**U.S. Department of the Interior**
**Bureau of Land Management**

**Pinedale Field Office**

# DRAFT
# ENVIRONMENTAL ASSESSMENT

# PARADISE 230-kV TRANSMISSION PROJECT

## PacifiCorp, Inc.

## WY-100-EA09-32

## April 2009

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A Surface Disturbance
B Schematics
C Owner Committed Measures
D Biological Assessment
E Visual Impacts Assessment

# 1.0 PURPOSE AND NEED FOR THE ACTION

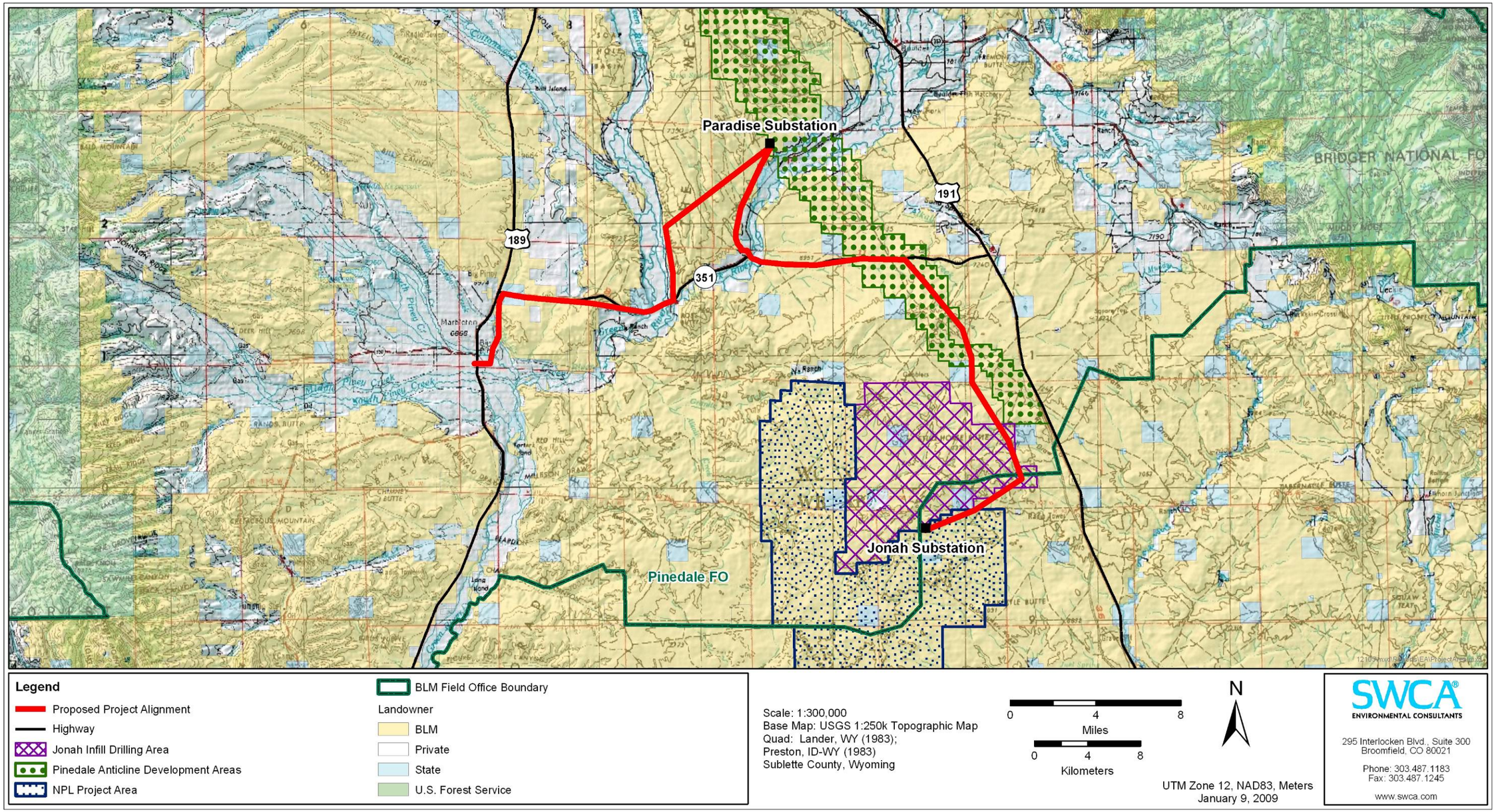
## 1.1 INTRODUCTION

Rocky Mountain Power, a division of PacifiCorp, Inc., has filed joint applications with the Bureau of Land Management (BLM) Pinedale Field Office (PFO) and Rock Springs Field Office (RSFO) for the construction, operation, and maintenance of a 230-kilovolt (kV) overhead transmission line and two new substations in Sublette County, Wyoming. The proposed project, called the Paradise 230-kV Transmission Project (Project), would add infrastructure to complete a loop of high-voltage power between the Jonah Gas Field area and the Paradise Road area near the New Fork River, and to the Big Piney Substation in Big Piney, Wyoming. The BLM has identified the PFO as the lead federal agency and has determined that an Environmental Assessment (EA) will be prepared in compliance with the National Environmental Policy Act of 1969 (NEPA).

The purpose of the Project is to construct additional transmission, substation, and distribution infrastructure to serve growing industrial, commercial, and residential electrical loads in the region. Further, the Project would improve reliability of electrical service to commercial and residential customers located in and around Pinedale, Wyoming, by providing a new 230-kV substation and important new double circuit infrastructure connecting into the existing infrastructure serving the entire Pinedale area. This EA will assist the BLM with identification of any potentially significant