within 4 miles of Alternative COUT-A, and presumably have higher importance for maintaining statewide sage-grouse populations than leks within 4 miles of Alternative COUT-A. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-B during the past 5 years and percentage of the average Utah statewide sage-grouse male lek counts that this represents are presented in Table 3-116. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-B in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-128.

Mammals

The types of potential effects of Alternative COUT-B in Utah on black-footed ferret in Utah would be the same as Alternative COUT-A (Table 3-120) as the two routes follow the same alignment through the Snake John Reef reintroduction management area. Alternative COUT-B crosses the same extent of black-footed ferret management area as COUT-A and less than Alternatives COUT-C, COUT-H, and COUT-I (Table 3-124).

The effects of Alternative COUT-B on white-tailed prairie dog potential colonies in Utah would be similar to Alternative COUT-A (Table 3-120) as the two routes follow similar geographic paths through white-tailed prairie dog potential colonies. Alternative COUT-B crosses the same extent of potential white-tailed prairie dog potential colonies as Alternative COUT-A and more than Alternatives COUT-C, COUT-H, and COUT-I in Utah.

Implementation of Alternative COUT-B likely would result in impacts on individuals in prairie dog colonies in the Snake John Reef white-tailed prairie dog sub-complex due to the high density of prairie dog occupancy in this area. Approval of Alternative COUT-B would require BLM to grant an exception, modification, or waiver to management stipulations identified in the BLM Vernal Field Office RMP prohibiting surface disturbance or construction of permanent aboveground structures within 660 feet of prairie dog colonies in the Snake John Reef white-tailed prairie dog sub-complex. Implementation of Design Features 3, 26, 27, 28, and 30 would reduce the level of potential effects on white-tailed prairie dogs in this area.

If exceptions to CSU stipulations identified in the BLM Vernal Field Office RMP were granted, BLM would require additional mitigation measures to reduce potential effects on white-tailed prairie dogs in the Snake John Reef sub-complex. Mitigation could include micro siting the transmission line to avoid areas of high prairie dog densities or co-locating the transmission line with existing transmission lines in prairie dogs colonies to the extent practicable (Selective Mitigation Measures 2 and 7), altering transmission line structure type and installing perch deterrents to reduce raptor predation on prairie dogs (Selective Mitigation Measures 6 and 14), or other measures implemented in accordance with agency requirements. A qualitative discussion of the potential residual effects on white-tailed prairie dogs that could occur even with application of mitigation measures are described in Section 3.2.8.4.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Slight differences occur in the extent of disturbance (in acres) to black-footed ferret, mountain plover, and Mexican spotted owl potential habitats between Alternative COUT-B and Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-5 in Utah (Table 3-124).

In the Emma Park area, Route Variations COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 do not cross any habitats with 4 miles of known sage-grouse leks and would affect significantly less sage-grouse priority habitat than Alternative COUT-B (Table 3-125).

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-B and associated route variations would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-B and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-B and associated route variations would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C in Colorado is entirely in the Colorado Plateau Ecoregion, which predominantly contains big sagebrush communities (Section 3.2.5). Smaller areas of barren/sparsely vegetated, developed/disturbed, invasive, pinyon-juniper, and shrub steppe vegetation communities are crossed by this alternative route in Colorado. Special status wildlife species and habitats present and likely to be affected by this alternative route are described in Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-C in Colorado are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Alternative COUT-C in Colorado crosses mountain plover potential habitat just east of the Utah/Colorado border in Rio Blanco County and to the northwest of oil and gas development in the Coal Oil Basin and parallel to an existing transmission line corridor (MV-11b). Mountain plovers are not currently known to occupy potential habitat in these areas.

Special Status Upland Game Birds

In Colorado, Alternative COUT-C crosses sage-grouse general habitats, but would not cross priority habitats or habitats within 4 miles of leks (Table 3-120, MV-12b). The alternative is parallel to existing high-voltage transmission lines and a paved highway (MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT-C and is presented in Table 3-120. The numbers of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-123.

Mammals

Alternative COUT-C crosses through sagebrush, grassland, and pinyon-juniper habitats in the Wolf Creek black-footed ferret reintroduction management area. The COUT alternative routes would follow an existing transmission line and U.S. Highway 40 in the black-footed ferret reintroduction management area (Table 3-120). Reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012).

White-tailed prairie dog colonies are crossed by Alternative COUT-C along U.S. Highway 40 in Colorado. Alternative COUT-C is parallel to an existing 345kV transmission line with steel lattice towers in this area (MV-11b).

<u>Environmental Consequences (Colorado)</u>

Alternative COUT-C

<u>Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes</u>

The types of potential effects on special status wildlife that could occur for Alternative COUT-C in Colorado and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Colorado under Alternative COUT-C would be similar to other COUT alternative routes (Table 3-123; MV-10a, MV-11a, and MV-12a). The resources contributing to the different amounts of high, moderate, and low impacts are the same for Alternative COUT-C as Alternatives COUT-A and COUT-B.

<u>Results of Additional Analysis of Potential Impacts</u>

<u>Birds</u>

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-C in Colorado is located within 1 mile of

known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-C. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative COUT-A in Colorado from Massadona to the Colorado/Utah border; however, mountain plovers are not known to currently use these habitats. Despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur if plovers are present in the habitats affected (Table 3-124). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative COUT-C would result in modification of the same extent of potential mountain plover habitat as Alternatives COUT-H, and COUT-I and less than Alternatives COUT-A and COUT-B in Colorado (Table 3-124).

Special Status Upland Game Birds

Much of the impacts on sage-grouse associated with Alternative COUT-C in Colorado would occur in mapped general habitat and would not occur within 4 miles of known leks. Additionally, sage-grouse habitats affected by the alternative have been previously affected by noise, human presence, and vehicle use associated with the existing transmission line. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse general habitat that would be affected by Alternative COUT-C is presented in Table 3-115.

Mammals

Black-footed ferret occurrences have not been recorded since a 2008 and 2009 plague affected the Wolf Creek ferret population, ferrets have not been located in the last 4 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, Alternative COUT-C could result in effects described in Section 3.2.8.4. Alternative COUT-C crosses the same extent of black-footed ferret management area as Alternatives COUT-A, COUT-B, COUT-H, and COUT-I (Table 3-120).

Potentially suitable white-tailed prairie dog potential colonies are present along the length of the alternative route from Massadona to the Colorado/Utah border and disturbance to white-tailed prairie dogs and associated habitats is likely to occur. Alternative COUT-C crosses the same extent of white-tailed prairie dog potential habitat as Alternatives COUT-B, COUT-A, COUT-H, and COUT-I in Colorado (Table 3-120). White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-C on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

The environmental consequences for Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Colorado are the same as Alternative COUT-C (Table 3-120) as they follow the same alignment.

Affected Environment (Utah)

Alternative COUT-C in Utah occurs in the Colorado Plateau, Wasatch and Uinta mountains, and Central Basin and Range Ecoregions, which predominantly contain big sagebrush, mountain shrub, pinyon-juniper, and shrub-steppe communities (Section 3.2.5). Smaller areas of agriculture, alpine, aspen, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also occur along this alternative route in Utah. Special status wildlife species and habitats present and likely to be affected by Alternative COUT-C are described in the Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120. Slight differences in the number of miles of Mexican spotted owl, black-footed ferret, white-tailed prairie dog and yellow-billed cuckoo potential habitat occur between Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah (Table 3-120). In Utah, Alternative COUT-C crosses the greatest amount of white-tailed prairie dog, and yellow-billed cuckoo habitat, habitats within 4 miles of sage-grouse leks located in priority habitats, sage-grouse priority habitat among the Alternative COUT-C route variations.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-C in Utah are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Alternative COUT-C crosses yellow-billed cuckoo potential habitat that occurs along intersections of the White River and its tributaries south of Glen Bench and Eightmile Flat in Uintah County through riparian areas primarily undisturbed by existing human development (MV-11b).

Mountain plover potential habitat occurs throughout the majority of the length of Alternative COUT-C and its route variations in Utah from the Utah/Colorado border to the Starvation Reservoir area (MV-11b).

Mexican spotted owl potential habitat is crossed by Alternative COUT-C at intersections with the Duchesne/Carbon County border in the Argyle Ridge area south of the Bad Land Cliffs (MV-11b).

Special Status Upland Game Birds

In Utah, Alternative COUT-C crosses sage-grouse occupied, brood rearing, and winter habitat southeast of the Bonanza Power Plant, north of Nine Mile Canyon, north of Argyle Canyon, and in the Emma Park area, which support the Deadman's Bench, Anthro Mountain, and Emma Park populations (Map 3-5). Additionally, sage-grouse occupied and winter habitat is crossed north of Nine Mile Canyon, and occupied habitat is crossed east of Emma Park (MV-12b). A total of six different mapped habitat areas is crossed, and areas within 4 miles of known leks is crossed in 4 of the habitat areas (MV-12b). This alternative route is parallel to an existing 345kV steel lattice transmission line for approximately 1.5 miles where sage-grouse habitat is crossed in Utah and crosses within 4 miles of known leks in areas where it parallels an existing transmission line. The extent of sage-grouse habitat crossed by Alternative COUT-C is presented in Table 3-120; the extent of each population crossed is presented in Table 3-126. The number of sage-grouse leks within 2, 4, and 11 miles of the alternative route statewide are presented in Table 3-122. The number of leks and the average number of male sage-grouse that have been counted on those leks over the past 5 years in the populations crossed and the percentage of the average population-wide sage-grouse male lek counts that this represents are presented in Table 3-128.

Sage-grouse Population Areas Crossed by Alternative COUT-C

Emma Park and Anthro Mountain

Refer to the Alternative COUT-B section for descriptions of sage-grouse habitats associated with the Emma Park and Anthro Mountain sage-grouse populations.

Deadman's Bench

Refer to the Alternative COUT-A section for a description of sage-grouse habitat associated with the Deadman's Bench population.

Mammals

Alternative COUT-C in Utah crosses the Coyote Basin black-footed ferret reintroduction management area between the Colorado/Utah border and Bonanza. Alternative COUT-C is parallel to existing 345kV transmission line with steel lattice structures in this area (MV-10b).

Known white-tailed prairie dog colonies are crossed by Alternative COUT-C in Coyote Basin between the Colorado/Utah border and Bonanza. Alternative COUT-C is parallel to existing 345kV transmission line with steel lattice structures in this area (MV-10b). Alternative COUT-C would likely require construction in areas in the BLM Vernal Field Office closed to ground-disturbing activities and construction of permanent aboveground facilities within 660 feet of prairie dog colonies. Exception, modification, and waiver criteria for these restrictions are included in the BLM Vernal RMP. The area where the BLM Vernal Field Office RMP restricts activities in white-tailed prairie dog colonies is in the Coyote Basin white-tailed prairie dog sub-complex, which is part of the larger Coyote Basin Complex.

Environmental Consequences (Utah)

Alternative COUT-C

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT-C in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT-C are presented in Table 3-123 and displayed on maps MV-10a, MV-11a, and MV-12a. In Utah, high residual impacts on special status wildlife resources would be due to impacts on black-footed ferret habitat in reintroduction management areas (i.e., the Snake John Reef) and sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Moderate impacts would be on potential whit-tailed prairie dog colonies and potential Mexican spotted owl habitat. Low impacts would be on potential mountain plover habitat. Alternative COUT-C would have the least high residual impacts compared to Alternatives COUT-A and COUT-B, but fewer high impacts than Alternatives COUT-H and COUT-I in Utah (Table 3-123). Alternative COUT-C would have similar moderate residual impacts compared to other COUT routes in Utah (Table 3-123).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-C in Utah is located within 1 mile of known

raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-C. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River and its tributaries in Uintah County that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT-C, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the White River and its tributaries in Uintah County. Alternative COUT-C would result in more loss of potential yellow-billed cuckoo habitat than Alternatives COUT-H and COUT-I and less than Alternatives COUT-A and COUT-B in Utah (Table 3-124).

Potential mountain plover habitat is relatively abundant in areas crossed by Alternative COUT-A from the Utah/Colorado border to the West Tavaputs Plateau and despite the implementation of temporal and spatial avoidance mitigation measures, some disturbance to mountain plovers and their habitats could occur (Table 3-124). Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and would be likely to continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete. Alternative COUT-C would result in modification of the same extent of potential mountain plover habitat as Alternative COUT-H and COUT-I and more than Alternatives COUT-A and COUT-B in Utah (Table 3-124).

Mexican spotted owls are not known to occupy the potential habitat crossed in the Argyle Ridge area south of the Bad Land Cliffs, though no formal surveys have been completed (Beagley 2012). If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operation of the transmission line. Alternative COUT-B would result in modification of less potential Mexican spotted owl habitat than COUT-I, and more than Alternatives COUT-A and COUT-B in Utah (Table 3-124).

Special Status Upland Game Birds

Some of the impacts on sage-grouse associated with Alternative COUT-C in Utah would occur in areas where the alternative is parallel to an existing high-voltage transmission line (345kV steel-lattice structure) that has degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). However, Alternative COUT-C also would affect sage-grouse habitats that have not experienced the adverse effects of anthropogenic development. The estimated area of sage-grouse occupied habitat, affected statewide by Alternative COUT-C is presented in Table 3-120 and the extent of habitat affected in each Utah population crossed in presented in Table 3-126.

Alternative COUT-C crosses sage-grouse habitat within 4 miles of active leks located in priority habitats used by the Deadman's Bench and Emma park populations. Areas within 4 miles of leks are presumably the most important areas for maintaining individual and statewide sage-grouse populations in Utah. Habitats affected by this alternative route used by the Emma Park sage-grouse populations are in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-grouse populations and habitats (State of Utah 2013a). This alternative route would occur within 4 miles

of leks attended by the majority of male sage-grouse in the Emma Park population. On a statewide basis, leks within 4 miles of Alternative COUT-C have greater attendance by sage-grouse compared to leks within 4 miles of Alternatives COUT-A and COUT-B, and presumably have higher importance for maintaining statewide sage-grouse populations than leks within 4 miles of these alternative routes.

The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-C during the past 5 years and percentage of the average Utah statewide sage-grouse male lek counts that this represents are presented in Table 3-116. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-C in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-128.

Mammals

Black-footed ferret reintroductions are ongoing in the Coyote Basin reintroduction management area. Ferrets, suitable habitats (prairie dog towns), and available prey (prairie dogs) could be adversely affected by this alternative route. Alternative COUT-C crosses the same extent of black-footed ferret management area as Alternatives COUT-H and COUT-I and more than Alternatives COUT-A and COUT-B in Utah (Table 3-124).

Habitats adjacent to the existing 345kV steel lattice transmission line in the Coyote Basin ferret reintroduction management area have likely already incurred the adverse effects of transmission line presence including decreased prey base and increased predation from raptors resulting from introduction of perches onto the landscape. Where Alternative COUT-C is parallel to the existing transmission line, the effects of the alternative on ferrets and ferret habitat and prey could be reduced relative to areas where tower structures are absent, as these resources have already been affected by the existing transmission line.

Alternative COUT-C would affect the same amount of white-tailed prairie dog potential colonies as Alternatives COUT-H and COUT-I and more than Alternatives COUT-A and COUT-B in Utah. White-tailed prairie dog potential colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-C on white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

Implementation of Alternative COUT-C likely would result in impacts on individuals in prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex due to the high density of prairie dog occupancy in this area. Approval of Alternative COUT-C would require BLM to grant an exception, modification, or waiver to management stipulations identified in the BLM Vernal Field Office RMP prohibiting surface disturbance or construction of permanent aboveground structures within 660 feet of prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex. Implementation of Design Features 3, 26, 27, 28, and 30 would reduce the level of potential effects on white-tailed prairie dogs in this area.

If exceptions to CSU stipulations identified in the BLM Vernal Field Office RMP were granted, BLM would require additional mitigation measures to reduce potential effects on white-tailed prairie dogs in the Coyote Basin sub-complex. Mitigation could include micro siting the transmission line to avoid areas of high prairie dog densities or co-locating the transmission line with existing transmission lines in prairie dogs colonies to the extent practicable (Selective Mitigation Measures 2 and 7), altering transmission line structure type and installing perch deterrents to reduce raptor predation on prairie dogs (Selective Mitigation Measures 6 and 14), or other measures implemented in accordance with agency requirements.

A qualitative discussion of the potential residual effects on white-tailed prairie dogs that could occur even with application of mitigation measures are described in Section 3.2.8.4.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Slight differences occur in the extent of disturbance (in acres) to black-footed ferret, mountain plover, and Mexican spotted owl potential habitats between Alternative COUT-C and Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 in Utah (Table 3-124).

In the Emma Park area, Route Variations COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5 do not cross any habitats with 4 miles of known sage-grouse leks and would affect significantly less sage-grouse priority habitat than Alternative COUT-C (Table 3-125).

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-C and associated route variations would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-C and associated route variations would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-C and associated route variations would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences for Alternative COUT-H in Colorado would be the same as Alternative COUT-C (Tables 3-120 and 3-123), as the two routes follow the same geographical alignment.

Affected Environment (Utah)

Alternative COUT-H in Utah occurs in the Colorado Plateaus, Wasatch and Uinta mountains, and Central Basin and Range ecoregions which predominantly contain aspen, big sagebrush, mountain shrub, pinyon-juniper, and shrub-steppe communities (Section 3.2.5). Smaller areas of agriculture, alpine, barren/sparsely vegetated, developed/disturbed, grassland, invasive, montane forest, riparian, water, and wetland vegetation communities also occur along this alternative route in Utah. Special status wildlife species and habitats present and likely to be affected by Alternative COUT-H are described in Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-H in Utah are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Potential yellow-billed cuckoo potential occurs along intersections of the White River and its tributaries south of Glen Bench and the Eightmile Flat area in Uintah County through riparian areas undisturbed by existing human development (MV-11b).

Mountain plover potential habitat occurs throughout the majority of the length of Alternative COUT-H in Utah from the Utah/Colorado border to the Starvation Reservoir area (MV-11b).

Mexican spotted owl potential habitat is crossed by Alternative COUT-H would be the same as Alternative COUT-C, as the two alternative routes follow the same alignment through Mexican spotted owl potential habitat in Utah (Table 3-120).

Special Status Upland Game Birds

In Utah, Alternative COUT-H crosses sage-grouse occupied, brood rearing, and winter habitats south of the Bonanza Power Plant, north of Nine Mile Canyon, north of Argyle Canyon, and in the Emma Park area, which support the South Slope Uinta, Deadman's Bench, and Emma park sage-grouse populations (Map 3-5). Additionally, sage-grouse occupied and winter habitat is crossed north of Nine Mile Canyon; occupied habitat is crossed east of Emma Park, west of Price, and in the Sanpete Valley; and occupied and brood rearing habitat is crossed near Utah State Route 264 and Slick Hills Hollow on the Manti-La Sal National Forest (MV-12b). A total of nine different mapped habitat areas is crossed, and areas within 4 miles of known leks is crossed in four of the habitat areas. This alternative route is parallel to an existing transmission line 345kV steel lattice for two areas where sage-grouse habitat is crossed in Utah, and crosses within 4 miles of known leks in areas where it would not be parallel to an existing transmission line (MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT-H is presented in Table 3-120. The extent of each population crossed is presented in Table 3-125. The number of sage-grouse leks within 2, 4, and 11 miles of the alternative route statewide are presented in Table 3-122. The number of leks and the average number of male sage-grouse that have been counted on those leks over the past 5 years in the populations crossed and the percentage of the average population-wide sage-grouse male lek counts that this represents are presented in Table 3-128.

<u>Sage-grouse Population Areas Crossed by Alternative COUT-H</u>

<u>Emma Park and Anthro Mountain</u>

Refer to the Alternative COUT-B section for descriptions of sage-grouse habitats associated with the Emma Park and Anthro Mountain populations.

<u>Deadman's Bench</u>

Refer to the Alternative COUT-A section for a description of sage-grouse habitat associated with the Deadman's Bench population.

Mammals

Alternative COUT-H in Utah crosses the same extent of the Coyote Basin black-footed ferret reintroduction area as Alternative COUT-C in Utah (Table 3-120), as the two routes follow the same alignment through the reintroduction management area.

Alternative COUT-H in Utah crosses white-tailed prairie dog potential colonies to the same extent as Alternative COUT-C (Table 3-120), as the two routes follow the same alignment through white-tailed prairie dog potential colonies. Similar to Alternative COUT-C, Alternative COUT-H crosses known white-tailed prairie dog colonies in Coyote Basin between the Colorado/Utah border and Bonanza. Alternative COUT-H is parallel to existing 345kV transmission line with steel lattice structures in this area (MV-10b). Alternative COUT-H would likely require construction in areas in the BLM Vernal Field Office closed to ground-disturbing activities and construction of permanent aboveground facilities within 660 feet of prairie dog colonies. Exception, modification, and waiver criteria for these restrictions are included in the BLM Vernal RMP. The area where the BLM Vernal Field Office RMP restricts activities in white-tailed prairie dog colonies is in the Coyote Basin white-tailed prairie dog sub-complex, which is part of the larger Coyote Basin Complex.

Environmental Consequences (Utah)

Alternative COUT-H

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT-H in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT-H are presented in Table 3-123 and displayed on maps MV-10a, MV-11a, and MV-12a. The resources contributing to high, moderate, and low impacts are the same for Alternative COUT-H as Alternative COUT-C. Alternative COUT-C would have the least high residual impacts compared to most other COUT alternative routes and similar moderate residual impacts compared to other COUT routes in Utah (Table 3-123).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-H in Utah is located within 1 mile of known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-H. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River and its tributaries in Uintah County that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT-H, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the White River and its tributaries in Uintah County. Alternative COUT-H would result in less loss of potential yellow-billed

cuckoo habitat than Alternatives COUT-A, COUT-B, and COUT-C, and more than Alternative COUT-I in Utah (Table 3-124).

Alternative COUT-H in Utah would result in the same effects on potential mountain plover habitat as Alternatives COUT-C and COUT-I as the three routes follow the same alignment through mountain plover potential habitat (Table 3-124).

Alternative COUT-H would result in the same effects on Mexican spotted owl potential habitat in Utah as Alternative COUT-C as the two alternative routes follow the same alignment Mexican spotted owl potential habitat (Table 3-124).

Special Status Upland Game Birds

Some of the impacts on sage-grouse associated with Alternative COUT-H in Utah would occur in areas where the alternative is parallel to an existing high-voltage transmission line (345kV steel-lattice structure) that has degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). The estimated area of sage-grouse occupied habitat, affected statewide by Alternative COUT-A is presented in Table 3-120 and the extent of habitat affected in each Utah population crossed in presented in Table 3-126.

Alternative COUT-H crosses sage-grouse habitat used by the Deadman's Bench and Emma Park populations, within 4 miles of active leks. Areas within 4 miles of leks are presumably the most important areas for maintaining individual and statewide sage-grouse populations in Utah. Habitats affected by this alternative route and used by the Emma Park sage-grouse populations are in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-grouse populations and habitats (State of Utah 2013a). This alternative route would occur within 4 miles of leks attended by over half of the male sage-grouse in the Emma Park population. On a statewide basis, leks within 4 miles of Alternative COUT-H have greater attendance by sage-grouse compared to leks within 4 miles of Alternative COUT-A; thus, leks affected by Alternative COUT-H would presumably have higher importance for maintaining statewide sage-grouse populations than leks within 4 miles of Alternative COUT-A.

The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-H during the past 5 years and percentage of the average Utah statewide sage-grouse male lek counts that this represents are presented in Table 3-127. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-H in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-128.

Mammals

Alternative COUT-H in Utah would have the same effects on the Coyote Basin black-footed ferret reintroduction management area as Alternative COUT-C in Utah (Table 3-120), as the two routes follow the same alignment through the reintroduction management area Alternative COUT-H would affect the same amount of potential white-tailed prairie dog potential colonies as Alternatives COUT-C, and COUT-I and more than Alternatives COUT-A and COUT-B in Utah (Table 3-120). White-tailed prairie dog potential colonies crossed are adjacent to existing human development and linear infrastructure and are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-H on white-tailed prairie dog potential colonies could be reduced, relative to areas where transmission line structures are absent, in areas where the alternative would be adjacent to the existing 345kV steel-lattice transmission line.

Implementation of Alternative COUT-H likely would result in impacts on individuals in prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex due to the high density of prairie dog occupancy in this area. Approval of Alternative COUT-H would require BLM to grant an exception, modification, or waiver to management stipulations identified in the BLM Vernal Field Office RMP prohibiting surface disturbance or construction of permanent aboveground structures within 660 feet of prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex. Implementation of Design Features 3, 26, 27, 28, and 30 would reduce the level of potential effects on white-tailed prairie dogs in this area.

If exceptions to CSU stipulations identified in the BLM Vernal Field Office RMP were granted, BLM would require additional mitigation measures to reduce potential effects on white-tailed prairie dogs in the Coyote Basin sub-complex. Mitigation could include micro siting the transmission line to avoid areas of high prairie dog densities or co-locating the transmission line with existing transmission lines in prairie dogs colonies to the extent practicable (Selective Mitigation Measures 2 and 7), altering transmission line structure type and installing perch deterrents to reduce raptor predation on prairie dogs (Selective Mitigation Measures 6 and 14), or other measures implemented in accordance with agency requirements. A qualitative discussion of the potential residual effects on white-tailed prairie dogs that could occur even with application of mitigation measures are described in Section 3.2.8.4.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-H would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-H would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-H would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-I

Affected Environment and Environmental Consequences (Colorado)

The affected environment and environmental consequences for Alternative COUT-I in Colorado would be the same as Alternative COUT-C (Tables 3-120 and 3-123) as the two routes follow the same geographical alignment.

Affected Environment (Utah)

Alternative COUT-I in Utah occurs in the Colorado Plateau, Wasatch and Uinta mountains, and Central Basin and Range ecoregions which predominantly contain aspen, barren/sparsely vegetated, big sagebrush, pinyon-juniper, and shrub-steppe communities (Section 3.2.5). Smaller areas of agriculture, alpine, developed/disturbed, grassland, invasive, montane forest, mountain shrub, riparian, water, and wetland vegetation communities also occur along this alternative route in Utah. Special status wildlife species and habitats present and likely to be affected by this alternative route are described in Environmental Setting for the COUT alternative routes. The extent of potential habitat for special status wildlife species crossed by each COUT alternative route is presented in Table 3-120.

Birds

Special Status Raptors and Migratory Birds

The numbers of eagle, peregrine falcon, golden eagle, ferruginous hawk, and Swainson's hawk nests that would be located within 1 mile of Alternative COUT-I in Utah are presented in Table 3-121. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

Alternative COUT-I crosses yellow-billed cuckoo potential habitat along intersections of the White River and its tributaries south of Glen Bench and Eightmile Flat in Uintah County through riparian areas undisturbed by existing human development (MV-11b and Table 3-120).

Mountain plover potential habitat occurs throughout the majority of the length of Alternative COUT-I in Utah from the Utah/Colorado border to the Uinta Basin area (MV-11b).

Mexican Spotted owl potential habitat is crossed by Alternative COUT-I at the Duchesne/Carbon County border in the Argyle Ridge area and the Coal Creek area south of the Roan Cliffs (MV-11b).

Special Status Upland Game Birds

In Utah, Alternative COUT-I crosses greater sage-grouse occupied, brood rearing, and winter habitats southeast of the Bonanza Power Plant, north of Nine Mile Canyon, north of Argyle Canyon, in the Emma Park area, and on the Manti-La Sal National Forest north of Joes Valley Reservoir, which support the Deadman's Bench, Anthro Mountain, Emma Park, and Horn Mountain sage-grouse populations (MV-12b). Additionally, sage-grouse occupied and winter habitat is crossed north of Nine Mile Canyon; occupied habitat is crossed east of Emma Park, west of Price, and in the Sanpete Valley; and occupied and brood rearing habitat is crossed northeast of Joes Valley Reservoir on the Manti-La Sal National Forest. Ten different mapped habitat areas are crossed, and areas within 4 miles of known leks are crossed in four of the habitat areas. The alternative is parallel to an existing 345kV wood H-frame transmission line for 5 areas where sage-grouse habitat is crossed in Utah, and crosses within 4 miles of known leks in areas where it would not be parallel to an existing transmission line (MV-12b). The extent of sage-grouse habitat crossed by Alternative COUT-I is presented in Table 3-120. The extent of each population crossed is presented in Table 3-126. The number of sage-grouse leks within 2, 4, and 11 miles of the alternative route are presented in Table 3-122. The number of leks and the average number of male sage-grouse that have been counted on those leks over the past 5 years in the populations crossed and the percentage of the average population-wide sage-grouse male lek counts that this represents are presented in Table 3-128.

<u>Sage-grouse Population Areas Crossed by Alternative COUT-I</u>

<u>Horn Mountain</u>

Refer to the Alternative COUT BAX-B section for a description of sage-grouse habitat associated with the Horn Mountain population.

<u>Emma Park and Anthro Mountain</u>

Refer to the Alternative COUT-B section for descriptions of sage-grouse habitats associated with the Emma Park and Anthro Mountain populations.

<u>Deadman's Bench</u>

Refer to the Alternative COUT-A section for a description of sage-grouse habitats associated with the Deadman's Bench population.

Mammals

Alternative COUT-I in Utah would cross the same extent of the Coyote Basin black-footed ferret reintroduction management area as Alternative COUT-C in Utah (Table 3-120), as the two routes follow the same alignment through the reintroduction management area.

Alternative COUT-I in Utah crosses white-tailed prairie dog potential colonies to the same extent as Alternative COUT-C (Table 3-120), as the two routes follow the same alignment through white-tailed prairie dog potential colonies.

Similar to Alternative COUT-C, Alternative COUT-I crosses known white-tailed prairie dog colonies in Coyote Basin between the Colorado/Utah border and Bonanza. Alternative COUT-I is parallel to existing 345kV transmission line with steel lattice structures in this area (MV-11b). Alternative COUT-I would likely require construction in areas in the BLM Vernal Field Office closed to ground-disturbing activities and construction of permanent aboveground facilities within 660 feet of prairie dog colonies. Exception, modification, and waiver criteria for these restrictions are included in the BLM Vernal RMP. The area where the BLM Vernal Field Office RMP restricts activities in white-tailed prairie dog colonies is in the Coyote Basin white-tailed prairie dog sub-complex, which is part of the larger Coyote Basin Complex.

Environmental Consequences (Utah)

Results of Analysis Conducted to Support Interdisciplinary Comparison of Alternative Routes

The types of potential effects on special status wildlife that could occur for Alternative COUT-I in Utah and the degree to which these effects would be mitigated or avoided are described in Section 3.2.8.4. After application of selective mitigation measures discussed in Section 3.2.8.4, the level of impacts on special status wildlife and their potential habitats in Utah under Alternative COUT-I are presented in Table 3-123 and displayed on maps MV-10a, MV-11a, and MV-12a. The resources contributing to the high, moderate, and low impacts are the same the same for Alternative COUT-I as Alternative COUT-C. Alternative COUT-I would have the least high residual impacts compared to other COUT alternative routes and similar moderate residual impacts compared to other COUT routes in Utah (Table 3-123).

Results of Additional Analysis of Potential Impacts

Birds

Special Status Raptors and Migratory Birds

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Alternative COUT-I in Utah is located within 1 mile of known raptor nests (Table 3-121). Additional raptor nests are likely to be located within 1 mile of Alternative COUT-I. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of mitigation measures are described in Section 3.2.8.4.

Some loss of riparian vegetation along the White River and its tributaries in Uintah County that may provide suitable habitat for yellow-billed cuckoos could occur despite the implementation of temporal and spatial avoidance mitigation measures. If yellow-billed cuckoos use riparian habitats affected by Alternative COUT-I, loss of riparian vegetation could result in a decrease in habitat connectivity and a potential decrease in the number of effective yellow-billed cuckoo territories along the White River and its in Uintah County. Alternative COUT-I would result in less loss of potential yellow-billed cuckoo habitat than Alternatives COUT-A, COUT-B, COUT-C, and COUT-H in Utah (Table 3-124).

Alternative COUT-I in Utah would result in the same effects on potential mountain plover habitat as Alternatives COUT-C and COUT-H as the three routes follow the same alignment through mountain plover potential habitat (Table 3-124),

Mexican spotted owls are not known to occupy the potential habitat crossed by this alternative route in the Argyle Ridge and Coal Creek areas south of the Roan Cliffs in Carbon County, though no formal surveys have been completed (Wright 2012). If Mexican spotted owls are detected during preconstruction surveys, mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of the clearing of trees for safe operation of the transmission line. Alternative COUT-I would result in modification of more of potential Mexican spotted owl habitat than Alternatives COUT-A, COUT-B, COUT-C, and COUT-H in Utah (Table 3-124).

Special Status Upland Game Birds

Some of the impacts on sage-grouse associated with Alternative COUT-H in Utah would occur in areas where the alternative is parallel to an existing high-voltage transmission line (345kV steel-lattice structure) that has degraded the existing quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would meet BLM's goals of minimizing sage-grouse habitat loss and fragmentation (BLM WO-IM 2012-043). However, Alternative COUT-I also would affect sage-grouse habitats that have not experienced the adverse effects of anthropogenic development. The estimated area of sage-grouse occupied habitat, affected statewide by Alternative COUT-A is presented in Table 3-120 and the extent of habitat affected in each Utah population crossed in presented in Table 3-126.

Alternative COUT-I crosses sage-grouse habitat within 4 miles of active leks located in priority habitats used by Deadman's Bench and Emma Park populations. Areas within 4 miles of leks are presumably the most important areas for maintaining individual and statewide sage-grouse populations in Utah. Habitats affected by this alternative route and used by the Emma Park sage-grouse populations are in a sage-grouse management area identified by the State of Utah to protect, maintain, improve, and enhance sage-grouse populations and habitats (State of Utah 2013a). This alternative route would occur within 4 miles of leks attended by approximately half of the male sage-grouse in the Emma Park population. Leks within 4 miles of Alternative COUT-I have greater attendance by sage-grouse compared to leks within 4 miles of Alternative COUT-A; thus, this alternative route would affect leks that presumably have higher importance for maintaining statewide sage-grouse populations than leks within 4 miles of Alternative COUT-A.

The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-I during the past 5 years and percentage of the average Utah statewide sage-grouse male lek counts that this represents are presented in Table 3-127. The average number of male sage-grouse that have been counted on leks located within 4 miles of Alternative COUT-I in each affected population during the past 5 years and percentage of the average population wide sage-grouse male lek counts that this represents is presented in Table 3-128.

Mammals

The effects of Alternative COUT-I on black-footed ferret are described in detail in Section 3.2.8.4 and would be the same as Alternative COUT-C (Table 3-120), as the two routes follow the same alignment through the Coyote Basin reintroduction management area. Alternative COUT-I crosses the same extent of black-footed ferret management area as Alternatives COUT-C and COUT-H, and more than COUT-A and COUT-B in Utah.

Alternative COUT-I would affect the same amount of potential white-tailed prairie dog potential colonies as Alternatives COUT-C, and COUT-H and more than Alternatives COUT-A and COUT-B in Utah (Table 3-120). White-tailed prairie dog potential colonies crossed are adjacent to existing human development and linear infrastructure and are likely to have previously incurred some of the effects described in Section 3.2.8.4. The effects of Alternative COUT-I on white-tailed prairie dog potential colonies could be reduced, relative to areas where transmission line structures are absent, in areas where the alternative would be adjacent to the existing 345kV steel lattice transmission line.

Implementation of Alternative COUT-I likely would result in impacts on individuals in prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex due to the high density of prairie dog occupancy in this area. Approval of Alternative COUT-I would require BLM to grant an exception, modification, or waiver to management stipulations identified in the BLM Vernal Field Office RMP prohibiting surface disturbance or construction of permanent aboveground structures within 660 feet of prairie dog colonies in the Coyote Basin white-tailed prairie dog sub-complex. Implementation of Design Features 3, 26, 27, 28, and 30 would reduce the level of potential effects on white-tailed prairie dogs in this area.

If exceptions to CSU stipulations identified in the BLM Vernal Field Office RMP were granted, BLM would require additional mitigation measures to reduce potential effects on white-tailed prairie dogs in the Coyote Basin sub-complex. Mitigation could include micro siting the transmission line to avoid areas of high prairie dog densities or co-locating the transmission line with existing transmission lines in prairie dogs colonies to the extent practicable (Selective Mitigation Measures 2 and 7), altering transmission line structure type and installing perch deterrents to reduce raptor predation on prairie dogs (Selective Mitigation Measures 6 and 14), or other measures implemented in accordance with agency requirements. A qualitative discussion of the potential residual effects on white-tailed prairie dogs that could occur even with application of mitigation measures are described in Section 3.2.8.4.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-I would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Special Status Wildlife Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to special status wildlife resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-I would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest wide population trends for all MIS species in the Project area.

3.2.8.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A is located on the Wyoming/Colorado state line in sagebrush, grassland, and pinyon-juniper habitat. In Wyoming, the Powder Wash series compensation station siting area contains potential mountain plover and pygmy rabbit habitats, white-tailed prairie dog colonies, and greater sage-grouse

general habitat. Habitats within 4 miles of leks that are not located in core and priority sage-grouse habitat would also occur in Siting Area A.

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover and pygmy rabbit habitats, white-tailed prairie dog colonies, and greater sage-grouse general habitat as well as habitats within 4 miles of leks located outside core and priority sage-grouse habitats that could occur from construction of a series compensation station within Siting Area A is included in the analysis of potential disturbance that could occur from implementation of Alternative WYCO-B, and its route variations (Table 3-106).

Construction of a series compensation station in potential mountain plover and pygmy rabbit habitats and white-tailed prairie dog colonies could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., mitigation measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area A also could occur.

A description of potential impacts on greater sage-grouse associated with impacts on general habitat and habitats within 4 miles of leks is included in Sections 3.2.8.4.3 and 3.2.8.5. Activities related to the construction and maintenance of the Powder Wash Series Compensation Station could result in loss or alteration of sage-grouse general habitat. However, impacts on habitats within 4 miles of leks would be avoided to the extent practicable through final site selection of the series compensation station. Construction of the series compensation station within sage-grouse habitat could affect sage-grouse habitat use and behavior due to the effects of noise and human presence associated with construction and operation of the series compensation site. Additionally, fences constructed around the series compensation station could provide perching structures for avian predators and could increase in predation pressure on sage-grouse using habitats adjacent to the series compensation station. The station would not be located in core or priority sage-grouse habitats and areas within 4 miles of leks would be avoided to the extent practicable. Core and priority habitats and areas within 4 miles of leks are the most important habitats for maintaining sage-grouse populations After the application of Selective Mitigation Measures 12, 13, and 14 (seasonal and spatial wildlife restrictions, overland access, and perch deterrents) impacts on greater sage-grouse would be limited to localized loss and modification of sage-grouse habitat and potential changes in sage-grouse behavior and habitat use resulting from increased noise and human presence, and localized increases in avian predation pressure.

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B is located where Alternative WYCO-B and route variations diverge in Nine Mile Basin in Colorado. Siting Area B is located in sagebrush, grassland, and pinyon-juniper habitat, which is located in potential mountain plover, yellow-billed cuckoo, and pygmy rabbit habitats as well as greater sage-grouse general habitats. Siting Area B also contains white-tailed prairie dog colonies. Habitats within 4 miles of leks that are not located in core and priority sage-grouse habitat would also occur in Siting Area B.

Siting Area B is located in the Routt and Moffat County Uplands BHCA in Colorado which is an important area for Columbian sharp-tailed grouse as the sagebrush, pinyon-juniper, and desert scrub vegetation communities along the Little Snake River support the largest population in Colorado.

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover and pygmy rabbit habitats, white-tailed prairie dog colonies, and greater sage-grouse general habitat as well as habitats within 4 miles of leks located outside core and priority sage-grouse habitats that could occur from construction of a series compensation station within the Nine Mile Basin Series Compensation Station Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative WYCO-B and route variations (Table 3-106).

Construction of a series compensation station in potential mountain plover and pygmy rabbit habitats and white-tailed prairie dog colonies could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area B also could occur.

A description of potential impacts on greater sage-grouse associated with impacts on general habitat and habitats within 4 miles of leks is included in Sections 3.2.8.4.3 and 3.2.8.5. Activities related to the construction and maintenance of the Nine Mile Basin series compensation station could result in loss or alteration of sage-grouse general habitat. However, impacts on habitats within 4 miles of leks would be avoided to the extent practicable through final site selection of the series compensation station. Construction of the series compensation station within sage-grouse habitat could affect sage-grouse habitat use and behavior due to the effects of noise and human presence associated with construction and operation of the series compensation site. Additionally, fences constructed around the series compensation station could provide perching structures for avian predators and could increase in predation pressure on sage-grouse using habitats adjacent to the series compensation station. The station would not be located in core or priority sage-grouse habitats and areas within 4 miles of leks would be avoided to the extent practicable. Core and priority habitats and areas within 4 miles of leks are the most important habitats for maintaining sage-grouse populations. After the application of Selective Mitigation Measures 12, 13, and 14 (seasonal and spatial wildlife restrictions, overland access, and perch deterrents) impacts on greater sage-grouse would be limited to localized loss and modification of sage-grouse habitat and potential changes in sage-grouse behavior and habitat use resulting from increased noise and human presence, and localized increases in avian predation pressure.

Siting Area C – Maybell

Affected Environment

In Colorado, Siting Area C would be located where Alternative WYCO-B and route variations diverge in the Tuttle Ranch Conservation Easement area. Special status wildlife habitats in this siting area include riparian, agricultural, big sagebrush, shrub/shrub steppe, barren/sparsely vegetated, grassland, and pinyon-juniper vegetation communities. Siting Area C would be located in potential mountain plover and pygmy rabbit habitats, white-tailed prairie dog colonies, and greater sage-grouse general habitats. Habitats within 4 miles of leks inside and outside core and priority sage-grouse habitat would also occur in Siting Area C.

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover and pygmy rabbit habitats, white-tailed prairie dog colonies, and greater sage-grouse general habitat as well as habitats within 4

miles of leks located outside and inside core and priority sage-grouse habitats that could occur from construction of a series compensation station within the Maybell Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative WYCO-C and route variations (Table 3-106).

Construction of a series compensation station in potential mountain plover and pygmy rabbit habitats and white-tailed prairie dog colonies could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area C also could occur.