impacts that could result from implementation of the proposed action, and in making the final determination for any federal action. The EA provides a site-specific analysis of potential impacts to resources within federal jurisdiction that could result from the implementation of any of the possible action alternatives meeting the Project purpose and need, compared with the possible effects of no action. If the BLM determines that “no significant impact” would result from the Preferred Alternative, a Finding of No Significant Impact (FONSI) would be prepared approving the action. Should significant impacts to resources be identified, the agency may determine that preparation of an Environmental Impact Statement (EIS) is required.

### 1.1.1 Description of the Project Area

The Project Area is illustrated in Map 1-1. The southern terminus of the overall Project Area is the proposed Jonah Substation, in Section 9 of Township (T) 28 North (N), Range (R) 108 West (W). The northern extent of the overall Project Area is the proposed Paradise Substation in Section 9 of T31N, R109W. The eastern extent of the overall Project Area is defined by U.S. Highway 191 (U.S. 191). The western extent of the overall Project Area is defined by the Big Piney Substation in Big Piney, Wyoming. The Project Area also includes 40-acre parcels at the proposed substation locations. The majority of surface ownership for the Project Area for the right-of-way (ROW) corridor and substations is federally administered, with small tracts of private and state acreage. The entire Project Area lies within Sublette County, Wyoming. Additional studies and detailed analyses were conducted on the substation locations and an area defined as the proposed and alternative 150-foot ROW corridor for the transmission line, with an additional survey corridor width of 75 feet on either side of the ROW for resource evaluations.




**Map 1-1. Project Location.**

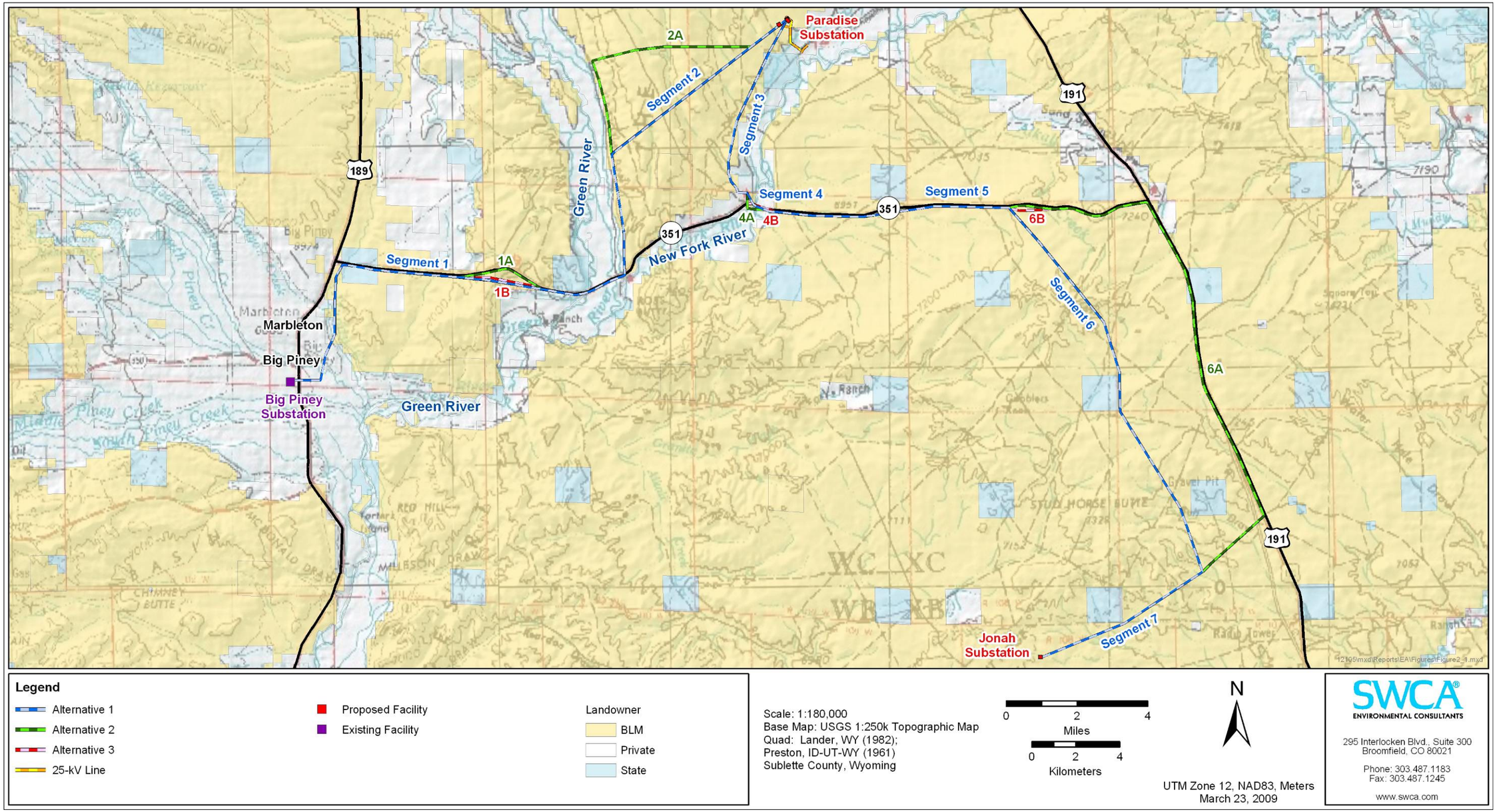
### 1.1.2 Project Description

The proposed Project consists of electrical infrastructure development including the acquisition of an electrical transmission ROW grant, 150 feet wide and approximately 55 miles long, for a 230-kV and 69-kV transmission line; a ROW grant for an 8-acre substation on BLM land north of Paradise Road; and a ROW grant for an 8-acre substation on BLM land just south of the Jonah Gas Field. A map of the proposed Project infrastructure is provided in Map 1-2, and schematics of the Project facilities are provided in Appendix A.

The first section of transmission line would begin at the existing Big Piney Substation in Big Piney, Wyoming, on the west side of U.S. 189. The single circuit 230-kV transmission line would be constructed on wood two-pole H-frame structures with three-pole structures approximately every 2 miles. Angles and turns in the transmission line would require three-pole structures to maintain the strength and integrity of the transmission line. The alignment would proceed east from the substation, then north until nearing the intersection of U.S. 189 and State Highway (SH) 351. The line would then turn east and proceed along the south side of SH 351 and parallel to an existing 69-kV transmission, crossing public and private lands and the Green River, to terminate at a point on SH 351 where the existing 69-kV line turns north. The new 230-kV line would continue to parallel the existing line, but would be constructed on double circuit 230/69-kV COR-TEN steel monopoles from SH 351 until it reaches the Paradise Substation. The existing 69-kV line would be moved from the existing wood poles to the new steel monopoles along this segment of the line.

A new Paradise Substation would be located near Paradise Road in Sublette County, Wyoming. A short section of double circuit 25-kV distribution line would be constructed between the Paradise Substation to nearby existing distribution lines near Paradise Road approximately 1 mile long on single wooden pole structures. The tie-in with the local distribution lines would complete an electrical circuit to serve customers and provide system stability in the Pinedale and northern Pinedale Anticline Area.

A new single circuit 230-kV transmission line would be constructed heading southwest from the new Paradise Substation on wood H-frame structures, with a three-pole structure approximately every 2 miles. This section of transmission line would cross SH 351 near the New Fork River Bridge. At the New Fork River crossing, the line would be constructed on single circuit COR-TEN steel monopoles. After crossing the river, the transmission line would remain on the south side of the highway and be constructed of wooden H-frame structures with occasional three-pole structures. The transmission line would continue east for approximately 7 miles, then south and southwest to terminate at a new proposed Jonah Substation just south of the Jonah Gas Field. The transmission lines in this area would complete an electrical circuit to serve customers and provide system stability in the Jonah Gas Field and south Pinedale Anticline Area.