A description of potential impacts on greater sage-grouse associated with impacts on general habitat and habitats within 4 miles of leks is included in Sections 3.2.8.4.3 and 3.2.8.5. Activities related to the construction and maintenance of the Maybell Series Compensation Station could result in loss or alteration of sage-grouse general habitat. However, impacts on habitats within 4 miles of leks would be avoided to the extent practicable through final site selection of the series compensation station. Construction of the series compensation station within sage-grouse habitat could affect sage-grouse habitat use and behavior due to the effects of noise and human presence associated with construction and operation of the series compensation site. Additionally, fences constructed around the series compensation station could provide perching structures for avian predators and could increase in predation pressure on sage-grouse using habitats adjacent to the series compensation station. The station would not be located in core or priority sage-grouse habitats and areas within 4 miles of leks would be avoided to the extent practicable. Core and priority habitats and areas within 4 miles of leks are the most important habitats for maintaining sage-grouse populations. After the application of Selective Mitigation Measures 12, 13, and 14 (seasonal and spatial wildlife restrictions, overland access, and perch deterrents) impacts on greater sage-grouse would be limited to localized loss and modification of sage-grouse habitat and potential changes in sage-grouse behavior and habitat use resulting from increased noise and human presence, and localized increases in avian predation pressure.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

In Colorado, Siting Area D would be located in wildlife habitat that includes sagebrush, shrub/shrub steppe and pinyon-juniper vegetation communities just south of U.S. Highway 40, west of Craig. Siting Area D would be located in potential yellow-billed cuckoo habitat, white-tailed prairie dog colonies, and greater sage-grouse general habitat. Habitats within 4 miles of leks inside and outside core and priority sage-grouse habitat would also occur in Siting Area D.

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover and yellow-billed cuckoo habitats, white-tailed prairie dog colonies, and greater sage-grouse general, core and priority habitats as well as habitats within 4 miles of leks located inside and outside core and priority sage-grouse habitats that could occur from construction of a series compensation station within the Bell Rock Series Compensation Station Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative WYCO-B, and its route variations (Table 3-106).

Construction of a series compensation station in potential mountain plover and yellow-billed cuckoo habitats, white-tailed prairie dog colonies, and greater sage-grouse general, core and priority habitats, as well as habitats within 4 mile of leks located inside and outside core and priority habitats could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area D also could occur.

A description of potential impacts on greater sage-grouse associated with impacts on general habitat and habitats within 4 miles of leks is included in Sections 3.2.8.4.3 and 3.2.8.5. Activities related to the construction and maintenance of the Bell Rock Series Compensation Station could result in loss or alteration of sage-grouse general habitat. However, impacts on habitats within 4 miles of leks would be avoided to the extent practicable through final site selection of the series compensation station. Construction of the series compensation station within sage-grouse habitat could affect sage-grouse habitat use and behavior due to the effects of noise and human presence associated with construction and operation of the series compensation site. Additionally, fences constructed around the series compensation station could provide perching structures for avian predators and could increase in predation pressure on sage-grouse using habitats adjacent to the series compensation station. The station would not be located in core or priority sage-grouse habitats and areas within 4 miles of leks would be avoided to the extent practicable. Core and priority habitats and areas within 4 miles of leks are the most important habitats for maintaining sage-grouse populations. After the application of Selective Mitigation

Measures 12, 13, and 14 (seasonal and spatial wildlife restrictions, overland access, and perch deterrents) impacts on greater sage-grouse would be limited to localized loss and modification of sage-grouse habitat and potential changes in sage-grouse behavior and habitat use resulting from increased noise and human presence, and localized increases in avian predation pressure.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E

Siting Area G – Green River

Affected Environment

The Siting Area G would be located in an area previously disturbed by the I-70 corridor and U.S. Highway 6; approximately 5 miles west of the Green River. Wildlife habitat is predominantly barren, and shrub/shrub-steppe habitat, interspersed with pinyon juniper. The Green River Siting Area would be located in potential yellow-billed cuckoo and southwestern willow flycatcher habitats, and white-tailed prairie dog colonies.

Environmental Consequences

The estimated area of disturbance (in acres) to yellow-billed cuckoo and southwestern willow flycatcher habitats and white-tailed prairie dog colonies that could occur from construction of a series compensation station within the Green River Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative COUT BAX-B (Table 3-115).

Construction of a series compensation station in potential yellow-billed cuckoo and southwestern willow-flycatcher habitats and white-tailed prairie dog colonies could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific

responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area G also could occur.

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

In Utah, Siting Area F would be located in an area previously disturbed by agriculture and U.S. Highway 40 in the vicinity of Roosevelt. Wildlife habitat is predominantly agricultural land, barren, sagebrush and shrub/shrub-steppe vegetation communities. The Roosevelt Siting Area would be located in potential mountain plover and yellow-billed cuckoo habitats, and white-tailed prairie dog colonies.

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover and yellow-billed cuckoo habitats and white-tailed prairie dog colonies, and greater sage-grouse general habitat as well as habitats within 4 miles of leks located outside core and priority sage-grouse habitats that could occur from construction of a series compensation station within the Roosevelt Series Compensation Station Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative COUT-A and Route Variation COUT-A-1 (Table 3-124).

Construction of a series compensation station in potential mountain plover and yellow-billed cuckoo habitats and white-tailed prairie dog colonies could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area F also could occur.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

In Utah, Siting Area E would be located in an area previously disturbed by oil and gas development, and the Bonanza Power Plant. Wildlife habitat is predominantly sagebrush and shrub/shrub-steppe. The Bonanza Series Compensation Station Siting Area would be located in potential mountain plover, yellow-

billed cuckoo, and black-footed ferret habitats as well as white-tailed prairie dog colonies. Habitats within 4 miles of leks inside core and priority sage-grouse habitat would also occur in Siting Area E.

Siting Area E is located in sagebrush habitats associated with the Deadman's Bench sage-grouse population which contains two leks (Refer to Section 3.2.8.5. under the Utah Affected Environment section of Alternative COUT-A for a detailed description of the Deadman's Bench sage-grouse population).

Environmental Consequences

The estimated area of disturbance (in acres) to potential mountain plover, yellow-billed cuckoo, and black-footed ferret habitats, white-tailed prairie dog colonies, and greater sage-grouse core and priority habitats as well as habitats within 4 miles of leks located inside core and priority sage-grouse habitats that could occur from construction of a series compensation station within the Bonanza Series Compensation Station Siting Area is included in the analysis of potential disturbance that could occur from implementation of Alternative COUT-C and its route variations (Table 3-124).

Construction of a series compensation station in potential mountain plover, yellow-billed cuckoo, and black-footed ferret habitats and white-tailed prairie dog colonies and greater sage-grouse core and priority habitats could result in potential direct and indirect effects identified in Section 3.2.8.4.3. After the application of relevant design features (e.g., Design Features 3, 6, 7, and 27; management of special status species, seasonal restrictions for nesting migratory birds, breeding bird and nest surveys, construction vehicle movement restriction) and selective mitigation measures (e.g., Selective Mitigation Measure 12 seasonal and spatial wildlife restrictions) impacts on these special status wildlife habitat and individuals would include localized loss and modification of habitat. Potential changes in special status wildlife behavior due to individual and species-specific responses to anthropogenic disturbance as a result of increased noise, human presence and construction activities associated with construction of a series compensation station in Siting Area E also could occur.

A description of potential impacts on greater sage-grouse associated with impacts on general habitat and habitats within 4 miles of leks is included in Sections 3.2.8.4.3 and 3.2.8.5. Activities related to the construction and maintenance of the Bonanza Series Compensation Station could result in loss or alteration of sage-grouse general habitat. However, impacts on habitats within 4 miles of leks would be avoided to the extent practicable through final site selection of the series compensation station. Construction of the series compensation station within sage-grouse habitat could affect sage-grouse habitat use and behavior due to the effects of noise and human presence associated with construction and operation of the series compensation site. Additionally, fences constructed around the series compensation station could provide perching structures for avian predators and could increase in predation pressure on sage-grouse using habitats adjacent to the series compensation station. The station would not be located in core or priority sage-grouse habitats and areas within 4 miles of leks would be avoided to the extent practicable. Core and priority habitats and areas within 4 miles of leks are the most important habitats for maintaining sage-grouse populations. After the application of Selective Mitigation Measures 12, 13, and 14 (seasonal and spatial wildlife restrictions, overland access, and perch deterrents) impacts on greater sage-grouse would be limited to localized loss and modification of sage-grouse habitat and potential changes in sage-grouse behavior and habitat use resulting from increased noise and human presence, and localized increases in avian predation pressure.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.

3.2.9 Fish and Aquatic Resources

3.2.9.1 Introduction and Regulatory Framework

The Fish and Aquatic Resources section addresses potential impacts on fish and aquatic species, including special status fish and aquatic species potentially affected by the proposed Project, the No Action Alternative and various Alternative Routes, during the construction, operation, and maintenance of the Project. Special status fish and aquatic species are those federally listed as either endangered, threatened, or candidates for protection under the ESA or those considered sensitive by the BLM or USFS.

3.2.9.1.1 Regulatory Framework

Implementation of the Project would be consistent with statutes, regulations, plans, programs, and policies of affiliated tribes, federal agencies, and state and local governments.

Regulations that directly influence fish and aquatic species decisions in the Project area are implemented by the FWS, BLM, USFS, and state wildlife agencies including the WGFD, CPW, CDOW, and the UDWR. Relevant regulations that the Project must comply with for special status fish and aquatic species as well as game fish are presented below.

Federal

- BLM Manual 1120: These provide policy and direction regarding fish and wildlife management on BLM administered lands.
- BLM Manual 6840: These provide BLM policy and direction concerning Sensitive Species.
- BLM RMPs Management Framework Plans for the Rawlins (2008) Field Office in Wyoming; for Colorado, including White River (1997, as amended), Little Snake (1989, as amended), and Grand Junction (1987, as amended) Field Offices; for Utah, including Richfield (2008), Fillmore (1987), Moab (2008), Price (2008) and Vernal (2008) Field Offices, and Salt Lake District (1990), specify regulations and goals for management of BLM-administered lands and set restrictions to protect fish and wildlife and the habitats on which they depend.
- The ESA (16 U.S.C. 1531 et. seq.), as amended, provides broad protection for species of fish, wildlife, and plants listed as threatened or endangered by the FWS. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. All federal agencies in consultation with and with the assistance of the FWS also must use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species. All federal agencies, in consultation with, and with the assistance of, the FWS must ensure any action authorized, funded, or carried out by federal agency is not likely to jeopardize the continued existence of an endangered, threatened, or proposed listed species, or result in destruction or adverse modification of a critical habitat of a species. Agencies are required to use the best scientific and commercial data available to fulfill this charge.

- Executive Order 11990 of 1977: This Executive Order requires agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the beneficial values of wetlands.
- FLPMA, as amended, consolidates and articulates BLM and USFS management responsibilities and governs most uses of the federal lands, including authorization to grant or renew rights-of-way. In accordance with FLPMA, BLM and USFS must make land use decisions based on principles of multiple use and sustained yield. As such, a grant of right-of-way must be limited to its necessary use and must contain terms and conditions that reflect the agencies' management responsibilities under FLPMA, including minimizing impacts on fish and wildlife habitat.
- The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution. Growing public awareness and concern for controlling water pollution led to sweeping amendments in 1972. As amended in 1977, the law became commonly known as the CWA, codified generally as 33 U.S.C. 1251 et. seq. The CWA's objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Individual sections of the Act maintain and protect the nation's water resources.
- The Fish and Wildlife Coordination Act of 1934: Based on this act, fish and wildlife resources receive equal consideration with other resources in water resource development programs.
- Fish and Wildlife Coordination Act of 1956. 43 CFR 24.6 "By reason of the Congressional policy of state-federal cooperation and coordination in the area of fish and wildlife conservation, State and Federal agencies have implemented cooperative agreements for a variety of fish and wildlife programs on Federal Lands". Utah has entered into conservation agreements with several federal agencies for the conservation and management of several sensitive species that occur within the project area.
- The Platte River Recovery Implementation Program, established in 1997, implements actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the states of Wyoming, Nebraska, and Colorado, as well as the USDI. The Platte River Recovery Implementation Program addresses the adverse impacts of existing and certain new water-related activities on the Platte River target species and associated habitats, and provides ESA compliance for effects on the target species.
- The Multiple-Use, Sustained-Yield Act of 1960, as amended: This act recognizes, and clarifies, USFS authority and responsibility regarding the management of fish and wildlife.
- The Organic Administrative Act of 1897, as amended: This act recognizes watersheds as systems to be managed with care, to sustain their hydrologic function.
- USFS LRMPs, as amended, for the Ashley (1986), Manti-La Sal (1986), and Uinta (2003) National Forests identify goals for forest health and constraints on resource use to meet these goals. LRMPs also identify project restrictions to protect fish and wildlife and MIS for each forest.
- USFS Manual 2670 directs each Regional Forester to designate sensitive species on public lands administered by USFS. Per the manual, sensitive species are defined "as plant or animal species identified by a Regional Forester for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce an existing distribution of the species."
- *Upper Colorado Endangered Fish Recovery Program*, under this program, any amount of water removed from the Colorado River system is considered to be a depletion of water, and amounts

greater than 0.1 acre-feet/year require formal consultation with the FWS for downstream impacts on threatened and endangered species.

State

Wyoming

- Wyoming State Code Section 23-1-101 defines 'wildlife' as all wild mammals, birds, fish, amphibians, reptiles, crustaceans and mollusks, and wild bison designated by the Wyoming game and fish commission and the Wyoming livestock board in the state.
- Wyoming State Code Section 23-1-103 of the Wyoming State Code states all wildlife is the property of the state of Wyoming; and directs the control, propagation, management, protection and regulation of wildlife in the state.
- Wyoming State Code Section 23-1-302 empowers the Wyoming game and fish commission to manage big game hunting seasons, take and areas in the state; and to develop, improve and maintain lands and waters for the management and protection of all wildlife.
- Wyoming Game and Fish Commission, Chapter 52, Section 9 indicates that all nongame wildlife and fish can only be taken from licensed lands and waters.
- The Wyoming SWAP 2005 and revised in 2010 is a coordinated, comprehensive conservation strategy designed to maintain the health and diversity of wildlife, including species with low and declining populations in the state of Wyoming.

Colorado

- Colorado State Code Statute 23-2-101 provides the State's intent to protect wildlife in the state of Colorado under the Nongame, Endangered, or Threatened Species Conservation Act.
- Colorado State Code Statute 23-2-104 regulates the take, possession, transportation, exportation, processing, sale or offering for sale, or shipment as may be deemed necessary to manage nongame wildlife in the state.
- Colorado Revised Statute 33-1-101 prohibits the taking, hunting, or possession of animals deemed property of the state or wildlife taken in violation of state, federal, or non-U.S. law (including bald and golden eagles). It is also illegal to have in one's possession any nonnative or exotic species.
- The Colorado SWAP 2006 is a comprehensive management strategy developed by Colorado Division of Wildlife and the state of Colorado to conserve native species populations and habitats, and prevent additional federal listings.

Utah

- Utah State Code Section 23-15-2 establishes that all wildlife including but not limited to wildlife on public or private land or in public or private waters in the State, falls in the jurisdiction of the UDWR. Utah Code Ann. 23-15-2 and 23-13-3 (Repl. Vol. 1991).
- Utah State Code Section 23-14-1 of the Utah State Code directs the UDWR to protect, propagate, manage, conserve, and distribute protected wildlife throughout the state. This statute also authorizes UDWR to identify and delineate crucial seasonal wildlife habitats.
- Utah State Code Section 23-14-18 of the Utah State Code provides for the establishment of hunting/fishing seasons, locations and harvest limits.

- Utah State Code Section 23-14-19 establishes that the Wildlife Board shall exercise its powers by making rules and issuing proclamations and orders pursuant to this code.
- Utah State Code Title 23-22-1 indicates the UDWR may enter into cooperative agreements and programs with other state agencies, federal agencies, states, educational institutions, municipalities, counties, corporations, organized clubs, landowners, associations, and individuals for purposes of wildlife conservation." All parties to this Agreement recognize that they each have specific statutory responsibilities that cannot be delegated, particularly with respect to the management and conservation of wildlife, its habitat and the management, development and allocation of water resources. Nothing in this Agreement or Strategy is intended to abrogate any of the parties' respective responsibilities. This Agreement is subject to and is intended to be consistent with all applicable federal and state laws and interstate compacts.
- UAC R657-48 directs the UDWR to maintain a Utah Sensitive Species List that identifies plant and animal species (1) listed, or candidates for listing, pursuant to the ESA; (2) for which a conservation agreement is in place; or (3) whose population viability is threatened in Utah (i.e., wildlife species of concern). Timely and appropriate conservation actions implemented on behalf of species listed on the Utah Sensitive Species List will preclude the need to list these species
- Utah Comprehensive Wildlife Conservation Strategy directs the integration and implementation of ongoing and planned management actions that will conserve native species and thereby prevent the need for additional listings under the ESA. The regulatory framework for protection of fish and aquatic resources provides that State agencies (i.e., WGFD, CPW, and UDWR) manage aquatic species. The FWS would have jurisdiction over the management of ESA-listed aquatic species, and that BLM would continue to assist in managing aquatic habitats in coordination with the FWS and appropriate state wildlife agencies.

3.2.9.2 Issues Identified for Analysis

Potential effects on fish and aquatic resources resulting from construction, operation, and maintenance of the proposed Project are summarized in Table 3-129.

TABLE 3-129
FISH AND AQUATIC RESOURCE ISSUES IDENTIFIED FOR ANALYSIS

Issue Identified	Analysis Considerations
Potential impacts on federally listed threatened, endangered, proposed, and candidate fish species: ▪ Direct and indirect loss of habitat ▪ Direct and indirect impacts on individuals ▪ Short- and long-term impacts on populations	▪ Determining proximity of critical habitat to Project rights-of-way ▪ Determining proximity of known populations to Project rights-of-way ▪ Conducting qualitative analyses of direct and indirect threats to individuals and habitat from Project activities
Potential impacts on Bureau of Land Management and U.S. Forest Service sensitive fish, aquatic species, and conservation species: ▪ Direct and indirect loss of habitat ▪ Direct and indirect impacts on individuals ▪ Short- and long-term impacts on populations	▪ Determining proximity of known or potential habitat to Project rights-of-way ▪ Determining proximity of known populations to Project rights-of-way ▪ Conducting qualitative analyses of direct and indirect threats to individuals and habitat from Project activities
Potential impacts on game fish and other aquatic organisms: ▪ Direct and indirect loss of habitat ▪ Direct and indirect impacts on individuals ▪ Short- and long-term impacts on populations	▪ Determining proximity of known or potential habitat to Project rights-of-way ▪ Determining proximity of known populations to Project rights-of-way ▪ Conducting qualitative analysis of direct and indirect threats to individuals and habitat from Project activities

3.2.9.3 Regional Setting

The Project area spans 3 states, 6 ecoregions, and 23 subbasins. In these drainage areas, 10 major rivers including the Medicine Bow, Little Snake, White, Green, Yampa, North Platte, Price, Duchesne, San Pitch, and Uinta rivers are crossed by Project alternative routes (USGS 2009a). Additionally, numerous perennial and intermittent streams potentially supporting fish and aquatic resources are crossed by Project alternative routes. Section 3.2.4 provides a summary of streams, lakes, reservoirs, ponds, and other aquatic habitats present in the Project area and describes how they are spatially recognized through the HUC system.

3.2.9.3.1 Aquatic Habitats

The geographic scope of analysis for this section is 1 mile on either side of reference centerline and includes critical habitats designated for federally listed endangered fish species and general habitats supporting BLM, USFS, and state-listed sensitive species, game fish, and other aquatic species (described later in this section). Aquatic habitats identified in the Water Resources section (Section 3.2.4) are assumed to have the potential to support fish and/or aquatic species. Therefore, those waters are being included in this discussion and will be analyzed as aquatic habitats. The geographic scope of analysis for Water Resources consisted of a 300-foot buffer on either side of a reference centerline. This buffer width was chosen because 300 feet is the most conservative avoidance buffer regulating ground-disturbing activities on federal lands. The buffer width is derived from the Utah BLM Riparian Policy (BLM 2010a) and was agreed to be a sufficient scope of analysis by agency representatives during the interdisciplinary team meetings.

The geographic scope of analysis for fish and aquatic resources (resources identified within 1 mile on either side of alternative route reference centerlines) as well as Water Resources (resources identified within 300 feet of alternative reference centerline) are hereafter referred to as the alternative route study corridors. Aquatic habitats identified in the alternative route study corridors include a mixture of streams, lakes, ponds, reservoirs, springs, wetlands, and riparian areas that support or have the potential to support aquatic species. These water resources can be grouped into three habitat categories for this analysis: lentic habitats, lotic habitats, and wetland habitats. Lentic and lotic habitats were derived from the NHD (USGS 2010a). Wetland habitats consist of a combination of the National Wetlands Inventory (FWS 2012a) and the Southwest Regional Gap Analysis Project (SWReGAP) dataset (USGS 2010c).

<u>Lotic Habitats</u>

Lotic waters are characterized by having flowing water in a state of continual physical change (Giller and Malmqvist 1998). Lotic waters in the alternative route study corridors include rivers, perennial streams, and intermittent streams and show a large range of variability mainly due to variations in terrain, aspect, geology, and precipitation specific to the drainage areas from which they originate (refer to Section 3.2.4 for classification of lotic waters). At a finer scale, lotic habitats exhibit a high degree of spatial and temporal heterogeneity (microhabitats) that support a wide variety of biotic (living) interactions amongst plants, animals and micro-organisms, as well as abiotic (nonliving) physical and chemical interactions (Campbell et al. 2009).

Lotic habitats in the alternative route study corridors typically support cold-water fish and aquatic species. The greatest diversity of fish and aquatic species found in the alternative route study corridors, including game fish, non-game fish, amphibians, invertebrates and those listed as endangered and sensitive, are found in cold water lotic habitats.

As previously mentioned, lotic habitats include both perennial and intermittent streams. Because all fish species with the potential to occur in the alternative route study corridors require a perennial source of

water for all or most of their life, it can be assumed that most intermittent streams in the Project area do not support fish species. However, intermittent streams do provide habitats for a number of amphibians and invertebrates during all or part of their life cycle.