**Map 1-2. Proposed Project Infrastructure.**

## 1.2 PURPOSE AND NEED

The demand for electricity has increased dramatically in and around Pinedale, Wyoming, during the last several years due to an increase in natural gas and oil production and transportation, an increase in secondary support services, and the resulting increase in human population with growing residential electricity requirements. In addition, changes to air quality regulations in the area require natural gas transmission companies to use electrical driven compressors to transport their product. This growth has outstripped the current capabilities of the existing electrical system in the area and drives the need for new, high-voltage transmission infrastructure to ensure continued, reliable electric service.

Distribution peak load in the area has increased from 20 megawatts (MW) to 26 MW in the recent two-year period and Rocky Mountain Power anticipates a 43-MW peak by 2009. Rocky Mountain Power has also received requests from natural gas companies and related services for additional transmission load increases of 150 MW and distribution load increases of 70 MW. Further, the existing 69-kV transmission line servicing the region has demand that exceeds capacity and there is no current 230-kV electrical service in the Upper Green River area.

The purpose of the Proposed Action is to construct additional transmission, substation, and tie-in infrastructure to existing transmission and distribution infrastructure in order to provide reliable electric service to growing industrial and commercial industries and residential customers located in the Upper Green River Basin. The proposed Project would provide a flexible backbone infrastructure to support current and future electrical demands by establishing a loop of high-voltage power between the Jonah Gas Field area and the Paradise Road area near the New Fork River, and to the Big Piney Substation in Big Piney, Wyoming. The construction of two new high-voltage substations would substantially increase electrical service reliability to meet the growing demand.

### 1.2.1 Conformance with Land Use Plans

The document that directs management on federal lands within the PFO is the 2008 Pinedale Resource Management Plan (RMP) and Record of Decision (ROD) (BLM 2008a). The document that directs management decisions of the RSFO is the 1997 Green River Resource Management Plan (GRRMP) (BLM 1997a). Specific management objectives for ROW applications for electrical transmission lines are not specified in the Pinedale RMP or in the GRRMP, except as standard practices, Best Management Practices, and guidelines for surface-disturbing activities.

The development of high-voltage power within the Project Area is in conformance with the Pinedale RMP (BLM 2008a) and the GRRMP (BLM 1997a), subject to all applicable standard practices, Best Management Practices, and mitigation.

### 1.2.2 Relationship to NEPA and Other Statutes and Regulations

The Proposed Action will be analyzed in accordance with the requirements of NEPA. To comply with NEPA and applicable Council on Environmental Quality (CEQ) regulations that implement NEPA, the BLM is required to prepare an EA. This environmental document, which is the EA for this Project, will serve the following purposes:

- provide the public and governmental agencies with information about the potential environmental consequences of the Project and alternatives;
- identify all practicable means to avoid or minimize environmental harm from the Project and alternatives; and
- provide the responsible official with information upon which to make an informed decision regarding the Project.

In addition to conformance with NEPA and the Pinedale RMP and the GRRMP, the Proposed Action would comply with all applicable federal, state, and local statutes, regulations, and plans. Table 1-1 identifies the federal and state agencies with potential jurisdiction over the Proposed Action, and the potential permits that may be needed based on final design.

### 1.2.3 Decision to be Made

The decision to be made by BLM, based on the EA, is the granting of ROW permits on public land for the proposed high-voltage transmission line, substations, and distribution connection line. The BLM must decide whether or not to approve the proponent's proposal, and, if approved, by which route the transmission line should be constructed. The BLM will base that decision, and the conditions of that decision, on the analyses and information contained in the EA, and in consideration of the comments received by the BLM pertaining to the Project.

### 1.2.4 Scoping and Development of Issues

The scoping period began on May 13, 2008, with publication of a request for public comment on the Wyoming BLM website. The scoping notice indicated that comments would be accepted through June 13, 2008. The purpose of "scoping" was to identify issues important to the Project EA and to assist BLM in identifying issues to be evaluated in the EA. The BLM accepted scoping comments via letter, fax, and electronic mail during the scoping period. The comment period was extended until July 14, 2008, at the request of the Wyoming Game and Fish Department (WGFD).

During the official scoping period, the BLM received 15 separate comments from 6 respondents. The Wildlife category received the most comments for a specific topic (33.3%). Other categories that received more than one comment include Visual Resources with 20% of the comments, and Socioeconomics with 20%. Other topics received one comment each.