Lentic Habitats

Lentic habitats are characterized by having standing or relatively still water contained in a closed or semi-closed impoundment. Lentic habitats in the Project area include lakes, reservoirs, and ponds (refer to Section 3.2.4 for classification of lentic waters). There are many lentic habitats occurring in the alternative route study corridors ranging from high alpine lakes in the Big Sandy, Blacks Fork, and Duchesne subbasins; to warm water lakes and ponds of the Little Snake and Lower Green river subbasins. Lentic habitats support a wide variety of fish and aquatic species including those species requiring cold water habitats and those that require warm water habitats.

Wetland Habitats

Wetland habitats are found throughout the Project area and include wetlands identified in the NWI database and riparian areas identified in the SWReGAP database. These habitats are dependent on a consistent and usually perennial source of hydrology such as shallow groundwater, surface water, springs, seeps, or an anthropogenic source such as irrigation. Wetland and riparian habitats support a high level of structural diversity. These habitats are used by a multitude of avian and terrestrial wildlife as well as fish, amphibians, and invertebrates. For an in depth discussion of the type, classification, distribution, and relative abundance of wetlands in the alternative route study corridors refer to Section 3.2.5.

3.2.9.4 Study Methodology

Information presented in this section includes (1) descriptions of fish and aquatic resource-specific data collected for the analysis, (2) temporal and geographic scope of analysis, (3) discussion of resource vulnerability and potential effects resulting from the Project, and (4) evaluation of the level of these effects, the degree to which these effects can be mitigated, and where residual effects may potentially occur. Results of the analysis are presented in Section 3.2.9.5.

3.2.9.4.1 Inventory

Detailed information was collected from various sources to provide a database of critical habitats, general habitats, species occurrences, and spatial layers for fish and aquatic resources in the alternative route study corridors.

Background data were collected from the following sources:

- WYNDD, CNHP, and Utah Natural Heritage Program
- BLM and USFS land and resource management plans
- BLM, USFS, and state fisheries and aquatic resource databases
- The Watershed Boundaries Database and the NHD
- FWS National Wetlands Inventory
- USGS 1:24,000 topographic maps
- Personal communications with local, state, and federal resource specialists.
- Project description, including design features of the Proposed Action for environmental protection

Natural history information for special status fish, amphibian, and invertebrate species were collected from NatureServe, WWF Wildfinder, and IUCN Red List. General descriptions of habitats requirements,

distribution, and special status designation for special status fish and aquatic species considered for this analysis are presented in this section. For detailed life histories of special status fish and aquatic species analyzed in the Project area, refer to Appendix E.

In total, 86 federal or state-listed special status fish and aquatic species were evaluated for the potential to occur in the alternative route study corridors (Appendix E). Forty-two species were eliminated from further consideration due to a lack of suitable habitat or because documented occurrences of those species are absent. Of the remaining federal or state-listed special status fish and aquatic species, 43 have been documented in or have potentially suitable habitat in the alternative route study corridors, including 26 fish, 6 amphibians, and 11 aquatic invertebrates. Of the 43 fish and aquatic species being analyzed, 10 fish and 3 aquatic invertebrate species inhabit the Platte River. As proposed, the Project would not cross any known or suitable habitat for the Platte River species. These fish and invertebrates are included in the analysis by request of the BLM resource specialists in Wyoming pursuant the Wyoming State Action Plan for Platte River fish that requires projects potentially drawing water from the Platte River and its tributaries disclose potential impacts from water draw-down. A summary of the listing status, habitat, and general distribution for each species being carried forward for analysis is detailed in Table E-9.

Federally Listed Threatened, Endangered, and Candidate Fish

Four federally listed fish species occur in the alternative route study corridors. These species include the bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius,)* razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*). One additional federally listed species and one candidate species occur in proximity to (but not in) the alternative route study corridors, the pallid sturgeon (*Scaphirhynchus albus*) and the least chub (*Iotichthys phlegethontis*). These species are being carried forward in this analysis due to the potential for indirect effects on individuals or suitable habitats. Table E-9 includes species listed under the ESA and their federally listed status.

Endangered Species

Bonytail

Bonytail were historically common in warm-water reaches throughout the Colorado River and its larger tributaries. Bonytail inhabit mainstem riverine habitats of the Colorado River and tributaries with a strong preference for deep pools and eddies with slow to fast currents (Kaeding et al. 1986). Today, there are no known populations in Colorado. Currently, bonytail are documented to occur in the Green, White, and Yampa rivers in Utah and Wyoming, and as a recent capture confirms, in Utah's Strawberry Reservoir (CPW 2012k).

The FWS designated seven reaches of the Colorado River system as critical habitat for the species, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin, totaling 312 miles of critical habitat for the species (59 FR 13374).

Colorado Pikeminnow

Colorado pikeminnow occur in six rivers in the alternative route study corridors: Green, Yampa, Little Snake, White, Price, and Duchesne rivers. Alternative routes considered for the Project cross designated critical habitat for Colorado pikeminnow in the Yampa, Green, and White rivers in Colorado and Utah. Known spawning areas for the species are located in the Three Fords Canyon and Gray Canyon reaches of the Green River (Carbon and Uintah counties, Utah) and the lower 20 miles of the Yampa River (Moffat County, Colorado).

The FWS designated six reaches of the Colorado River System as critical habitat, including portions of the Colorado, Green, Yampa, White, and San Juan rivers, totaling 1,148 miles of critical habitat for the species (59 FR 13374).

Humpback Chub

Humpback chub mainly occur in river canyons where they use a variety of habitats including deep pools, eddies, upwells near boulders, and areas near steep cliff faces. Young and spawning adults are generally found in sandy runs and backwaters (FWS 2002a). Currently, there are six known self-sustaining populations. Five occur in the Upper and one on the Lower Colorado Basin Recovery Units. No known self-sustaining populations exist in the alternative route study corridors but potentially suitable habitat is present. Thus, this species is carried forward in the analysis.

The FWS designated seven reaches of the Colorado River system as critical habitat including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and portions of the Colorado and Little Colorado rivers in the Lower Basin, totaling 379 miles of critical habitat for the species (59 FR 13374).

Razorback Sucker

Razorback Sucker is endemic to the Colorado River Basin, found primarily in Utah. Historically, razorback sucker was widely distributed and abundant in the Colorado River and major tributaries from Utah to northern Mexico.

In the alternative route study corridors, razorback sucker is found in the Green and Yampa rivers. Designated critical habitat in the Green, Yampa, Duchesne, and White rivers also occurs in the alternative route study corridors (FWS 2002b).

Pallid Sturgeon

Pallid sturgeon was listed as endangered in 1990 (55 FR 36641) and a recovery plan was published in 1993 (Dryer and Sandvol 1993); however, critical habitat has not been designated for this species. Pallid sturgeon is included in the analysis due to the consideration of potential water depletions in the Platte River drainage during construction of the Project. Alternative routes of the proposed Project do not cross habitat for this species. This species occurs in the Lower Platte River downstream of the mouth of the Elkhorn River. Pallid sturgeon is a bottom-dweller that prefers areas with strong current and firm sandy bottoms in the main channel of large turbid rivers.

Candidate Species for Federal Listing

Least Chub

The least chub is typically found in association with moderate to dense vegetation and in areas with moderate to no current (Sigler and Miller 1996). Substrates of ponds containing least chub are generally composed of silt and organic material; occasionally substrates will include clays. Least chub have historically occurred in these habitats with wide distribution in the Bonneville Basin of northwestern Utah. Least chub have been observed in the Beaver River, Provo River, tributaries of the Great Salt Lake, Sevier Lake and Utah Lake.

The species is now limited to the Snake Valley of the Bonneville Basin, occurring on a mixture of federal, state, and private lands at five locations. Three populations are in the Snake Valley in Utah's West Desert and two are located on the eastern border of the native range near the Wasatch Range in the Sevier River drainage where the least chub prefers areas of dense vegetation in slow-moving waters with muddy substrates (Bailey et al. 2005; FWS 2012c).

Least chub known populations are not crossed by alternative routes for the proposed Project. However, there are occurrences of the species north of Nephi, Utah near the Burraston Ponds and associated wetland complex. Tributaries of these waters are crossed by Project alternative routes; thus, this species will be carried forward for analysis in this section.

Species Petitioned for Federal Listing

Boreal toad (*Bufo boreas boreas)* and Columbia spotted frog (*Rana luteiventris)* are petitioned for listing under the ESA and are identified by the BLM, USFS, and states as special status species, and will be further described in the following section.

BLM, USFS, and State-Listed Sensitive Species

Special Status Fish Species

Fifteen BLM, USFS, and State-listed special status fish are found in lentic and lotic aquatic habitats in the Project area. Known occurrences and status are listed in Table 3-130; species accounts are included in Appendix E. Two trout species including the Bonneville cutthroat trout (*Oncorhynchus clarkii Utah)* and Colorado River cutthroat (*Oncorhynchus clarkii pleuriticus*) trout are listed by the BLM, USFS, and the states of Utah, Wyoming, and Colorado as sensitive species with existing conservation agreements. Additionally, bluehead sucker (*Castostomus discobolus*), flannelmouth sucker (*C. latipinnis*), and roundtail chub (*Gila robusta*) have existing conservation easements in Utah and are listed sensitive species. These five trout species are the only sensitive fish species with known occurrences in the study corridor and will be carried forward for analysis.

Bluehead Sucker

The bluehead sucker is a BLM sensitive species in Wyoming, Colorado, and Utah as well as a state-listed sensitive species in Wyoming and Utah. Bluehead sucker occur in mountain streams and large rivers that are often turbid or muddy and sometimes alkaline. It is usually found in swift currents but has been found in moderate to still water with very little vegetation (UDWR 1998). Current known distribution of the bluehead sucker includes the Little Snake (Carbon County) and Green (Sweetwater County) river drainages in Wyoming; the Little Snake and Green (Moffatt County), White (Rio Blanco County), and Colorado (Mesa County) river drainages in Colorado; and the Colorado River drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), San Rafael (Emery County), Price (Carbon County), and White (Uintah County) rivers in Utah (UDWR 1998). The bluehead sucker is threatened by habitat alteration and loss, introduction of exotic fishes, and hybridization with other species of sucker (UDWR 1998). Populations of the species may be declining (UDWR 1998; WGFD 2010c). Reference centerlines are located within the known range of the bluehead sucker in Wyoming, Colorado, and Utah. The bluehead sucker is known to occur in the Project area.

Bonneville Cutthroat Trout

The Bonneville cutthroat trout is listed with BLM and USFS as a sensitive species. This trout species is managed under a conservation agreement in Utah which is a voluntary cooperative plan among several resource management agencies designed to identify and resolve threats to the species (Lentsch et al. 2000). The goal of the Conservation Agreement is to significantly reduce or eliminate the threats to the Bonneville cutthroat trout that may eventually cause it to be federally listed.

Colorado River Cutthroat Trout

The Colorado River cutthroat trout is a BLM, USFS, and state-listed sensitive species in Colorado, Utah, and Wyoming (Colorado River Cutthroat Trout Coordination Team 2006).

Historically the Colorado River cutthroat trout occupied portions of the Colorado River drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico (Behnke 2002). Conservation populations of this species are known to be present in streams and lakes located in five river basins in the alternative route study corridors: Upper and Lower Colorado, Upper and Lower Green, and Yampa river basins.

Flannelmouth Sucker

The flannelmouth sucker is a BLM sensitive species in Wyoming, Colorado, and Utah as well as a state-listed sensitive species in Wyoming and Utah. Flannelmouth sucker inhabit pools or streams and large rivers with little to no vegetation and clear to murky waters over rock, gravel, or mud substrate. The species was once widespread throughout the Colorado River basin but currently occupies only 45 percent of its historic range (WGFD 2010c). Threats to the species include habitat fragmentation and competition and hybridization with non-native fishes (WGFD 2010c). Current known distribution of the flannelmouth sucker includes the Little Snake (Carbon County) and Green (Sweetwater County) river drainages in Wyoming; the Little Snake and Green (Moffatt County) and Colorado (Mesa County) river drainages in Colorado; and the Colorado River drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), San Rafael (Emery County), and Price (Carbon County) rivers in Utah (UDWR 1998). Some reference centerlines are located in the known range of the flannelmouth sucker in Wyoming, Colorado, and Utah and the species is known to occur in the Project area.

Roundtail Chub

The roundtail chub is a BLM sensitive species in Wyoming, Colorado, and Utah as well as a state-listed sensitive species in Wyoming and Utah. Roundtail chub are endemic to rivers and streams in the Colorado River drainage (Bosworth 2003). The species is threatened by fragmentation and loss of habitats and competition and predation by nonnative species. Roundtail chub currently occupy 45 percent of their historic range in the Colorado River Basin (WGFD 2010c). Current known distribution of the roundtail chub includes the Little Snake (Carbon County) and Green (Sweetwater County) river drainages in Wyoming (WGFD 2005a), the Little Snake, Green (Moffatt County), and Colorado (Mesa County) river drainages in Colorado; and the Colorado River Drainage including the Colorado (Grand County), Green (Uintah, Emery, and Grand counties), and San Rafael (Emery County) rivers in Utah (UDWR 1998). Reference centerlines are located in or cross the known range of the roundtail chub in Wyoming, Colorado, and Utah. The species is likely to be present in the Project area. One known occurrence is crossed by the centerline of Link U400 where this link crosses the White River.

Southern Leatherside Chub

The southern leatherside chub (*Lepidomeda aliciae*) is a BLM- and USFS-listed sensitive fish species and a Utah state-listed species of concern. The southern leatherside chub is a small minnow native to streams and rivers of the southeastern portion of the Bonneville Basin. Observations of introduced leatherside chub populations have been found in the Strawberry, Green, and Fremont rivers within the Upper Colorado River Basin (UDWR 2010b). In Utah, the current known distribution includes Utah Lake, the Sevier and San Pitch River drainages as well as Soldier and Thistle creeks (UDWR 2010b). Reference centerlines are located within the known range of the southern leatherside chub in Utah and contain suitable habitat. The species is known to occur in the Project area.

Special-status Amphibian Species

Five BLM, USFS, and/or state-listed amphibian species are known to occur or have the potential to occur in lentic, lotic, and wetland habitats in the alternative route study corridors. These species include the boreal toad, Columbia spotted frog, Great Basin spadefoot toad (*Spea intermontana)*, northern leopard frog (*Rana pipiens*), and wood frog (*Lithobates sylvaticus)*. The Project area is in the known or predicted

ranges for the Great Basin spadefoot toad and wood frog but no occurrences of these species were identified in the alternative route study corridors and thus are not carried forward for detailed analysis. Conservation agreements for the boreal toad, Columbia spotted frog, and northern leopard frog exist in Utah, and occurrences of these species have been documented in the alternative route study corridors; therefore, these three species are carried forward for detailed analysis. Detailed species descriptions, life history, and occurrence information for these species is included in Appendix E.

Boreal Toad

The boreal toad is listed as a special status species by the BLM, USFS, and by the state governments in all three states crossed by the Project. This species underwent a 12-month review for listing by the FWS under the ESA. Findings of the review indicated the species was not warranted for protection under the ESA. The southern Rocky Mountain population of this species occurs from south-central Wyoming southward through the mountainous regions of Colorado and into north-central New Mexico. The toads inhabit a variety of wet habitats including marshes, wet meadows, streams, beaver ponds, glacial tarns, and lakes interspersed in subalpine forests above 8,600 feet above mean sea level.

Potentially suitable habitat for boreal frog is located near or is crossed by the alternative route study corridors. Natural Heritage data includes four records of this species within 1 mile of the alternative routes for the proposed Project area. Surveys conducted by UDWR in 2008 investigated suitable habitats in the Project area but individuals were not found. Surveys outside of but in proximity to the Project area resulted in detecting individuals in the Strawberry Reservoir area (UDWR 2008b).

Columbia Spotted Frog

The Columbia spotted frog is a BLM and USFS sensitive species in Wyoming, Colorado, and Utah. In Utah, the species is managed under a conservation agreement which was established in 2005 (Bailey et al. 2006). Habitat for the Columbia spotted frog includes perennial lentic and lotic aquatic habitats along the San Pitch River near Mount Pleasant, north of Fairview, and the West Creek area south of Mona, Utah. Alternative routes considered for the Project cross or are in proximity to suitable habitat for this species.

Northern Leopard Frog

The northern leopard frog, a BLM sensitive species and a state-listed special status species in Wyoming and Colorado, was petitioned for listing under the ESA. Following a 12-month review in 2011, the FWS concluded that protection under the ESA was not warranted (FWS 2011i). The current distribution of the northern leopard frog includes portions of Wyoming, Colorado, and Utah (FWS 2012d).

Habitat for the northern leopard frog includes slow-moving or still water in streams and rivers, wetlands, permanent or temporary pools, beaver ponds, as well as earthen stock tanks and borrow pits. The northern leopard frog is experiencing threats from loss of habitat, disease such as chytrid fungus, introduction of non-native, predatory fish (i.e., bass, pike, etc.) and amphibian (bull frog [*Rana catesbeiana*]) species, discharges of point and non-point pollutants and subsequent reductions in water quality. Alternative routes for the proposed Project crosses and are in proximity to known habitat for this species.

Special Status Aquatic Invertebrates

Initially, 13 special status aquatic invertebrate species were identified as potentially occurring in the Project area. Following an analysis of known occurrence data, it was determined that two special status aquatic invertebrate species are known to occur in the alternative route study corridors, the Eureka Mountain snail (*Oreohelix eurekensis)* and the Southern Bonneville springsnail (*Pyrgulopsis transversa*) both Utah-listed species of special concern. The remaining 11 special status aquatic invertebrate species

have either limited habitat or are not known to occur in the alternative route study corridors. These species are being carried forward for further analysis because suitable habitat for the species is present in portions of the alternative route study corridors and individuals are likely to occur in those habitats.

Game Fish

Analysis of potential impacts of the Project on game fish species is an important inclusion for the analysis of aquatic species in the Project area due to their recreational and economic values as well as the potential effects they could have on other aquatic species. However, spatial data was not made available by the cooperating agencies during the inventory process and game fish will be analyzed on the basis of suitable habitat rather than known occurrences in the study corridor. Game fish species identified in the Project area can be broken into two general categories: cold-water fishes and warm-water fishes. Table 3-130 summarizes the game fish species known to occur or likely to occur in the alternative route study corridors.

TABLE 3-130
GAME FISH KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Habitat
Cold-water Game Fish		
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	Streams, lakes/reservoirs
Brook trout	*Salvelinus fontinalis*	Streams, lakes/reservoirs
Brown trout	*Salmo trutta*	Streams, lakes/reservoirs
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	Streams, lakes/reservoirs
Cutthroat trout	*Oncorhynchus clarki*	Streams, lakes/reservoirs
Mountain whitefish	*Prosopium williamsoni*	Streams
Rainbow trout	*Oncorhynchus mykiss*	Streams, lakes/reservoirs
Snake River cutthroat trout	*Oncorhynchus clarki bouvieri*	Streams, lakes/reservoirs
Kokanee salmon	*Oncorhynchus nerka*	Streams, lakes/reservoirs
Tiger trout (brown x brook hybrid)	*Salmo trutta* x *Salvelinus fontinalis*	Streams, lakes/reservoirs
Warm-water Game Fish		
Black bullhead	*Ameiurus melas*	Lakes/reservoirs
Black crappie	*Pomoxis nigromaculatus*	Lakes/reservoirs
Bluegill	*Lepomis macrochirus*	Lakes/reservoirs
Channel catfish	*Ictalurus punctatus*	Streams, lakes/reservoirs
Green sunfish	*Lepomis cyanellus*	Lakes/reservoirs
Largemouth bass	*Micropterus salmoides*	Lakes/reservoirs
Rock bass	*Ambloplites rupestris*	Lakes/reservoirs
Smallmouth bass	*Micropterus dolomieu*	Streams, lakes/reservoirs
White bass	*Morone chrysops*	Lakes/reservoirs
Wiper (striped x white bass hybrid)	*Morone saxatilis* x *Morone chrysops*	Lakes/reservoirs
Northern pike	*Esox lucius*	Lakes/reservoirs
Walleye	*Sander vitreus*	Streams, lakes/reservoirs
Yellow perch	*Perca flavescens*	Streams, lakes/reservoirs
Smelt	*Osmerus* sp.	Lakes/reservoirs

Other Aquatic Organisms

Non-game Fish

Non-game fish species found in the Project area include suckers, darters, and minnows. Sucker species, family *Catostomidae*, occur in stream or river habitats and include species such as longnose (*C. catostomus*), mountain (*C. platyrhynchus*), white (*C. commersonii*), and desert (*C. clarkia*) suckers. Darter species, family *Percidae*, occur in the Project area and include the Iowa darter (*Etheostoma exile*)

and Johnny darter (*E. nigrum*). Minnow species, family *Cyprinidae,* occur in the Project area and include the red shiner (*Cyprinella lutrensis*), brassy minnow (*Hybognathus hankinsoni*), common carp (*Cyprinus carpio*), creek chub (*Semotilus atromaculatus*), emerald shiner (*Notropis atherinoides*), sand shiner (*N. stramineus*), fathead minnow (*Pimephales promelas*), longnose dace (*Rhinichthys cataractae*), speckled dace (*R. osculus*), redside shiner (*Richardsonius balteatus*), southern leatherside chub (*G. copei*), Utah chub (*G. atraria*), and Virgin spinedace (*Lepidomeda mollispinis*).

Amphibians

Aquatic habitats located in the Project area support amphibians including salamanders, toads, and frogs. Amphibian species require aquatic and semi-aquatic habitats for breeding and often use adjacent terrestrial habitats during nonbreeding periods. Salamander and toad species use burrows and other moist areas in terrestrial habitat to overwinter. Most frog species overwinter in the bottom substrates of their aquatic habitats. Amphibians likely to occur in the Project area include the northern leopard frog (*Rana pipiens*), spotted toad (*B. punctatus*), western toad (*B. boreas*), Woodhouse's toad (*B. woodhousii*), Great Basin spadefoot toad (*Spea intermontana*), and Couch's spadefoot toad (*Scaphiopodidae couchii*).