### 1.2.5 Key Issues

Following are the key issues raised by the BLM interdisciplinary team and the public and given special consideration in the EA.

- Potential impacts to the character and visual setting of historic trails.
- Potential impacts to other sensitive visual resources.
- Potential impacts to wildlife resources, including sage grouse, prairie dogs, raptors, and big game migration corridors.
- Potential impacts to socioeconomics in the region, including changes in residential land values near the proposed Project.

**Table 1-1. Major Authorizations, Permits, and Approvals.**

| Action Requiring Permit, Approval, or Review | Responsible Agency | Permit or Approval | Statutory Reference |
|---|---|---|---|
| **Federal** | | | |
| Powerline construction and operation on land under federal management | Bureau of Land Management (BLM) | Right-of-Way (ROW) Grant | Federal Land Policy Management Act of 1976 (FLPMA); Public Law (PL) 94-579 |
| | BLM | Finding of No Significant Impact or Record of Decision | National Environmental Policy Act (NEPA); Council on Environmental Quality; 40 Code of Federal Regulation (CFR) Part 1500 et seq. |
| | U.S. Fish and Wildlife Service (FWS) | No Effect or Not Likely to Adversely Affect Determination | Endangered Species Act (ESA) Section 7 |
| | BLM and State Historic Preservation Office | Section 106 Compliance | National Historic Preservation Act (NHPA) of 1966; 36 CFR part 800; 16 United States Code (USC) 47 |
| Placement of fill or discharge in jurisdictional area | U.S. Army Corps of Engineers | Clean Water Act Section 404/401 Compliance | Clean Water Act, Section 404/401 |
| **State of Wyoming** | | | |
| Encroachment into State Highway ROW | Wyoming Department of Transportation (WYDOT) | ROW Occupancy Permit | Wyoming High Voltage Power Lines and Safety Restrictions Act (Wyoming Statute [WS] 37-3-301 through 37-3-306) |
| Transmission line crossing of State Lands | WY State Land Board | Grant of Easement | WS 36-2-107 and WS 36-9-118 |
| Use of State Highways for oversized vehicles | WYDOT | Permit for Oversize, Overlength, and Overweight Loads | WYDOT Rules and Regulations Chapters 17, 20 |
| **Local** | | | |
| County road access and crossings | Sublette County | Engineering Department | County Road Access and Crossing Permits |

# 2.0 PROPOSED ACTION AND ALTERNATIVES

## 2.1 INTRODUCTION

BLM is considering the Proposed Action and two other Action Alternatives, along with No Action, relative to the Project. These alternatives are described in this chapter. Several project elements such as design features and construction techniques would be used by PacifiCorp in the event that any of the Action Alternatives are decided upon. These are identified separately in the following subsection. Other possible alternatives were considered in the course of development of the EA. These are also included in this chapter, but have been dismissed from further consideration.

### 2.1.1 Project Elements Common to the Proposed Action and All Action Alternatives

#### 2.1.1.1 Transmission Line Design

The design, construction, operation, and maintenance of the new 230-kV transmission lines would meet or exceed the requirements of the National Electrical Safety Code (NESC), U.S. Department of Labor Occupational Safety and Health Standards, and Rocky Mountain Power's requirements for safety and protection of landowners and their property. Engineering plans, drawings, and construction stipulations are currently being prepared by Rocky Mountain Power.

*Structures*

The new transmission line structures would be a combination of two-pole H-frame structures, three-pole structures, and steel monopole structures. All would include avian-safe design features and would be approximately 80 to 100 feet above the ground surface. The H-frame construction would be used where there is a single circuit 230-kV line, and would require three-pole structures approximately every 2 miles for added strength and stability. The steel monopoles would be used with the double circuit 230/69-kV line. In some instances where additional height is needed for clearance of roads or rivers, steel poles may be substituted for wood on the H-frame. Structures would be spaced approximately every 500 to 1,000 feet, except where the line is double circuit 230/69-kV in which case the spacing would be approximately 300 to 700 feet. The exact height of each structure and spacing would be governed by topography, final design, and safety requirements for conductor clearances and line loading.

*Conductors*

The 230-kV line would consist of three conductors forming the three-phase single circuit, with an Optical Ground Wire in the top position and a static wire on the opposite top position on each structure. The 230/69-kV line would consist of a three-phase single circuit 230-kV and three-phase single circuit 69-kV with an Optical Ground Wire in the top position on each structure. Minimum conductor height above ground would be based on NESC and Rocky Mountain Power's standards. Conductors would be non-reflective.