Invertebrates

Species composition and relative abundance data for invertebrates are not required for the impact analysis. However, a discussion of aquatic habitats and fish without consideration of invertebrate communities potentially occurring in the aquatic habitats crossed by the Project would leave this discussion incomplete. Therefore, the following information is presented to discuss the aquatic invertebrates potentially inhabiting aquatic habitats in the study corridor.

Invertebrate communities are present throughout the year in all perennial waters in the Project area. Invertebrate occurrence in intermittent or ephemeral waters would be limited to the period when water is present. Aquatic invertebrates often provide crucial forage for wildlife, fish, amphibians, and predatory invertebrates. Not only are they crucial elements of the food chain, aquatic invertebrates, and especially macro-invertebrates can be used as an indicator of water quality given their distribution, and abundance in a water body (Barbour et al. 1999; Wallace and Webster 1996).

Approximately 40 aquatic invertebrate species (including the 10 special status species) are known to occur or are likely to occur in the Project area based on review of available literature (Appendix E). A feature common to all aquatic invertebrate species is their dependence on aquatic habitats for all or a part of their life cycle. Common aquatic invertebrate species found in the Project area include but are not limited to the following: micro-invertebrate arthropod species such as water fleas, water bears, water mites, freshwater shrimp, midge larva, hydras, and annelids (leeches); macro-invertebrate species such as true flies *(Diptera)*, mayflies *(Ephemeroptera)*, stoneflies *(Plecoptera)*, and caddisflies *(Tricoptera)*; mollusks including gastropods (snails) and bivalves (mussels and clams); and numerous crustaceans with the most notable being crayfish.

Aquatic Invasive Species

Aquatic invasive species are non-native animals, fish, plants and pathogens that have a harmful effect on endemic fish and aquatic species. Aquatic invasive species were defined in 2008 by the Colorado State Legislature as any exotic or nonnative wildlife or any plant species that have been determined to pose a significant threat to aquatic resources or water infrastructure of the state.

The introduction of aquatic invasive species into an established ecosystem can alter or disrupt existing relationships and ecological processes. Aquatic invasive species are capable of out-competing and even displacing native species usually because of their ability to grow faster and out produce native species,

effectively out competing them for light, nutrients and space. The most destructive aquatic invasive species known from the Project area, the zebra and quagga mussels, not only pose a threat to the natural aquatic habitat they are introduced to, but they also cause severe damage to infrastructure such as dam structures, mooring facilities, irrigation structures, etc. which have been shown to result in substantial costs in the monitoring and removal of those species. As of August 2012, aquatic invasive species are known to inhabit waters in the states of Colorado and Utah. There are no known infestations of aquatic invasive species in Wyoming. The major aquatic invasive species threatening waters in the Project area are summarized in Table 3-131.

TABLE 3-131
AQUATIC INVASIVE SPECIES OF PARTICULAR CONCERN TO COLORADO, UTAH, AND WYOMING

Common Name	Scientific Name	Species Notes
Plants		
Eurasian watermilfoil	*Myriophyllum spicatum*	Known to occur in Colorado[1] and Utah[2]
Water hyacinth	*Eichornia crassipes*	Known to occur in Colorado
Purple loosestrife	*Lythrum salicaria*	Known to occur in Colorado and Utah
Animals		
Burbot	*Lota lota*	Known to occur in Utah
Rusy crayfish	*Orconectes rusticus*	Known to occur in Colorado
Quagga mussel	*Dreissena bugensis*	Known to occur in Colorado and Utah
Zebra mussel	*Dreissena polymorpha*	Known to occur in Colorado and Utah
New Zealand mudsnail	*Potamopyrgus antipodarum*	Known to occur in Colorado and Utah
Pathogens		
Whirling disease		Known to occur in Colorado and Utah
Septicemia virus		Known to occur in Colorado and Utah

NOTES:
[1]Colorado Lakes and Reservoirs Management Association 2012
[2]National Invasive Species Information Center 2012

3.2.9.4.2 Impact Assessment and Mitigation Planning

For an interdisciplinary comparison of alternative routes and analysis of other potential effects, the methodology for assessing potential impacts generally included (1) identifying the types of potential effects on fish and aquatic resources that could result from construction, operation, and maintenance of the proposed transmission line and associated facilities, (2) determining initial impacts on fish and aquatic resources present in the study corridors, (3) identifying appropriate selective mitigation measures for minimizing some potential adverse effects and determining specific areas where selective mitigation measures should be applied, and (4) disclosing level of potential residual impacts on fish and aquatic resources (i.e., impacts anticipated after application of selective mitigation measures). Design Features of the Proposed Action for environmental protection (Table 2-8) were considered when assessing both initial and residual impacts. Additional discussion of the methods used in analyzing effects of the Project on fish and aquatic resources to support interdisciplinary comparison of alternative routes are discussed in the Effects Analysis section.

Supplemental analyses were deemed necessary to address some of the issues raised by the public and the agencies during scoping. Quantitative or qualitative analyses were performed, depending on information available, to evaluate potential impacts of the Project on fish and aquatic resources, or to meet the requirements of relevant law, regulation, or policy. The methods for these supplemental analyses are discussed in the Effects Analysis section.

Types of Potential Effects

The degree of potential effects on fish and aquatic resources resulting from construction, operation, and maintenance of the Project would depend largely on each resource's particular vulnerability to Project-related disturbance. The apparent vulnerability of fish and aquatic resources as well as the susceptibility of their habitats to Project-related disturbance was a primary attribute used to assess potential effects and the extent of those effects on fish and aquatic resources. Additionally, the proximity of Project-related disturbance and the spatial orientation (i.e., upstream or downstream) of that disturbance also plays a role in determining the type and degree of potential effects on fish and aquatic resources. For example, impacts occurring directly to occupied habitat and those impacts occurring upstream of occupied habitat for any fish or aquatic species would have a greater effect on those individuals than if impacts were to occur in uplands adjacent to occupied habitat or impacts occurring downstream of occupied habitat.

Types of potential effects on fish and aquatic species were identified based on guidance from federal and state agency biologists, public scoping, and literature reviews of the effects which similar projects have had on fish and aquatic resources. Through those interactions with the public, cooperating agencies, and with peers; it is apparent that impacts on fish and aquatic resources must include both direct effects and indirect effects. These effects are anticipated to be the same for special status species, game fish species, and other aquatic organisms.

Impacts on federally listed fish species would differ depending on the alternative route being analyzed namely because not every alternative would affect federally listed fish. Quantification of impacts on federally listed fish species as well as the qualification of level of residual impacts will be detailed in the results section (Section 3.2.9.5) for each alternative that crosses critical habitat and for those routes within 1 mile of critical habitats and/or occurrences.

Impacts on BLM, USFS, and state-listed sensitive fish and aquatic species inhabiting lentic, lotic, and wetland habitats in the alternative route study corridors would result from construction, operation, and maintenance of the Project. Impacts on these species are detailed in the results section (Section 3.2.9.5).

Impacts on game fish and other aquatic organisms would be expected to result from construction, operation, and maintenance of the Project. Data specific to game fish has not been made available for analysis at this time. Therefore, a qualitative analysis of impacts on aquatic habitats potentially supporting game fish and other aquatic organisms is included in the results section (Section 3.2.9.5) and is intended to identify potential impacts on game fish and other aquatic organisms secondarily as a function of those species' habitat requirements.

Where the Project corridor encounters critical habitat or occurrences of federally listed special status species, occurrences of BLM, USFS, or state-listed sensitive species, or potential habitat for game fish and other aquatic organisms; initial impacts would be reduced through proper implementation of selective mitigation measures. Where avoidance is not possible and implementation of selective mitigation measures impracticable; impacts would consist of permanent loss of individuals, loss of suitable habitat, and reductions in population fecundity and long-term species viability.

Direct Effects

Direct effects on fish and aquatic resources would include mortality of individuals and direct removal of aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats resulting from construction, operation, and maintenance permanent Project facilities including but not limited to permanent access roads, ancillary facilities, fiber optic lines, series compensation stations, and transmission line towers (i.e., individuals crushed by vehicles and grading or blading activities that permanently remove habitat).

Construction of temporary Project facilities could require crossing numerous lotic habitats; potentially a few lentic habitats; and few, if any wetland or riparian habitats supporting sensitive fish and/or aquatic species. Often, these crossings require the placement of fill material (e.g., log bunks, crane pads, rock, soil, bridge pilings, culverts, wing walls, etc.) to provide a structure sufficient to support construction equipment and materials while at the same time reducing potential environmental impacts including those potential impacts on fish and aquatic species as well as their associated aquatic and semi-aquatic habitats. Typically, temporary stream crossings would be used to cross aquatic habitats with little to no stream flow; where a crossing would only be needed for the construction phase of the Project; or where existing streambed substrate would support construction, operation, and maintenance related traffic. Types of temporary stream crossings would include (1) dry crossings with no bank or channel improvement; (2) mechanically grading banks to a slope sufficient to drive equipment and building materials across the channel (bank recontouring and revegetation would follow the work at the temporary crossing); (3) placement of temporary fill that would be removed following the completion of work at the site; or (4) temporary span structures. While temporary, these crossings would have the potential to affect stream morphology and ecological function but typically for only a short duration.

Indirect Effects

Indirect effects on fish and aquatic resources resulting from construction, operation, and maintenance, of the Project could occur as a result of activities that increase the probability of erosion near aquatic habitats and subsequent sedimentation to those habitats as well as those activities that result in short-term modification of habitats supporting fish, aquatic, and semi-aquatic species.

Ground-disturbing activities which alter natural channel morphology, substrate composition, and stability; and those activities which would compact or decompact soils or remove riparian vegetation in proximity to fish and aquatic habitats could result in increased sediment loads, removal of water filtering and shading vegetation (wetlands or riparian vegetation), accidental spills of environmentally harmful materials (fuel, oil, concrete, etc.), and/or introduction of aquatic invasive species. All indirect effects would result in a reduction in fish and aquatic species fitness, reproductive potential (fecundity), survivability, and long-term adaptability.

Surface disturbance associated to the construction of temporary Project facilities which require crossing lotic, lentic, wetland, and/or riparian habitats supporting fish and other aquatic or semi-aquatic species could result in the type of indirect effects mention previously. Often, these crossings require the placement of temporary and permanent fill material (e.g., log bunks, crane pads, rock, soil, bridge pilings, culverts, wing walls, etc.) to provide a structure sufficient to support construction equipment and materials while at the same time minimizing environmental impacts including impacts on fish, aquatic, and semi-aquatic species as well as their associated habitats.

Research has shown that road construction and maintenance activities such as the clearing of stream-side vegetation, recontouring of channels, and vehicular travel through streams increased stream temperature and reduced dissolved oxygen content as suspended solids absorb heat from sunlight. Temperatures greater than 21 degrees Celsius (70 degrees Fahrenheit) can severely stress most cold-water fish and aquatic species (Wood and Armitage 1997).

Where temporary stream crossings are needed, modification of stream banks for temporary crossings could require the removal of vegetation that could take many years to recover depending on the plant species present, creating the potential for long-term bank erosion and sedimentation of aquatic habitats depending on site-specific conditions.

Generally, indirect effects on fish and aquatic resources would be short duration and can be mitigated by proper implementation of design features, selective mitigation measures, and reclamation following ground-disturbing activities.

Mitigation Planning and Effectiveness

Design Features of the Proposed Action

Design Features of the Proposed Action (Table 2-8) are measures incorporated into the Project description by the Applicant and employed Project-wide to reduce the potential for initial impacts on occur. Design features effective at reducing impacts on fish and aquatic resources include Design Features 3, 26, 27, 28, 30, 33, and 34.

- **Design Feature 3 (management of special status species)**. Special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with management policies set forth by appropriate land-management or wildlife-management agencies (e.g., BLM, USFS, FWS, state wildlife agencies, etc.). In cases where such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat. Avoidance measures may include altering the placement of roads or towers, adjustments to route alignment, and monitoring activities where practicable as approved by the landowner and Construction Inspection Contractor. This design feature would avoid areas of particular concern due to the inhabitation of special status species or critical habitats reducing the potential for indirect and/or direct effects on special status fish and aquatic resources.
- **Design Feature 26 (vehicle access restriction)**. All construction vehicle movement outside the right-of-way would be restricted to pre-designated access, contractor-acquired access, public roads, or overland travel approved in advance by the applicable land-management agency to reduce impacts on aquatic resources and upland adjacent to those resources. Special status species, threatened and endangered species, or other species of particular concern would be considered in accordance with management policies set forth by appropriate land-management or wildlife-management agencies (e.g., BLM, USFS, FWS, state wildlife agencies, etc.). This design feature would reduce traffic in areas susceptible to erosion and sedimentation to aquatic habitats supporting fish and aquatic resources.
- **Design Feature 27 (construction activity access restriction)**. All Project-related construction activities would be limited to a predetermined spatial extent. This design feature will minimize the likelihood that construction, operation, and maintenance related activities would result in direct or indirect impacts on fish and aquatic resources by limiting the proximity of those activities to sensitive aquatic habitats.
- **Design Feature 28 (personnel instruction)**. All Project personnel would be instructed in the importance, purpose, necessity, and regulations of protection of natural resources. Instruction will also be given for reporting and stop work procedures in the event of a resource conflict. This will minimize impacts on fish and aquatic resources throughout the Project corridor, but especially in areas where aquatic habitats or special status species were not previously known to occur prior to commencement of construction.
- **Design Feature 30 (hazardous materials restrictions)**. - Hazardous materials would be contained and removed to a disposal facility, and not drained into the ground, streams, or drainages. This design feature would be used to prevent exposure of aquatic habitats to harmful materials and would minimize the potential for direct and indirect impacts on fish and aquatic resources resulting from Project activities.
- **Design Feature 33 (riparian area avoidance)**. Refueling and storing potentially hazardous materials would be prohibited within a 100-foot radius of a water body, a 200-foot radius of all

identified private water wells, and a 400-foot radius of all identified municipal or community water wells. Spill preventive and containment measures or practices would be incorporated as needed.

Consistent with BLM Riparian Management Policy, ground-disturbing activities within 328 feet (100 meters) of a riparian area would be required to meet exception criteria defined by BLM, such as acceptable measures to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species. Mitigation measures would be developed on a site-specific basis, in consultation with the BLM or USFS, and incorporated into the POD. If disturbance was anticipated within 20 feet of the edge of a riparian area or other wetland habitat, a silt fence or certified weed-free wattle would be installed along the travel route on the wetland side unless the wetland is up-gradient.

- **Design Feature 34 (invasive species avoidance).** Project activities would adhere to interagency developed methods of avoidance, inspection, and sanitization as described in the *Operational Guidelines for Aquatic Invasive Species Prevention and Equipment Cleaning* (USFS 2009a). If control of fugitive dust near sensitive water bodies were necessary, water would be obtained from treated municipal sources or drafted from sources known to contain no aquatic invasive species. Support vehicles, drill rigs, water trucks and drafting equipment would be inspected and sanitized, as needed, following interagency-approved operational guidelines.

Selective Mitigation Measures

In addition Design Features of the Proposed Action for environmental protection, selective mitigation measures would be implemented to reduce potential high or moderate impacts on fish and aquatic species. The selective mitigation measures applicable to reducing residual impacts on fish and aquatic resources include Selective Mitigation Measures 2, 5, 7, and 11, which are described in the following bulleted list.

- **Selective Mitigation Measure 2 (Sensitive Resource Avoidance)**. There will be no blading of new access roads in certain areas of sensitive resources (e.g., perennial streams, riparian areas, wetlands) during construction (or maintenance). In these particular areas, existing access (if available) will be used to cross water resources and aquatic habitats and existing or overland access routes are to be used for construction and maintenance in these select areas. Every crossing would be identified and a crossing plan developed to minimize residual impacts on water resources and associated aquatic habitats. To minimize ground disturbance, subsequent erosion and sedimentation, overland routes would be flagged with easily seen markers and the route must be approved in advance.
- **Selective Mitigation Measure 5 (Minimize New or Improved Accessibility)**. All new or improved access (e.g., blading, widening existing access) not required for maintenance would be closed or rehabilitated using the most effective and least environmentally damaging methods, appropriate to that area and developed through consultation with the landowner or land-management agency. Limiting access to construction areas would reduce the likelihood that post construction use of roads by the general public would persist following development of new or improved access. Reducing traffic on newly disturbed sites will reduce the resulting erosive attributes associated with traffic (soil compaction, decompaction, rutting, etc.). Methods for road closure or management include installing and locking gates, obstructing the path (e.g., earthen berms, boulders, redistribution of woody debris), revegetating and mulching the surface of the roadbed to make it less apparent, restoring the road to its natural contour and vegetation or constructing waterbars to ensure proper drainage.
- **Selective Mitigation Measure 7 (Span and/or Avoid Sensitive Features)**. Within the limits of standard tower design and in conformance with engineering and Applicant requirements;

structures would be located to allow conductors to clearly span identified sensitive features. Structures would be placed so as to avoid sensitive features, including, but not limited to, wetlands, riparian areas, aquatic habitats and occurrences of special status aquatic species. Avoidance measures may include selective tower placement, spanning sensitive features, or realigning access routes.

- **Selective Mitigation Measure 11 (Minimize Right-of-Way Clearing)**. Clearing of the right-of-way would be minimized to avoid sensitive features including, but not limited to, wetlands, aquatic habitats, occurrences of special status aquatic species, areas of steep slopes and fragile soils, etc. In select areas, the right-of-way width may be modified (within the limits of PacifiCorp Vegetation Management Standards and standard tower design) to protect sensitive resources, but current land uses would be allowed to continue unabated, provided the use meets applicable standards.

3.2.9.4.3 Effects Analysis

Methods for Analysis to Support Interdisciplinary Comparison of Alternative Routes

Criteria for Assessing Level of Impacts

Criteria were developed in collaboration with the Agency Interdisciplinary Team to assess the level of a potential adverse effect on federally listed threatened and/or endangered aquatic species associated with implementation of the Project. Criteria developed to assess the level of impacts were based on considerations of fish and aquatic resource vulnerability to impacts; relative fish and aquatic species population abundance, magnitude of anticipated impacts; additional protections including state laws and statutes; and existing conditions. Table 3-132 describes the criteria developed for assessing level of impacts on fish and aquatic species.

TABLE 3-132
CRITERIA FOR ASSESSING LEVEL OF IMPACTS ON FISH AND AQUATIC SPECIES

Level of Impacts	Description
High	▪ Impacts that would severely limit the long-term sustainability of populations (e.g., impacts on only known population) ▪ Loss or adverse modification of occupied habitat or large portions of suitable habitat for local species ▪ Loss or adverse modification of designated critical habitat
Moderate	▪ Impacts that would have adverse effects on aquatic species but would not severely limit the long-term sustainability of populations (e.g., impacts on fish or aquatic species populations somewhat more widely distributed than local species) ▪ Loss or adverse modification of small portions of unoccupied suitable habitat for local species
Low	▪ Impacts that would have only minor adverse effects on species and would not limit the long-term sustainability of populations (e.g., indirect effects or impacts in areas of pre-existing disturbance) ▪ Indirect effects or disturbance in areas of pre-existing disturbance
Nonidentifiable	▪ Locations where effects on fish and aquatic resources would be completely mitigated following implementation of selective mitigation measures

Initial Impacts

Initial impacts are those effects resulting from the implementation of the Project, including Design Features of the Proposed Action for environmental protection (refer to the subheading Mitigation Planning and Effectiveness in Section 3.2.9.2). Initial impacts were assigned to federally listed threatened

and endangered fish and aquatic species for a quantitative analysis of impacts on those species. The quantitative approach to assess initial impacts on federally listed threatened and endangered fish and aquatic species is based on the criteria presented in Table 3-132.

Residual Impacts

Residual impacts represent anticipated impacts on federally listed fish and their habitats following implementation of selective mitigation measures described (refer to the subheading Mitigation Planning and Effectiveness in Section 3.2.9.2). The level of potential residual impacts on federally listed fish and their habitats associated with implementation of the Project was assessed using the criteria presented in Table 3-132. Implementation of selective mitigation measures is expected to reduce the level of expected impacts on federally listed fish and their habitats (e.g., moderate initial impacts would be expected to decrease to a low rating following implementation of selective mitigation measures) as follows:

- Avoiding sensitive resources such as designated critical habitat or aquatic habitats upstream from critical habitat (Selective Mitigation Measure 2)
- Minimizing new or improved accessibility and reducing the potential for new access roads or upgrading existing roads, especially where such actions could result in indirect effects on designated critical habitat (Selective Mitigation Measure 5)
- Spanning and/or avoiding sensitive features such as critical habitat or areas where ground disturbance could result in adverse effects on designated critical habitat (Selective Mitigation Measure 7)
- Minimizing, to the extent practicable, right-of-way clearing, especially in proximity to designated critical habitat (Selective Mitigation Measure 11)

Application of these selective mitigation measures individually or in conjunction with others applicable to fish and aquatic resources, specifically to habitats designated as critical to the continued existence of federally listed species, would provide the Applicant with options and tools that would enable the Project to move forward while simultaneously protecting vulnerable species and their habitats.

Methods for Additional Analysis of Potential Impacts

In addition to the analysis conducted to facilitate an interdisciplinary comparison of alternative routes, additional analyses were required to adequately address some issues raised by the public and the agencies during scoping regarding potential impacts on special status fish and aquatic resources or to meet the requirements of relevant law, regulation, or policy.

Element occurrence data from state natural heritage programs were used to determine the presence of federally listed species as well as BLM, USFS, and state-listed sensitive species in the alternative route study corridors. Numbers of element occurrences (hereafter occurrences) in these areas will be reported in text, instead of total populations or numbers of individuals as these data are often not recorded consistently between observers or states. Number of occurrences for each species will be reported for each alternative route by state.

Sufficient data for game fish and other aquatic organisms occurring in the alternative route study corridors could not be obtained for use in this analysis. However, game fish and other aquatic organisms are expected to occur in aquatic habitats found in the alternative route study corridors. The number of aquatic habitats potentially supporting game fish and other aquatic organisms will be reported for each alternative route by state.

Design features and selective mitigation measures pertinent to Project effects on fish and aquatic resources; initial impacts resulting from Project activities; selective mitigation measures employed to reduce the level of initial impacts, and residual impacts on critical habitats supporting the Colorado River endangered fishes are summarized in Table 3-133.

TABLE 3-133
SUMMARY OF INITIAL AND RESIDUAL IMPACTS ON FISH AND AQUATIC SPECIES

Fish and Aquatic Resources	Design Feature of the Proposed Action Relevant to Fish and Aquatic Resources	Initial Impact	Selective Mitigation Measure	Residual Impact
Resources Identified for Interdisciplinary Comparison of Alternative Routes				
Federally listed fish	26, 27, 28, 30	Moderate	2, 5, 7, 11	Low
Resources Identified for Additional Analysis				
Sensitive fish	3, 26, 27, 28, 30	Low	2, 5, 7, 11	Nonidentifiable impact
Sensitive amphibians	3, 26, 27, 28, 30	Low	2, 5, 7, 11, 12	Nonidentifiable impact
Game fish	26, 27, 28, 30	Low	2, 5, 7, 11	Nonidentifiable impact
Other aquatic species	26, 27, 28, 30	Low	2, 5, 7, 11, 12	Nonidentifiable impact

3.2.9.5 Results

3.2.9.5.1 No Action Alternative

Under this alternative, the environment would remain as it presently exists.

3.2.9.5.2 Impacts Common to All Action Alternatives

Construction, operation, and maintenance of any action alternative would potentially result in direct and indirect impacts on general aquatic habitats (excluding designated critical habitats) and indirect impacts on fish and aquatic species. The level of these impacts is non-quantifiable largely due to the insufficiency of reliable data and will be presented in the following sections as a qualitative assessment.

Potential Project related impacts on USFS-MIS, and USFS-sensitive species occurring on the Ashley, Manti-La Sal, and Uinta National Forests in Utah were analyzed separately. Results of that analysis are included in the USFS Fish and Aquatic Resources Specialist Report (USFS 2013d).

3.2.9.5.3 345-kilovolt Ancillary Transmission Components

The 345kV ancillary transmission line components (Segments 4A, 4B, and 4C) are components of the Project necessary to step-down the 500kV line to the existing Clover 345kV system. Segments 4A and 4B are pre-existing, outdated 345kV lines and would need to be rebuilt to facilitate the step down process. Segments 4A and 4B would be constructed within the existing right-of-way. Additionally, the existing Mona to Huntington 345kV transmission line would be looped into the Clover Substation. This loop is referred to as Segment 4C and would be constructed outside of existing rights-of-way.

The 345kV segments in proximity of the Clover Substation would be constructed in uplands currently being used for agriculture and livestock grazing. Construction of these three segments would affect 9 intermittent lotic habitats which are tributaries of Currant Creek and the Burraston Ponds. Following proper implementation of selective mitigation measures, low or nonidentifiable impacts on these habitats would be expected. These lotic habitats do not provide suitable habitat for fish or other aquatic species being analyzed in this section.

3.2.9.5.4 500-kilovolt Transmission Line Components

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The four WYCO alternative routes traverse the southern reaches of Wyoming Basin and northern Colorado Plateau ecoregions crossing Sweetwater and Carbon counties in Wyoming, as well as Moffat and Routt counties in Colorado (MV-11a). Habitat for special status fish and amphibian, game fish, and other aquatic organisms include lentic, lotic and wetland habitats in the Great Divide Closed Basin, Little Snake, Lower White, Lower Yampa, Upper Yampa, Medicine Bow, Muddy, Pathfinder – Seminoe Reservoirs, and Upper North Platte Subbasins. The following sections describe fish and aquatic resources occurring along each alternative route and the potential impacts on those resources resulting from the Project. Table 3-134 summarizes miles of residual impacts on federally listed endangered fish as well as direct and indirect impacts on occurrences of special status aquatic species by state for each of the WYCO alternative routes.

TABLE 3-134
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Route	State	Special Status Species	Residual Impact (miles crossed)[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
Alternative WYCO-B and Route Variations				
WYCO-B (Applicant Preferred Alternative)	Wyoming	Bluehead sucker, northern leopard frog	None	4
	Colorado	Colorado pikeminnow	0.1	1
WYCO-B-1	Wyoming	Bluehead sucker, northern leopard frog	None	4
	Colorado	Colorado pikeminnow	0.1	1
WYCO-B-2 (Agency Preferred Alternative)	Wyoming	Bluehead sucker, northern leopard frog	None	4
	Colorado	Colorado pikeminnow	0.1	1
WYCO-B-3	Wyoming	Bluehead sucker, northern leopard frog	None	4
	Colorado	Colorado pikeminnow	0.1	1
Alternative WYCO-C and Route Variations				
WYCO-C	Wyoming	None	None	None
	Colorado	Colorado pikeminnow	0.1	1
WYCO-C-1	Wyoming	None	None	None
	Colorado	Colorado pikeminnow	0.1	1
WYCO-C-2	Wyoming	None	None	None
	Colorado	Colorado pikeminnow	0.1	1
WYCO-C-3	Wyoming	None	None	None
	Colorado	Colorado pikeminnow	0.1	1
Alternative WYCO-D and Route Variation				
WYCO-D	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	11
	Colorado	Colorado pikeminnow, humpback chub, northern leopard frog, roundtail chub	0.2	8
WYCO-D-1	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	11

TABLE 3-134 SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES				
Route	**State**	**Special Status Species**	**Residual Impact (miles crossed)[1]**	**Number of Occurrences Crossed by Alternative Route Study Corridor**
	Colorado	Colorado pikeminnow, humpback chub, northern leopard frog, roundtail chub	0.2	8
Alternative WYCO-F and Route Variations				
WYCO-F	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	7
	Colorado	Colorado pikeminnow	0.1	None
WYCO-F-1	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	7
	Colorado	Colorado pikeminnow	0.1	None
WYCO-F-2	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	7
	Colorado	Colorado pikeminnow	0.1	None
WYCO-F-3	Wyoming	Bluehead sucker, northern leopard frog, flannelmouth sucker, roundtail chub	None	7
	Colorado	Colorado pikeminnow	0.1	None
NOTE: [1]Residual impacts were only calculated where critical habitat for species listed under the Endangered Species Act is crossed by reference centerline.				

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Affected Environment (Wyoming)

Alternative WYCO-B in Wyoming crosses 6 subbasins in which 377 lotic habitats consisting of 2 perennial streams (Medicine Bow and North Platte rivers) and 373 intermittent streams; 16 lentic habitats, and 16 wetland habitats occur within 300 feet of the reference centerline.

Additionally, two occurrences of northern leopard frog and two occurrences of bluehead sucker occur within 1 mile of the WYCO-B reference centerline in Wyoming at Links W108 and W116 (Table 3-134 and MV-11a).

Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 share a common alignment with Alternative WYCO-B in Wyoming and would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Wyoming)

Alternative WYCO-B

No impacts on federally listed special status species or critical habitats would be anticipated to result from implementation of Alternative WYCO-B in Wyoming.

Impacts on habitats potentially occupied by BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the alternative route study

corridor. Impacts from surface disturbance related to Project construction could modify habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

No impacts on federally listed special status species or critical habitats would be anticipated to result from implementation of Alternative WYCO-B route variations in Wyoming. Impacts on habitats potentially occupied by BLM and/or State-listed special status species and other aquatic and/or semi-aquatic species would be expected to be the same as those described for Alternative WYCO-B.

Affected Environment (Colorado)

Alternative WYCO-B in Colorado crosses 3 subbasins in which 129 lotic habitats including 2 perennial (Yampa and Little Snake rivers) and 127 intermittent streams; 2 lentic habitats, and 3 wetland habitats occur within 300 feet of reference centerline. Alternative WYCO-B in Colorado does not cross any known habitat for state, BLM, or USFS listed special status species; however, it does cross the Yampa River at Link C91, which is designated critical habitat for Colorado pikeminnow (MV-11a).

Alternative WYCO-B route variations differ only slightly from WYCO-B in Colorado (Maps 2-2a and 2-2b). Rather than following Link C71, the route variations follow alternate alignments which are described below. Generally, all the WYCO-B routes in Colorado cross the Yampa and Little Snake rivers. The Yampa is designated critical habitat for Colorado pikeminnow and, thus, all routes would affect that designated habitat.

Route Variation WYCO-B-1 in Colorado follows Link C72 and crosses the Little Snake River north of where WYCO-F crosses the river. This route variation would affect 2 additional intermittent lotic habitats.

Route Variation WYCO-B-2 in Colorado follows Link C93 and avoids the Tuttle Ranch Conservation Easement, occurring north of Alternative WYCO-F for a distance of approximately 6 miles paralleling U.S. Highway 40 and crossing Deerlodge Road. This route variation would affect 8 additional intermittent lotic habitats and one additional lentic habitat.

Route Variation WYCO-B-3 in Colorado follows Link C172 and avoids crossing Deerlodge Road and would parallel existing transmission in closer proximity through the Tuttle Ranch Conservation Easement than Alternative WYCO-F for a distance of approximately 4.5 miles. This route variation would affect one less intermittent lotic habitat.

Environmental Consequences (Colorado)

Alternative WYCO-B

Potential impacts on Colorado pikeminnow critical habitat would result from ground-disturbing activities near the Yampa River. Following proper implementation of selective mitigation measures, impacts on Colorado pikeminnow critical habitat associated with Alternative WYCO-B in Colorado would include a 0.1 mile low residual impact and 66.3 miles of no identifiable impacts (Table 3-134).

Impacts from surface disturbance related to Alternative WYCO-B in Colorado could modify general aquatic and semi-aquatic habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-B Route Variations (WYCO-B-1, WYCO-B-2, and WYCO-B-3)

Potential impacts on Colorado pikeminnow critical habitat would result from ground-disturbing activities associated with development of the WYCO-B route variations in Colorado near the Yampa River. Following proper implementation of selective mitigation measures, impacts on Colorado pikeminnow critical habitat associated with Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 in Colorado would result in a 0.1 mile low residual impact (Table 3-134).

Impacts on general aquatic and semi-aquatic habitats would be expected to be the same as those described for Alternative WYCO-B in Colorado.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Affected Environment (Wyoming)

Alternative WYCO-C in Wyoming crosses 6 subbasins in which 296 lotic habitats consisting 2 perennial (Medicine Bow and North Platte rivers) and 294 intermittent streams; 9 lentic habitats, and 9 wetland habitats occur within 300 feet of reference centerline. Additionally, one known occurrence of northern leopard frogs is recorded within 1 mile of the reference centerline west of Hanna, Wyoming on Link W21 (Table 3-134 and MV-11a).

Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Wyoming share the same route alignment as Alternative WYCO-C in Wyoming and would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Wyoming)

Alternative WYCO-C

Alternative WYCO-C in Wyoming would result in no impacts on federally listed special status species or designated critical habitats.

Impacts on habitats potentially occupied by BLM and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Impacts from surface disturbance related to the Project could modify habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Alternative WYCO-C route variations in Wyoming share a common route and thus would be expected to result in the same impacts on fish and aquatic resources in Wyoming.

Affected Environment (Colorado)

Alternative WYCO-C in Colorado crosses 3 subbasins in which 129 lotic habitats consisting of 2 perennial (Little Snake and North Platte rivers) and 127 intermittent streams; 2 lentic habitats and 3 wetland habitats are within 300 feet of reference centerline. Alternative WYCO-C in Colorado does not encounter any known occurrences of state, BLM, or USFS-listed special status species but it does cross the Yampa River at Link C91 (MV-11a), which is designated critical habitat for Colorado pikeminnow.

Route Variations WYCO-C-1, WYCO-C-2, and WYCO-C-3 in Colorado share the same alignments as Route Variations WYCO-B-1, WYCO-B-2, and WYCO-B-3 respectively and would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Colorado)

Alternative WYCO-C

Impacts on Colorado pikeminnow critical habitat would result from ground-disturbing activities near the Yampa River. Following proper implementation of selective mitigation measures, impacts on Colorado pikeminnow critical habitat associated with Alternative WYCO-C in Colorado would include a 0.1 mile low residual impact (Table 3-134). Impacts from surface disturbance related to Alternative WYCO-C in Colorado could modify general aquatic and semi-aquatic habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-C Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Alternative WYCO-C route variations in Colorado differ only slightly from the Alternative WYCO-C route alignment. Route variations follow various alternate alignments that avoid Link C71.

Route Variation WYCO-C-1 follows Link C72 and crosses the Little Snake River north of where WYCO-C crosses the river. Link C72 would affect 2 additional intermittent lotic habitats.

Route Variation WYCO-C-2 follows Link C93 and avoids the Tuttle Ranch Conservation Easement, occurring north of Alternative WYCO-C for a distance of approximately 6 miles paralleling U.S. Highway 40 and crossing Deerlodge Road.

Route Variation WYCO-C-3 follows Link C172 and avoids crossing Deerlodge Road and would parallel existing transmission in closer proximity through the Tuttle Ranch Conservation Easement than Alternative WYCO-C for a distance of approximately 4.5 miles. Link C72 would affect 8 additional intermittent lotic habitats and one additional lentic habitat.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Affected Environment (Wyoming)

Alternative WYCO-D in Wyoming crosses 6 subbasins, in which 238 lotic habitats consisting of 7 perennial (Muddy Creek, Medicine Bow River, and North Platte River) and 231 intermittent or ephemeral lotic habitats; 20 lentic habitats, and 14 wetland habitats occur within 300 feet of reference centerline. Additionally, 11 occurrences of BLM and state-listed sensitive species including, flannelmouth sucker (Links W110, W111, W121, W299, and W300), bluehead sucker (Link W110), northern leopard frog (Link W110 and W22), and roundtail chub (Link W110 and W321) are recorded within 1 mile of reference centerline (MV-11a).

Route Variation WYCO-D-1 in Wyoming shares a common route and thus would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Wyoming)

Alternative WYCO-D

Alternative WYCO-D and Route Variation WYCO-D-1 in Wyoming would result in no impacts on federally listed special status species.

Impacts on habitats potentially occupied by BLM and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Impacts from surface disturbance related to the Project could modify habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-D Route Variation (WYCO-D-1)

Route Variation WYCO-D-1 in Wyoming shares a common route and thus would be expected to result in the same impacts on fish and aquatic resources.

Affected Environment (Colorado)

Alternative WYCO-D in Colorado crosses 4 subbasins, in which 236 lotic habitats consisting of 9 perennial (Elkhead, Little Cottonwood, South Fork Fortification, Fortification, and Little Bear creeks, Yampa and Little Snake rivers) and 227 intermittent or ephemeral streams; 19 lentic habitats, and 5 wetland habitats occur within 300 feet of the reference centerline. Alternative WYCO-D in Colorado crosses designated critical habitat for the Colorado pikeminnow at the Yampa River (Links C105 and C106) (MV-11a). Additionally, fish listed under the ESA as endangered, as well as BLM and Colorado-listed sensitive species occurrences are within 1 mile or reference centerline including humpback chub (Link 106), northern leopard frog location (Link C100), roundtail chub (Links C17 and C27) and Colorado pikeminnow (Links C101 and C106) (MV-11a).

Route Variation WYCO-D-1 diverges from Alternative WYCO-D in Colorado, following Link C173 (rather than Link C172) to colocate the route variation with existing transmission lines for approximately 4 miles. Given the proximity of the two alignments and the drainage pattern in the vicinity, Links C173 and C172 would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Colorado)

Alternative WYCO-D

Impacts on Colorado pikeminnow critical habitat would result from ground-disturbing activities near the Yampa River. Following proper implementation of selective mitigation measures, impacts on Colorado pikeminnow critical habitat associated with Alternative WYCO-D and Route Variation WYCO-D-1 would include a 0.2 mile low residual impact (Table 3-134).

Impacts on habitats potentially occupied by ESA, BLM and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Impacts from surface disturbance related to the Project could modify habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-D Route Variation (WYCO-D-1)

Route Variation WYCO-D-1 would result in similar impacts on fish and aquatic resources. Implementation of Link C173 instead of Link C172 would result in some variation between direct and indirect impacts on the same aquatic habitats where some habitats crossed by reference centerline along Link C173 would not be crossed by Link C172 but would occur within 300 feet of that reference centerline and vice versa.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Affected Environment (Wyoming)

Alternative WYCO-F in Wyoming crosses 6 subbasins, in which 286 lotic habitats consisting of 2 perennial (Medicine Bow and North Platte rivers) and 284 intermittent or ephemeral streams; 13 lentic habitats, and 12 wetland habitats occur within 300 feet of reference centerline.

Additionally, 7 occurrences of BLM and state-listed sensitive species are within 1-mile of reference centerline including bluehead sucker (Links W107 and W108), flannelmouth sucker (Links W120 and W124), northern leopard frog (Links W107 and W108), and roundtail chub (Link W124) (MV-11a).

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Route Variation WYCO-F-1 in Wyoming shares the same route alignment as Alternative WYCO-F in Wyoming and could affect the same fish and aquatic resources.

Environmental Consequences (Wyoming)

Alternative WYCO-F

Alternative WYCO-F in Wyoming would result in no impacts on federally listed special status species.

Impacts on habitats potentially occupied by BLM and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Impacts from surface disturbance related to the Project could modify habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 share the same route alignment in Wyoming and thus would result in the same potential impacts on fish and aquatic resources.

Affected Environment (Colorado)

Alternative WYCO-F

Alternative WYCO-F in Colorado crosses 3 subbasins, in which 129 lotic habitats consisting of 2 perennial (Little Snake and Yampa rivers) and 127 intermittent or ephemeral streams; 2 lentic habitats, and 3 wetland habitats occur within 300 feet of reference centerline. Additionally, the reference centerline crosses critical habitat for Colorado pikeminnow at the Yampa River near the mouth of Cedar Springs Draw, upstream of Cross Mountain Canyon (Link C91) (MV-11a). No occurrences of BLM or state-listed sensitive species are crossed by reference centerline.

Route Variations WYCO-F-1, WYCO-F-2, and WYCO-F-3 in Colorado differ only slightly from WYCO-F in Colorado and are sited to avoid the Tuttle Ranch Conservation Easement. These route variations would affect the same fish and aquatic resources as the WYCO-B route variations.

Route Variation WYCO-F-1 in Colorado follows Link C72 and crosses the Little Snake River north of where WYCO-F crosses the river. This route variation would affect 2 additional intermittent lotic habitats.

Route Variation WYCO-F-2 in Colorado follows Link C93 and avoids the Tuttle Ranch Conservation Easement, occurring north of Alternative WYCO-F for a distance of approximately 6 miles paralleling U.S. Highway 40 and crossing Deerlodge Road. This route variation would affect 8 additional intermittent lotic habitats and one additional lentic habitat.

Route Variation WYCO-F-3 in Colorado follows Link C172, avoids crossing Deerlodge Road, and would parallel existing transmission lines closer through the Tuttle Ranch Conservation Easement than Alternative WYCO-F for a distance of approximately 4.5 miles. This route variation would affect one less intermittent lotic habitat.

Environmental Consequences (Colorado)

Alternative WYCO-F

Impacts on Colorado pikeminnow critical habitat would result from ground-disturbing activities near the Yampa River. Following proper implementation of selective mitigation measures, Alternative WYCO-F in Colorado would result in a 0.1 mile moderate residual impact on Colorado pikeminnow critical habitat (Table 3-134). Impacts from surface disturbance related to Alternative WYCO-F in Colorado could modify general aquatic and semi-aquatic habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative WYCO-F Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Alternative WYCO-F route variations all cross the Yampa River. The route variations would all result in a 0.1 mile low residual impact on Colorado pikeminnow critical habitat. Similar to Alternative WYCO-F, route variations could modify general aquatic and semi-aquatic habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

The three COUT BAX routes occur from U.S. Highway 40 in Colorado to Clover, Utah by way of Baxter Pass. These routes occur south of the Uintah and Ouray Indian Reservation and pass through the town of Green River, Utah (MV-11b). These routes transverse the Colorado Plateau, Wasatch and Uinta mountains, and Central Basin and Range ecoregions. Habitat for special status fish, game fish, and other aquatic organisms include lentic, lotic and wetland habitats in the Colorado Headwaters-Plateau, Lower Green, Lower White, Price, San Pitch, San Rafael, Upper Colorado-Kane Springs, Utah Lake, and Westwater Canyon subbasins. The following sections describe fish and aquatic resources occurring along each route and the potential impacts on those resources resulting from the Project. Table 3-135 summarizes miles of residual impacts on federally listed endangered fish as well as direct and indirect impacts on occurrences of special status aquatic species by state for each of the COUT BAX routes.