*Insulators and Associated Hardware*

The tangent structures of the 230-kV line would have polymer suspension insulators 80 to 86 inches long. The angle and dead end structures would have polymer insulators 92 to 99 inches long. One polymer insulator per phase would be used on all of the tangent structures and up to

three insulators per phase on the dead end and angle structures would be used. All angle and dead end structures would have associated down guying, except where steel poles with foundations are used.

#### 2.1.1.2 Construction

Construction would commence once the BLM ROW grant and notice to proceed are obtained outside all seasonal wildlife timing restrictions. Construction is expected to take approximately 30 weeks to complete and would involve approximately 35 construction personnel in the Project Area at any time.

The construction of the substations would begin with excavation of the site surface to remove the top soil layer and unwanted contours. The substation site would be graded so that falling moisture would not pool, but would be directed away from the substation site. The sites would be graded for the appropriate contours and civil work would take place in the auguring of holes for drilled cement piers and further excavation for other foundation work. The graded site would be covered with rock/gravel to attain the desired final grade. Steel structural support would be installed followed by the installation of the electrical equipment such as breakers, transformers, control houses, etc. An 8-foot fence with gating would surround the substation when completed. Drainage would be engineered as to not cause any erosion issues on adjacent lands.

*Structure Sites Clearing*

At each structure site, leveled areas, called pads, would be needed to facilitate the safe operation of equipment such as construction cranes. The leveled areas required for the location and safe operation of large cranes would be approximately 50 by 50 feet. The work areas would be cleared of vegetation only to the extent necessary. After line construction, all pads would be graded to blend as near as possible with the natural contours and the disturbed area reseeded as necessary, keeping in mind these leveled areas would need to remain as accessible as possible for future maintenance when needed.

*Pulling and Tensioning Site Clearing*

Conductor pulling sites would be located at approximately 2-mile increments along the assumed centerline of the Project. If sites exceed the 150-foot ROW corridor width, a temporary-use permit would be obtained. The leveled areas required for the location and safe operation of stringing and tensioning equipment would be approximately 100 feet wide by 200 feet long. The areas needed for the pulling sites would be approximately 150 feet wide by 400 feet long. As with structure sites, the work areas would be cleared of vegetation only to the extent necessary. After line construction, areas would be graded to blend as near as possible with the natural contours and revegetated where required.

Rocky Mountain Power would use, to a practicable extent, existing disturbed areas for construction staging areas. Other staging areas on private lands may be required, and would be coordinated by the contractor with the landowner in advance of construction.

## 2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the new 230-kV electrical transmission infrastructure, including high-voltage powerlines and substations, would not be constructed and PacifiCorp would not be able to meet the requests of additional and reliable electricity in the Project Area. With no action, the nearest available high-voltage electrical power would be the 230-kV powerline south of the Jonah Gas Field, and the 69-kV transmission line located between Big Piney and Pinedale, Wyoming. The nearest high-voltage substation would be the 69-kV substations located in Big Piney and in Pinedale, Wyoming.

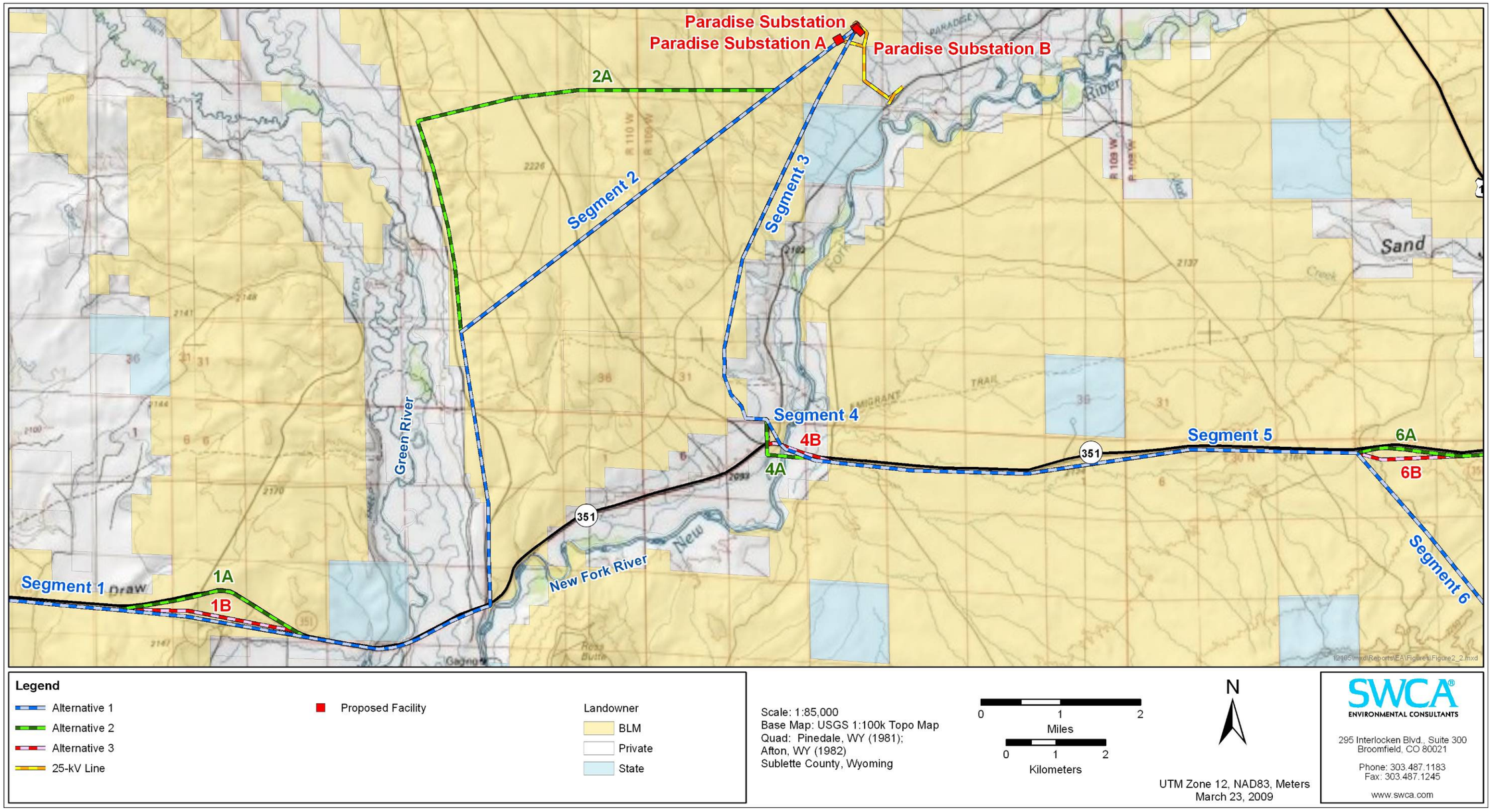
The residents of the town of Pinedale, and the industries and commercial interests in the Mesa, north Anticline, Sand Draw, and Jonah Gas Field areas, would continue to be serviced by existing 25-kV electricity distribution lines originating in the Rocky Mountain Power 69-kV substation in Pinedale. This electricity is currently supplemented by diesel-generators during peak wintertime energy demands. The existing radial system would not have access to other substations or a transmission loop to provide a back-up source of electricity in the event of an outage at the existing Pinedale or Big Piney substations.

Other sources of power include diesel-generated or natural gas-generated power supplies for industrial and commercial establishments currently without electrical service. The use of diesel and gas for back-up and for individual industrial power sources would increase under the No Action Alternative.

## 2.3 ALTERNATIVE 1 – PROPOSED ACTION

The Proposed Action components are described as segments which have similar proposed structures and resource constraints. The use of segments highlights potential impacts and alternative design solutions for comparison with other Action Alternatives. Map 1-2 shows the location of the segments of the Proposed Action within the Project Area and provides an overview of Alternatives 1, 2, and 3 within the Project Area. Map 2-1 provides detail of the Alternatives for the area between the Green River and the New Fork River.

- Segment 1. This segment would consist of 10.89 miles of single circuit 230-kV wood pole H-frame structures with three-pole structures every 2 miles. The design and construction of the structures is described in Section 2.1.1. The segment would begin at the Big Piney Substation located within the town limits of Big Piney, Wyoming, and terminate just west of the Green River. Along SH 351, the transmission line would be aligned parallel to an existing 69-kV transmission/distribution line, which is along the south side of SH 351 and parallel to the ROW, except for approximately 2 miles, where the highway veers north and away from the existing transmission line ROW.