TABLE 3-135
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
COUT BAX-B	Colorado	Colorado pikeminnow, roundtail chub, northern leopard frog	0.1	5
	Utah	Bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, razorback sucker, northern leopard frog, southern leatherside chub	0.1	16

TABLE 3-135
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
COUT BAX-C	Colorado	Colorado pikeminnow, roundtail chub, northern leopard frog	0.1	5
	Utah	Bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, razorback sucker, northern leopard frog, southern leatherside chub	0.1	16
COUT BAX-E	Colorado	Colorado pikeminnow, roundtail chub, northern leopard frog	0.1	5
	Utah	Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, razorback sucker, northern leopard frog	0.1	10

NOTE: [1]Residual impacts were only calculated where critical habitat for species listed under the Endangered Species Act is crossed by reference centerline.

Alternative COUT BAX-B

Affected Environment (Colorado)

Alternative COUT BAX-B in Colorado would cross 3 subbasins, in which 204 lotic habitats consisting of 4 perennial (White River, Douglas Creek, and Whiskey Creek) and 200 intermittent or ephemeral streams, 14 lentic habitats (Box Elder and Villard Flats Reservoirs), and 13 wetland habitats occur within 300 feet of reference centerline.

Alternative COUT BAX-B in Colorado crosses critical habitat for Colorado pikeminnow in the White River (Link C177) northeast of Rangely, Colorado (MV-11b).

Additionally, occurrences of northern leopard frog (Links C100 and C185), roundtail chub (Links C177 and C185), and Colorado pikeminnow (Link C177) are within 1 mile of Alternative COUT BAX-B reference centerline in Colorado (MV-11b).

Environmental Consequences (Colorado)

Alternative COUT BAX-B in Colorado would result in impacts on critical habitat for Colorado pikeminnow. Following proper implementation of selective mitigation measures, Alternative COUT BAX-B would result in a 0.1 mile low residual impact on designated critical habitat (Table 3-135).

Impacts on habitats potentially occupied by BLM and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Affected Environment (Utah)

Alternative COUT BAX-B in Utah would cross 6 subbasins, in which 343 lotic habitats consisting of 19 perennial streams (Thompson and Floy washes; Deer, Pleasant, Coal Fork, Indian, Hop, Salt, West, Currant, and Huntington creeks; Green and San Pitch rivers; and Water Hollow, and 1 spring), 324 intermittent or ephemeral streams; 11 lentic habitats, and one wetland habitat are within 300 feet of the reference centerline.

The reference centerline crosses critical habitat for Colorado pikeminnow and razorback sucker in the Green River (Link U487).

Additionally, species listed by the BLM, USFS, and Utah as sensitive species occurring within 1 mile of the reference centerline include occurrences of Colorado River cutthroat trout in Indian Creek (Link U630); northern leopard frog in the Green River (Link U487), frog in the ponds east of the San Pitch River, north of Mount Pleasant, Utah (Link U631); Columbia spotted frog in the San Pitch River and adjacent riparian areas, the ponds east of the San Pitch River, and near U.S. Highway 89 north of Mount Pleasant, Utah (Link U631); in Currant Creek, the West Creek wetland, and in the Burraston Ponds northwest of Nephi, Utah (Link U650); flannelmouth sucker in Huntington Creek upstream from Huntington, Utah (Link U731); and southern leatherside chub in the San Pitch River at Link U631 (MV-11b).

Species listed under the ESA as endangered occurring within 1 mile of the reference centerline include Colorado pikeminnow west of Crescent Junction and Colorado pikeminnow, razorback sucker, and bonytail where the route crosses the Green River, just south of Green River, Utah at Link U487 (MV-11b).

Environmental Consequences (Utah)

Alternative COUT BAX-B in Utah would result in impacts on Colorado pikeminnow and razorback sucker critical habitat in the Green River south of the town of Green River, Utah. Following proper implementation of selective mitigation measures, Alternative COUT BAX-B in Utah would result in a 0.1 mile low residual impact on designated critical habitats (Table 3-135).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-B would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-B would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-B would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT BAX-C

Affected Environment (Colorado)

Alternative COUT BAX-C in Colorado could affect the same fish and aquatic resources as Alternative COUT BAX-B in Colorado.

Environmental Consequences (Colorado)

Alternative COUT BAX-C in Colorado would result the same impacts on special status fish, special status amphibians, game fish, and other aquatic organisms as COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-C in Utah would affect the same fish and aquatic resources as Alternative COUT BAX-B in Utah.

Environmental Consequences (Utah)

Alternative COUT BAX-C in Utah would result the same impacts on special status fish, special status amphibians, game fish, and other aquatic organisms as COUT BAX-B in Utah.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-C would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-C would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-C would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT BAX-E

Affected Environment (Colorado)

Alternative COUT BAX-E in Colorado would affect the same fish and aquatic resources as Alternative COUT BAX-B in Colorado.

Environmental Consequences (Colorado)

Alternative COUT BAX-E in Colorado would result the same impacts on special status fish, special status amphibians, game fish, and other aquatic organisms as COUT BAX-B in Colorado.

Affected Environment (Utah)

Alternative COUT BAX-E in Utah crosses 7 subbasins, in which 349 lotic habitats consisting of 34 perennial (San Pitch, Green and Price rivers; Currant, Hop, Upper Huntington, Cottonwood, White Pine Fork, Mud, Gooseberry, and Miller creeks; Mud Water, Bob Wright, and Trail canyons; Floy, Water

Hollow, and Thompson washes) and 315 intermittent or ephemeral streams; 13 lentic habitats, and 6 wetland habitats are within 300 feet of reference centerline.

The reference centerline crosses critical habitat for Colorado pikeminnow and razorback sucker in the Green River (Link U487).

Additionally BLM, USFS, and Utah listed sensitive species within 1 mile of the reference centerline include occurrences of Bonneville cutthroat trout (Link U600), Colorado River cutthroat trout in tributaries of Gordon Creek including Mud Water and Bob Bishop canyons (Link U537); northern leopard frog in the Green River (Link U487) and in the ponds east of the San Pitch River, north of Mount Pleasant, Utah (Link U631); Columbia spotted frog in the San Pitch River and adjacent riparian areas and near U.S. Highway 89 north of Fairview, Utah (Link U636); in Currant Creek, the West Creek wetland complex, and in the Burraston Ponds northwest of Nephi, Utah (Link U650); and flannelmouth sucker in the Price River (Link U489) (MV-11b).

Species listed under the ESA as endangered occurring within 1 mile of the reference centerline include Colorado pikeminnow west of Crescent Junction and Colorado pikeminnow, razorback sucker, and bonytail where the route crosses the Green River, just south of Green River, Utah at Link U487 (MV-11b).

Environmental Consequences (Utah)

Alternative COUT BAX-E in Utah would affect designated critical habitat for Colorado pikeminnow and razorback sucker at Link U487 in the Green River, south of the town of Green River, UT (MV-11b). Following proper implementation of selective mitigation measures, impacts on federally listed critical habitat would include a 0.1 mile low residual impacts (Table 3-135).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT BAX-E would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT BAX-E would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT BAX-E would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

The five COUT alternative routes occur from U.S. Highway 40 in Colorado to Clover, Utah by way of the Uinta Basin and transverse the Colorado Plateaus, Wasatch and Uinta Mountains, and Central Basin and Range ecoregions (MV-11b). Habitat for special status fish, game fish, and other aquatic organisms

include lentic, lotic and wetland habitats in the Duchesne, Lower Green-Diamond, Lower White, San Pitch, San Rafael, Spanish Fork, Strawberry, Utah Lake, Lower Green-Desolation Canyon, Price, and Willow subbasins. The following sections describe fish and aquatic resources occurring along each route and the potential impacts on those resources resulting from the Project. Table 3-136 summarizes miles of residual impacts on federally listed endangered fish as well as direct and indirect impacts on occurrences of special status aquatic species by state for each of the COUT routes.

TABLE 3-136
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
Alternative COUT-A and Route Variation				
COUT-A	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	17
COUT-A-1	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	17
Alternative COUT-B and Route Variations				
COUT-B	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	20
COUT-B-1	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	21

TABLE 3-136
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
COUT-B-2	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	20
COUT-B-3	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	20
COUT-B-4	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	20
COUT-B-5	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, bonytail, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.1	20
Alternative COUT-C and Route Variations				
COUT-C	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	22

TABLE 3-136
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
COUT-C-1	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	23
COUT-C-2	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	22
COUT-C-3 (Agency Preferred Alternative)	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	22
COUT-C-4	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	22
COUT-C-5	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	22

TABLE 3-136
SPECIAL STATUS FISH AND AQUATIC SPECIES OCCURRING WITHIN THE ALTERNATIVE ROUTE STUDY CORRIDORS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Route	State	Special Status Species	Miles of Residual Impacts[1]	Number of Occurrences Crossed by Alternative Route Study Corridor
Alternatives COUT-H and COUT-I				
COUT-H (Applicant Preferred Alternative)	Colorado	None	None	None
	Utah	Bluehead sucker, Bonneville cutthroat trout, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub	0.2	16
COUT-I	Colorado	None	None	None
	Utah	Bluehead sucker, Colorado pikeminnow, Colorado River cutthroat trout, Columbia spotted frog, flannelmouth sucker, northern leopard frog, razorback sucker, roundtail chub, southern leatherside chub	0.2	20

NOTE: [1]Residual impacts were only calculated where critical habitat for species listed under the Endangered Species Act is crossed by reference centerline.

Alternative COUT-A and Route Variation (COUT-A-1)

Affected Environment (Colorado)

Alternative COUT-A in Colorado would cross only the Lower White subbasin, in which 58 intermittent or ephemeral lotic habitats, 1 lentic habitat (Box Elder Reservoir No. 2) and 2 wetland habitats occur within 300 feet of reference centerline. Neither critical habitat nor occurrences of special status fish or aquatic species are within 1 mile of this route.

Route Variation COUT-A-1 in Colorado would affect the same fish and aquatic resources as COUT-A in Colorado.

Environmental Consequences (Colorado)

Alternative COUT-A

Alternative COUT-A in Colorado would result in no impacts on federally listed endangered fish. Impacts from surface disturbance related could modify general aquatic and semi-aquatic habitats, resulting in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative COUT-A Route Variation (COUT-A-1)

Route Variation COUT-A-1 in Colorado would result in the same impacts on fish and aquatic resources as COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-A in Utah would cross 6 subbasins, in which 312 lotic habitats consisting of 37 perennial (Baser, Big Sand, and Red washes; Blind Canyon, Water Hollow; Currant, Dry Gulch, Hop, Lake Fork, Left Fork Spencer, Montes, Red, Salt, Sheep, Soldier, Thistle, Tie Fork, and West creeks; Duchesne, Green, Lake Fork, Strawberry, and Uinta rivers) and 275 intermittent or ephemeral streams; 34 lentic habitats, and 27 wetland habitats occur within 300 feet of the reference centerline.

The reference centerline crosses critical habitat in the Green River for razorback sucker and Colorado pikeminnow in the Green River at Link U390.

Species listed under the ESA as endangered and species listed by the BLM, USFS, and state of Utah as sensitive occur within 1 mile of reference centerline. Colorado pikeminnow, razorback sucker, bluehead sucker, bonytail, razorback sucker, roundtail chub, and flannelmouth sucker occur in the Horseshoe Bend and Stirrup areas of the Green River (Link 390); Bonneville cutthroat trout occur in Lake Fork Creek (a tributary to Soldier Creek) (Link U460); Columbia spotted frog occur in Currant Creek north of Nephi, Utah (Link U650); flannelmouth sucker in the Duchesne River (Link U420); Colorado River cutthroat trout in Willow Creek (tributary of Strawberry River) (Link U424); Bonneville cutthroat trout in Soldier Creek (Link U460) and Nebo Creek (Link U625); southern leatherside chub in Thistle Creek (tributary to San Pitch River) (Link U631); and Columbia spotted frog in the wetlands supported by Currant Creek as well as in the Burraston Ponds north of Nephi, Utah (Links U630 and U650) (MV-11b).

Route Variation COUT-A-1 in Utah would affect the same fish and aquatic resources as COUT-A in Utah.

Environmental Consequences (Utah)

Alternative COUT-A

Alternative COUT-A in Utah would result in impacts on Colorado pikeminnow and razorback sucker critical habitat at Links U390 and U487 in the Green River (MV-11b). Following proper implementation of selective mitigation measures, Alternative COUT-A in Utah would result in a 0.1 mile low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative COUT-A Route Variation (COUT-A-1)

Route Variation COUT-A-1 in Utah would result in impacts on Colorado pikeminnow and razorback sucker critical habitat at Links U390 and U487 in the Green River (MV-11b). Following proper implementation of selective mitigation measures, Route Variation COUT-A-1 in Utah would result in a 0.1 mile low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or State-listed special status species and other aquatic and/or semi-aquatic species would be expected to be the same as those described for Alternative COUT-A-1 in Utah.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-A and Route Variation COUT-A-1 would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-A and Route Variation COUT-A-1 would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Affected Environment (Colorado)

Alternative COUT-B in Colorado would affect the same fish and aquatic resources as COUT-A in Colorado.

Alternative COUT-B route variations in Colorado follow a common route and would be expected to affect the same fish and aquatic resources.

Environmental Consequences (Colorado)

Alternative COUT-B

Alternative COUT-B in Colorado follows a common route with Alternative COUT-A in Colorado. Both alternative routes would affect the same fish and aquatic resources.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Alternative COUT-B and variations in Colorado follow a common route and would be expected to impact the same fish and aquatic resources.

Affected Environment (Utah)

Alternative COUT-B in Utah would cross 7 subbasins, in which 382 lotic habitats consisting of 62 perennial (Montes, Dry Gulch, Hop, Kyune, Sowers, Argyle, Horse, Willow, Beaver, Indian, Soldier, Sheep, Tie Fork, Thistle, Left Fork Spencer, and Currant creeks; Price, Lake Fork, Duchesne, and Uinta rivers; Jack and Blind canyons; Baser, Big Sand, Cottonwood, and Red washes; and Lateral No. 5) and 320 intermittent streams; 24 lentic habitats, and 28 wetland habitats, 2 of which are forested wetlands associated with the Green River occur within 300 feet of reference centerline.

The reference centerline crosses critical habitat for Colorado pikeminnow and razorback sucker at the Stirrup area of the Green River (Link U390).

Fish and aquatic species listed under the ESA as endangered and by the BLM, USFS, and state of Utah as sensitive potentially occur within 1 mile of COUT-B reference centerline in Utah and include: bluehead sucker, flannelmouth sucker, Colorado pikeminnow, razorback sucker, bonytail, and roundtail chub in the

Green River near the Stirrup and Horseshoe Bend areas (Link U390); Colorado River cutthroat trout in Tabbyune Creek (Link U530); northern leopard frog in the Big Sand Wash area (Link U430); bluehead sucker, roundtail chub, and northern leopard frog in the White River near it's confluence with the Green River (Link 530); Bonneville cutthroat trout in Clear Creek (Link U530), Soldier Creek (Link U460 and U539), Nebo Creek (Link U625), Tie Fork Creek (Link U539), Sheep Creek (Link U539), and Lake Fork Creek (Link U460); southern leatherside chub in Thistle Creek (Link U625), and Columbia spotted frogs in the wetlands supported by Currant Creek and the Burraston Ponds north of Nephi, Utah (MV-11b).

Alternative COUT-B route variations are sited to avoid Links U434, U524, and U527. Avoiding these alignments was necessary to reduce impacts on sage grouse. Those fish and aquatic species listed under the ESA as endangered and by the BLM, USFS, and state of Utah as sensitive occurring within 1 mile of COUT-B reference centerline in Utah could all be similarly affected by COUT-B route variations. Aquatic habitats affected by the route variations differ slightly from the original route and are discussed below.

Route Variation COUT-B-1 in Utah follows Links U409, U511, U513, U515, and U560 which would affect 349 lotic habitats consisting of 54 perennial (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Lake Fork, Left Fork Spencer, Montes, Salt, Sheep, Soldier, Sowers, Tabbyune, Thistle, Tie Fork, and West creeks; Baser, Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow) and 295 intermittent streams; 28 lentic habitats, and 27 wetland habitats. The alternate alignments could affect 8 fewer perennial and 25 fewer intermittent lotic habitats; 4 more lentic habitats, and 1 fewer wetland habitat than COUT-B in Utah.

Route Variation COUT-B-2 in Utah follows Links U511, U514, U515, U520, U540, and U560 which would affect 365 lotic habitats consisting of 63 perennial (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Slat, Sheep, Soldier, Sowers, Tabbyune, Thistle, West Fork Willow, and Willow creeks; Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow) and 302 intermittent or ephemeral streams; 30 lentic habitats, and 28 wetland habitats. The alternate alignments could affect 1 additional perennial stream and 18 fewer intermittent or ephemeral streams; 6 additional lentic habitats, and the same wetlands as Alternative COUT-B in Utah.

Route Variation COUT-B-3 in Utah follows Links U512, U514, U516, and U560 which would affect 353 lotic habitats consisting of 62 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Slat, Sheep, Soldier, Sowers, Tabbyune, Thistle, West Fork Willow, and Willow creeks; Big Sand and Red washes; Duchesne, Green, Lake Fork, Uinta, and White rivers; Blind Canyon, Lateral No. 5, and Water Hollow) and 291 intermittent or ephemeral streams; 26 lentic habitats, and 26 wetland habitats. The alternate alignments could affect the same perennial streams, 29 fewer intermittent or ephemeral streams, 2 more lentic habitats, and the same wetland habitats as COUT-B in Utah.

Route Variation COUT-B-4 in Utah follows Links U512, U514, U515, U540, and U560 which would affect 357 lotic habitats consisting of 60 perennial streams (Argyle, Bear, Currant, Dry Gulch, Hop, Indian, Left Fork Spencer, Montes, Salt, Sheep, Soldier, Sowers, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Duchesne, Green, Lake Fork, Uinta, and White rivers; Big Sand and Red washes; Blind Canyon, Lateral No. 5, and Water Hollow) and 297 intermittent or ephemeral streams; 29 lentic habitats, and 27 wetland habitats. The alternate alignments could affect 2 fewer perennial streams, 23 fewer intermittent or ephemeral streams, 5 more lentic habitats, and 1 fewer wetland habitat than COUT-B in Utah.

Route Variation COUT-B-5 in Utah follows Links U511, U514, U516, U520, and U560 which would affect 361 lotic habitats consisting of 65 perennial streams (Argyle, Currant, Dry Gulch, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Montes, Right Fork Kyune, Salt, Sheep, Soldier, Sowers,

Tabbyune, Thistle, West, West Fork Willow, and Willow creeks; Duchesne, Green, Lake Fork, Uinta, and White rivers; Big Sand and Red washes; Blind Canyon, and Water Hollow) and 296 intermittent or ephemeral streams; 27 lentic habitats, and 27 wetland habitats. The alternate alignments could affect 3 more perennial streams, 24 fewer intermittent or ephemeral streams, 3 more lentic habitats, and 1 fewer wetland habitat than COUT-B in Utah.

Environmental Consequences (Utah)

Alternative COUT-B

Alternative COUT-B in Utah would result in impacts on critical habitats for Colorado pikeminnow and razorback chub in the Green River. Following proper implementation of selective mitigation measures, Alternative COUT-B would result in 0.1 mile of low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the Alternative COUT-B as well as all route variations where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative COUT-B Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Route Variation COUT-B-1 in Utah would result in impacts on critical habitats for Colorado pikeminnow and razorback sucker in the Green River. Following proper implementation of selective mitigation measures, Route Variation COUT-B-1 in Utah would result in 0.1 mile low residual impact (Table 3-136).

Route Variations COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5 in Utah affects critical habitats for Colorado pikeminnow and razorback sucker in the Green River. Following proper implementation of selective mitigation measures, these route variations would result in 0.1 mile of low residual impact (Table 3-136).

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-B and route variations would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-B and route variations would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-B and route variations would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the Project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Affected Environment (Colorado)

Alternative COUT-C in Colorado could affect the same fish and aquatic resources as COUT-A in Colorado.

The Alternative COUT-C route variations all share a common route through Colorado and would be expected to affect the same fish and aquatic resources as described under COUT-A in Colorado.

Environmental Consequences (Colorado)

Alternative COUT-C

Alternative COUT-C in Colorado would result in the same impacts on fish and aquatic resources as COUT-A in Colorado.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

The Alternative COUT-C route variations all share a common route through Colorado and would be expected to result in the same residual impacts on fish and aquatic resources as those described under COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-C in Utah would cross 6 subbasins, in which 326 lotic habitats consisting of 36 perennial streams (Argyle, Beaver, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Minnie Maud, Salt, Sheep, Soldier, Summit, Thistle, Tie Fork, West, and Willow creeks; Blind and Jack canyons; Price and White rivers; and Water Hollow) and 290 intermittent or ephemeral streams; 12 lentic habitats, and 9 wetland habitats occur within 300 feet of reference centerline.

Critical habitat for Colorado pikeminnow are crossed by the reference centerline at the White River (Link U300) and critical habitat for Colorado pikeminnow and razorback sucker are crossed by the reference centerline at the Green River (Link U400).

Species listed under the ESA as endangered, as well as those species listed by the BLM, USFS, and state of Utah as sensitive occur within 1 mile of the reference centerline and include: Bonneville cutthroat trout in Tie Fork (Link U539), Sheep (Link U539), and Lake Fork (Link U460) Tabbyune (Link U530), Right Fork of Clear (Link U530), Soldier (Links U530 and U460), and Nebo creeks (Link U625); bluehead sucker in the Green River (Link U400) and White River near it's confluence with the Green River (Link U530); Colorado pikeminnow in the White (Link U300) and Green rivers (Link U400); Columbia spotted frog in the wetlands supported by Currant Creek as well as in the Burraston Ponds north of Nephi, Utah (Links U630 and U650); flannelmouth sucker in the Green River (Link U400); northern leopard frog in the White River (Link U300 and U530), Green River (Link U400), and Willow Creek (Link U300); razorback sucker in the Green River (Link U400); roundtail chub in the White River (Links U300 and U530); and southern leatherside chub in Thistle Creek (Link U625) (MV-11b).

Alternative COUT-C route variations are sited to avoid Links U408, U406, U524, and U527. Avoiding these alignments was necessary to reduce impacts on sage-grouse. Additionally, fish and aquatic species listed under the ESA as endangered and by the BLM, USFS, and state of Utah as sensitive and aquatic habitats occurring within 1 mile of COUT-C reference centerline in Utah are affected by the route variations similar to the original route, differing only slightly as discussed below.

Alternative COUT-C route variations could all affect Bonneville cutthroat trout, Colorado pikeminnow, Columbia spotted frog, flannelmouth sucker, razorback sucker, and southern leatherside chub in the same locations as COUT-C in Utah.

Additionally, Alternative COUT-C route variations avoid Link U527 and the occurrences of bluehead sucker, Colorado River cutthroat trout, northern leopard frog, and roundtail chub which occur within 1 mile of that alignment.

Route Variation COUT-C-1 follows Links U409, U511, U513, U515, and U560 which would affect 296 lotic habitats consisting of 28 perennial (Argyle, Bear, Currant, Hop, Indian, Lake Fork, Left Fork Spencer, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow) and 268 intermittent or ephemeral streams; 14 lentic habitats, and 7 wetland habitats. The alternate alignments could affect 8 fewer perennial streams, 22 fewer intermittent or ephemeral streams, 2 more lentic habitats, and 2 fewer wetland habitats than Alternative COUT-C in Utah.

Special status aquatic species affected by Route Variation COUT-C-1 which differ from those described under COUT-C and those common to all route variations as discussed above include: 3 additional occurrences of Colorado River cutthroat trout including 1 at Links U513, U515 and U560, as well as 1 additional occurrence of roundtail chub at Link U515.

Route Variation COUT-C-2 follows Links U409, U513, U515, U520, U540, and U560 which would affect 312 lotic habitats consisting of 37 perennial (Argyle, Bear, Currant, Hop, Indian, Lake Fork, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow) and 275 intermittent or ephemeral streams; 16 lentic habitats and 8 wetland habitats. The alternate alignments could affect 1 more perennial stream, 15 more intermittent or ephemeral streams, 4 more lentic habitats, and 1 fewer wetland habitat than Alternative COUT-C in Utah.

Special status aquatic species affected by Route Variation COUT-C-2 which differ from those described under COUT-C and those common to all route variations as discussed above include: 1 additional occurrence of Colorado River cutthroat trout at Link U515 and 1 at Link U560, as well as 1 additional occurrence of roundtail chub at Link U515.

Route Variation COUT-C-3 follows Links U409, U514, U515, U520, and U560 which would affect 308 lotic habitats consisting of 39 perennial (Argyle, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Right Fork Kyune, Salt Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow) and 269 intermittent or ephemeral streams; 13 lentic habitats, and 7 wetland habitats. The alternate alignments could affect 3 more perennial streams, 21 fewer intermittent or ephemeral streams, 1 more lentic habitat, and 2 fewer wetland habitats than COUT-C in Utah.

Special status aquatic species affected by Route Variation COUT-C-3 which differ from those described under COUT-C and those common to all route variations as discussed above include 1 additional occurrence of Colorado River cutthroat trout at Link U516 and 1 at Link U560, as well as 1 additional occurrence of roundtail chub at Link U516.

Route Variation COUT-C-4 follows Links U411, U512, U514, U516, and U560 which would affect 315 lotic habitats consisting of 36 perennial (Argyle, Bear, Currant, Hop, Indian, Lake fork, Left Fork Spencer, Minnie Maud, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork West, West Fork Willow and Willow creeks; Green and White rivers; Blind Canyon, and Water Hollow) and 279 intermittent or ephemeral streams; 15 lentic habitats, and 7 wetland habitats. The alternate alignments could affect the

same number of perennial streams, 11 fewer intermittent or ephemeral streams, 3 more lentic habitats, and 2 fewer wetland habitats that COUT-C in Utah.

Special status aquatic species affected by Route Variation COUT-C-4 which differ from those described under COUT-C and those common to all route variations as discussed above include: 1 additional occurrence of Colorado River cutthroat trout at Link U515 and 1 at Link U560, as well as 1 additional occurrence of roundtail chub at Link U516.

Route Variation COUT-C-5 follows Links U411, U512, U514, U516, and U560 which would affect 311 lotic habitats consisting of 38 perennial (Argyle, Currant, Hop, Horse, Indian, Kyune, Lake Fork, Left Fork Spencer, Minnie Maud, Right Fork Kyune, Salt, Sheep, Soldier, Tabbyune, Thistle, Tie Fork, West, West Fork Willow, and Willow creeks; Green and White rivers; Blind Canyon and Water Hollow) and 273 intermittent or ephemeral streams; 12 lentic habitats, and 6 wetland habitats. The alternate alignments could affect 2 more perennial streams, 17 fewer intermittent or ephemeral streams, the same number of lentic habitats, and 3 fewer wetland habitats than COUT-C in Utah.

Special status aquatic species affected by Route Variation COUT-C-5 which differ from those described under COUT-C and those common to all route variations as discussed above include: 1 additional occurrence of Colorado River cutthroat trout at Link U516 and 1 at Link U560, as well as 1 additional occurrence of roundtail chub at Link U516.

Environmental Consequences (Utah)

Alternative COUT-C

Alternative COUT-C in Utah would result in 2 impacts on Colorado pikeminnow and 1 impact on razorback sucker critical habitats. Following proper implementation of selective mitigation measures, Alternative COUT-C would result in a 0.2 mile low residual impact a (Table 3-136).

Impacts on habitats potentially occupied by BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Alternative COUT-C Route Variations (COUT-C-1, COUT-C-2, COUT-C-3, COUT-C-4, and COUT-C-5)

Alternative COUT-C route variations would all result in the same 2 impacts on Colorado pikeminnow and 1 impact on razorback sucker critical habitats as Alternative COUT-C in Utah. Following proper implementation of selective mitigation measures, route variations would each individually result in a 0.2 mile low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species would be expected to be the same as those described for Alternative COUT-C in Utah.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-C and route variations would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in

applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-C and route variations would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-C and route variations would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the Project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-H (Applicant Preferred Alternative)

Affected Environment and Environmental Consequences (Colorado)

Alternative COUT-H in Colorado would have the same affected environment and environmental consequences as COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-H in Utah would cross 7 subbasins, in which 303 lotic habitats consisting of 39 perennial streams (Argyle, Cottonwood, Currant, Gooseberry, Hop, Minnie Maud, Mud, North Fork Gordon, Salt, Summit, Upper Huntington, West, White Pine Fork, and Willow creeks; Boarding House, Deep, Mathis, and Trail canyons; Green, Price, and San Pitch rivers) and 264 intermittent or ephemeral streams; 14 lentic habitats, and 9 wetland habitats are within 1 mile of the reference centerline.

Critical habitat for Colorado pikeminnow is crossed by the reference centerline at the White River (Link U300) and critical habitat for Colorado pikeminnow and razorback sucker are crossed by the reference centerline at the Green River (Link U400).

Species listed under the ESA as endangered and those species listed by the BLM, USFS, and state of Utah as sensitive have occurrences within 1 mile of the reference centerline in the following locations: bluehead sucker in the Green River (Link U400) and Willow Creek (Link U435 and U545); Bonneville cutthroat trout in the West Fork of Gooseberry Creek (Link U600) and Fairview Canyon at White Pine Fork (Link U600); Colorado pikeminnow in the White (Link U300) and Green rivers (Link U400); Columbia spotted frog in Currant Creek north of Nephi, Utah (Link U650), in the wetlands supported by Currant Creek, as well as in the Burraston Ponds north of Nephi, Utah (Links U636 and U650); flannelmouth sucker in the Green River (Link U400); northern leopard frog in the White River (Link U300), Green River (Link U400), and the Price River (Link U546); razorback sucker in the Green River (Link U400); and roundtail chub in the White River (Link U300) (MV-11b).

Environmental Consequences (Utah)

Alternative COUT-H in Utah would result in impacts on Colorado pikeminnow and razorback sucker critical habitats. Following proper implementation of selective mitigation measures Alternative COUT-H would result in a 0.2 mile low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-H would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-H would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-H would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

Alternative COUT-I

Affected Environment and Environmental Consequences (Colorado)

Alternative COUT-I in Colorado would have the same affected environment and environmental consequences as COUT-A in Colorado.

Affected Environment (Utah)

Alternative COUT-I in Utah would cross 7 subbasins in which 420 lotic habitats consisting of 34 perennial streams (Argyle, Cedar, Coal, Coal Fork, Currant, Deer, Hop, Huntington, Indian, Miller, Minnie Maud, Pleasant, Salt, Soldier, Summit, West, and Willow creeks; Green, Price, San Pitch, and White rivers; Marsing Wash, and Water Hollow) and 386 intermittent or ephemeral habitats; 15 lentic habitat, and 9 wetlands are within 300 feet of the reference centerline.

Critical habitat for Colorado pikeminnow and razorback sucker is crossed by reference centerline at the White River (Link U300) and Green River (Link U400).

Species listed under the ESA as endangered and those species listed by the BLM, USFS, and state of Utah as sensitive have occurrences within 1 mile of the reference centerline in the following locations: bluehead sucker in the Green River (Link U400), Huntington Creek (U438); Colorado pikeminnow in the White River (Link U300), Green River (Link U400); Colorado River cutthroat trout in Indian Creek (Link U630); Columbia spotted frog in the San Pitch River (Link U631), in Currant Creek north of Nephi, Utah (Link U650), in the ponds east of the San Pitch River, north of Mount Pleasant, Utah (Link U631), the riparian zone associated with the San Pitch River and near U.S. Highway 89, north of Mount Pleasant, Utah (Link U631), the Currant Creek and West Creek wetland complexes and in the Burraston Ponds northwest of Nephi, Utah (Link U650); flannelmouth sucker in the Green River (Link U400); northern leopard frog in the White River (Link U300), Little North Creek (Link U631), Green River (Link U400), in the ponds east of the San Pitch River, north of Mount Pleasant, Utah (Link U631); razorback sucker in the Green River (Link U400); and roundtail chub in the White River (Link U300).

Environmental Consequences (Utah)

Alternative COUT-I in Utah would result in impacts on Colorado pikeminnow and razorback sucker critical habitats and occurrences. Following proper implementation of selective mitigation measures, Alternative COUT-I would result in a 0.2 mile low residual impact (Table 3-136).

Impacts on habitats potentially occupied by ESA-listed endangered species, as well as BLM, USFS, and/or state-listed special status species and other aquatic and/or semi-aquatic species could result from

construction, operation, and maintenance of the alternative route where occurrences or habitats are documented within the route study corridor. Modification of habitats would result in a short-term reduction of habitat quality and quantity and could potentially result in mortality of individuals.

Results of U.S. Forest Service Specialist Reports

USFS evaluated whether implementation of Alternative COUT-I would be in conformance with USFS policies pertaining to management of USFS sensitive and MIS species and standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. The results of this evaluation were documented in the Fish and Aquatic Specialist Report and are available for review and download from the Project website. The evaluation determined that implementation of Alternative COUT-I would be in conformance with standards, guidelines, and management objectives pertaining to fish and aquatic resources contained in applicable USFS LRMPs. For USFS sensitive species, the analysis found that Alternative COUT-I would either have no effect or may affect individuals but would not cause a trend towards federal listing or loss of viability for all USFS sensitive species in the Project area. For MIS species, the analysis found that the project would not affect the existing forest-wide population trends for all MIS species in the Project area.

3.2.9.5.5 Series Compensation Stations for the 500-kilovolt Transmission Line

Alternative WYCO-B (Applicant Preferred Alternative) and Route Variations (WYCO-B-1, WYCO-B-2 [Agency Preferred Alternative], and WYCO-B-3)

Siting Area A – Powder Wash

Affected Environment

Siting Area A is located on the Wyoming/Colorado state line in the Little Snake Subbasin (HUC 14050003) where the landscape is dominated by sagebrush, grassland, and pinyon-juniper habitats. The series compensation station siting area is generally located on the south slope of the Powder Rim where water from the Cherokee Creek and Powder Wash drainage basins convey water south into the Little Snake River. The Powder Wash series compensation station siting area contains perennial and intermittent lentic and lotic habitats, and semi aquatic and aquatic habitats such as riparian areas and wetlands. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic resources from the 33,688-acre Powder Wash series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B and route variations (Table 3-134). Ground-disturbing activities resulting from construction, operation, and maintenance of the Powder Wash series compensation station could result in alteration of aquatic (lentic and lotic) and/or semi aquatic habitats (wetland and riparian areas), destabilization and/or compaction of soils, and subsequent erosion and discharge of sediment into nearby lentic and lotic habitats. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.9.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Siting Area B – Nine Mile Basin

Affected Environment

Siting Area B is located in Colorado in the Little Snake Subbasin (HUC 14050003) where the landscape is dominated by sagebrush, grassland, and pinyon-juniper habitats. The series compensation station siting area is generally located within the Nine Mile Basin where the Shafer's Draw, Nipple Gulch, and South Nipple Gulch watersheds convey water to the Little Snake River. The Nine Mile Basin series compensation station siting area contains perennial and intermittent lentic and lotic habitats and is situated along approximately 14 miles of the Little Snake River. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic resources from the 36,264 acre Nine Mile Basin series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B and route variations (Table 3-134). Ground-disturbing activities resulting from construction, operation, and maintenance of the Nine Mile Basin series compensation station could result in alteration of aquatic (lentic and lotic) and/or semi aquatic habitats (wetland and riparian areas), destabilization and/or compaction of soils, and subsequent erosion and discharge of sediment into nearby lentic and lotic habitats. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.9.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Siting Area C – Maybell

Affected Environment

Siting Area C is located in Colorado in the Little Snake (HUC 14050003) and Lower Yampa (14050002) subbasins where the landscape is dominated by sagebrush, grassland, pinyon-juniper habitats, and agricultural land. The series compensation station siting area is generally located within watersheds which convey water to the Yampa River. The Maybell series compensation station siting area contains perennial and intermittent aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area. Additionally, the siting area is situated along approximately six miles of the Yampa River where the river is listed as critical habitat for Colorado pikeminnow.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic from the 37,859 acre Maybell series compensation station siting area is included in the disturbance analysis for Alternative WYCO-B and route variations (Table 3-134). Ground-disturbing activities resulting from construction, operation, and maintenance of the Maybell series compensation station could result in alteration of aquatic (lentic and lotic), and/or semi aquatic habitats (wetland and riparian areas), destabilization and/or compaction of

soils, and subsequent erosion and discharge of sediment into nearby lentic and lotic habitats. Additionally, water withdrawal for construction and maintenance of the series compensation station could indirectly affect critical habitat for Colorado pikeminnow. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.9.4.2. A detailed discussion of potential indirect effects of water withdrawal is included in the Project Biological Assessment.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative WYCO-C and Route Variations (WYCO-C-1, WYCO-C-2, and WYCO-C-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-C and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternative WYCO-D and Route Variation (WYCO-D-1)

Siting Area D – Bell Rock

Affected Environment

Siting Area D is located in Colorado in the Lower Yampa (14050002) subbasin where the landscape is dominated by sagebrush, grassland, and agricultural land. The siting area is generally located within watersheds which convey water to the Yampa River. The Bell Rock series compensation station siting area contains perennial and intermittent aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area. The series compensation station siting area is situated along approximately 1.5 miles of the Yampa River where the river is designated critical habitat for Colorado pikeminnow.

Environmental Consequences

The estimated area of disturbance (in acres) on water resources from the 26,976 acre Bell Rock series compensation station siting area is included in the disturbance analysis for Alternative WYCO-D, and

Route Variation WYCO-D-1 (Table 3-134). Ground-disturbing activities resulting from construction, operation, and maintenance of the Bell Rock series compensation station could result in removal or alteration of wetland and riparian vegetation, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. Additionally, water withdrawal for construction and maintenance of the series compensation station could indirectly affect critical habitat for Colorado pikeminnow. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.2.4.2. A detailed discussion of potential indirect effects of water withdrawal is included in the Project Biological Assessment.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative WYCO-F and Route Variations (WYCO-F-1, WYCO-F-2, and WYCO-F-3)

Siting Area A – Powder Wash

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area A as Alternative WYCO-B and route variations.

Siting Area B – Nine Mile Basin

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area B as Alternative WYCO-B and route variations.

Siting Area C – Maybell

Affected Environment and Environmental Consequences

Alternative WYCO-F and route variations have the same affected environment and environmental consequences for Siting Area C as Alternative WYCO-B and route variations.

Alternatives COUT BAX-B, COUT BAX-C, COUT BAX-E

Siting Area G – Green River

Affected Environment

Siting Area G is located in Utah in the Lower Green (HUC 14060008) subbasin just west of the town of Green River. The local landscape is dominated by sagebrush and salt desert. The drainage basins within the series compensation station siting area generally convey water east into the Green River. The Green River series compensation station siting area contains intermittent aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats. Saleratus Wash supports a large contiguous riparian area which supports wetlands. Cottonwood and Fivemile washes also would be affected but these drainages appear to receive very little precipitation and thus have little riparian vegetation associated with them and provide little available habitat for fish or amphibians. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area.

Additionally, the siting area is located upstream from the Green River where those waters are designated as critical habitat for Colorado pikeminnow and razorback sucker.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic resources from the 21,135 acre Green River series compensation station siting area is included in the disturbance analysis for Alternative COUT BAX-B (Table 3-135). Ground-disturbing activities resulting from construction, operation, and maintenance of the Green River series compensation station could result in removal or alteration of aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby lentic and lotic systems. Additionally, water withdrawal for construction and maintenance of the series compensation station could indirectly affect critical habitat for Colorado pikeminnow and razorback sucker. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.2.4.2. A detailed discussion of potential indirect effects of water withdrawal is included in the Project Biological Assessment.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative COUT-A and Route Variation (COUT-A-1)

Siting Area F – Roosevelt

Affected Environment

Siting Area F is located in Utah in the Duchesne subbasin (HUC 14060003) just south of the town of Roosevelt. The local landscape is predominately agriculture and residential areas and where not developed is dominated by sagebrush and grassland habitats. The Roosevelt series compensation station siting area contains a large number of perennial and intermittent lentic and lotic habitats including Dry Gulch, Cottonwood, and Montes creeks, Lateral C Canal, the Uinta River, Bottle Hollow Reservoir, associated riparian areas, and many areas supporting wetlands. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area but due to the presence of suitable habitat, various fish and other aquatic and/or semi aquatic species likely occur in the area. Additionally, the siting area is located upstream from the Duchesne River where those waters are designated as critical habitat for razorback sucker.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic resources from the 36,624 acre Roosevelt series compensation station siting area is included in the disturbance analysis for Alternative COUT-A and Route Variation COUT-A-1 (Table 3-136). Ground-disturbing activities resulting from construction, operation, and maintenance of the Roosevelt series compensation station could result in removal or alteration of aquatic (lentic and lotic) and semi-aquatic (wetland and riparian) habitats, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby aquatic and semi-aquatic systems. Additionally, water withdrawal for construction and maintenance of the series compensation station could indirectly affect designated critical habitat for razorback sucker. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.2.4.2. A detailed discussion of potential indirect effects of water withdrawal is included in the Project Biological Assessment.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternative COUT-B and Route Variations (COUT-B-1, COUT-B-2, COUT-B-3, COUT-B-4, and COUT-B-5)

Siting Area F – Roosevelt

Affected Environment and Environmental Consequences

Alternative COUT-B and route variations have the same affected environment and environmental consequences for Siting Area F as Alternative COUT-A and route variation.

Alternative COUT-C and Route Variations (COUT-C-1, COUT-C-2, COUT-C-3 [Agency Preferred Alternative], COUT-C-4, and COUT-C-5)

Siting Area E – Bonanza

Affected Environment

Siting Area E is located in Utah in the Lower White subbasin (HUC 14050007). The local landscape is sparsely vegetated and semi-arid where vegetation such as sagebrush and salt desert shrubs are dominant. The Bonanza series compensation station siting area contains only a few intermittent lentic and lotic habitats and the main drainage basin is Coyote Wash. The drainage basins within the siting area generally convey water east or west into the White River. No occurrences were inventoried in the 2-mile-wide alternative route study corridor within the series compensation station siting area.

Environmental Consequences

The estimated area of disturbance (in acres) on fish and aquatic resources from the 31,802 acre Bonanza series compensation station siting area is included in the disturbance analysis for Alternative COUT-C and route variations (Table 3-136). Ground-disturbing activities resulting from construction, operation, and maintenance of the Bonanza series compensation station could result in removal or alteration of intermittent aquatic habitats, destabilization and/or compaction of soils and subsequent erosion which could discharge sediment into nearby aquatic and semi-aquatic systems. A detailed description of potential direct, indirect, adverse, and beneficial impacts on fish and aquatic resources is included in Section 3.2.2.4.2.

Following proper implementation of design features of the Proposed Action and Selective Mitigation Measures 2, 5, 7, and 11; impacts on fish and aquatic resources would be mostly avoided. Where impacts on fish and aquatic resources cannot be avoided, implementation of site-specific design features detailed in the Project POD would reduce the potential for impacts to occur and would mitigate adverse effects on the resource.

Alternatives COUT-H (Applicant Preferred Alternative) and COUT-I

Siting Area E – Bonanza

Affected Environment and Environmental Consequences

Alternatives COUT-H and COUT-I have the same affected environment and environmental consequences for Siting Area E as Alternative COUT-C and route variations.