**Map 2-1. Comparison of Alternatives between the Green River and New Fork River.**

- Segment 2. This proposed segment would consist of 11.11 miles of double circuit 230/69-kV COR-TEN steel monopole structures, as described in Section 2.1.1. The 230/69-kV segment intercepts another utility line near the Green River Road. The existing utility includes a single circuit 69-kV transmission line on wooden structures and a 25-kV distribution line. Three 69-kV electrical switches would be installed on the proposed transmission structures where the new 69-kV line intersects with the existing 69-kV line. The existing 25-kV distribution line would remain in place on the existing wooden structures, which would be shortened. The new 230-kV/69-kV segment would generally parallel the existing distribution line to cross the Green River and follow Green River Road for approximately 3 miles, then head northeast across The Mesa to a proposed substation.
- Paradise Substation and 25-kV Distribution line. The proposed Paradise Substation would be located approximately 1 mile northwest of Paradise Road. The substation would be constructed on a 15-acre parcel north of the New Fork River, in the jurisdiction of the BLM PFO. The initial construction disturbance would be approximately 15 acres, but reclamation would result in final permanent disturbance of 8 acres. The substation would be excavated to a depth of 16 to 22 inches, with gravel replacement. Equipment foundations would be concrete pier structures 2.5 feet in diameter and 6 to 9 feet deep. Chain-link fencing would surround the yard. This substation would step down voltage to 69/25 kV. Two new 25-kV distribution lines would be constructed from the substation onto adjacent BLM land on the north and east of the substation fence. The two lines would merge into a double circuit on single poles south of the substation and proceed to the south to tie into existing distribution lines near Paradise Road. The purpose of this line would be to complete the electrical circuit between the existing Big Piney Substation, the new Paradise Substation, and the existing Pinedale Substation.
- Segment 3. This segment would consist of approximately 5.33 miles of single circuit 230-kV wood pole H-frame structures, constructed as described in Section 2.1.1. The segment would begin at the proposed Paradise Substation, and terminate just south of the intersection of Paradise Road and SH 351. The alignment would be approximately 0.5 mile west of and roughly parallel to Paradise Road.
- Segment 4. The proposed crossing of the New Fork would consist of approximately 1 mile of single circuit 230-kV transmission line, constructed as described in Section 2.1.1. The segment would terminate on the south side of SH 351 and the eastern edge of the New Fork River floodplain.
- Segment 5. This segment would parallel the south side of SH 351 from the eastern edge of the New Fork River floodplain for approximately 6.83 miles and consist of single circuit 230-kV transmission line, constructed as described in Section 2.1.1.
- Segment 6. This segment would diverge from the southern side of SH 351 and head south by southeast across country for approximately 11.92 miles. The proposed transmission line would consist of single circuit 230-kV transmission line, constructed as described in Section 2.1.1. The segment would terminate in Section 28 of T29N, R107W.
- Segment 7. This segment would consist of single circuit 230-kV transmission line, constructed as described in Section 2.1.1. Beginning in Section 28 where Segment 6

terminates, the alignment would head in a west by southwest direction to terminate at the Jonah Substation.

- Jonah Substation. The substation would be constructed on a 15-acre parcel near the Jonah Gas Gathering primary delivery point, in the jurisdiction of the BLM RSFO. The initial construction disturbance would be approximately 15 acres, but reclamation would result in final permanent disturbance of 8 acres. The equipment yard would be constructed similar to the Paradise Substation.

As shown in Table 2-1, Alternative 1 would have an initial surface disturbance of 998.55 acres. After reclamation, the long-term surface would be 79.60 acres, resulting from pole structures, substations, and an informal two-track road. Detailed information on surface disturbance is provided in Appendix A. It is anticipated that construction of the Proposed Action, if authorized by BLM with a ROW grant and notice to proceed, and if outside all seasonal wildlife timing restrictions, would begin in July 2009 with the construction of the Paradise Substation and the 230/69-kV line from the Paradise Substation to the intersection of the Big Piney to Pinedale 69-kV line. These project components are needed for improved reliability of electrical supply for the town of Pinedale beginning in the winter of 2009. It is estimated that the remainder of the transmission line and Jonah Substation construction would be complete and operational by November 2010.

**Table 2-1. Summary Information on Paradise 230-kV Transmission Project Alternatives.**

| Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|
| Segment 1 | Segment 1A | Segment 1B |
| Segment 2 | Segment 2A | Segment 2 |
| Paradise Substation | Paradise Substation A | Paradise Substation B |
| Segment 3 | Segment 3 | Segment 3 |
| Segment 4 | Segment 4A | Segment 4B |
| Segment 5 | Segment 5 | Segment 5 |
| Segment 6 | Segment 6A | Segment 6B |
| Segment 7 | Segment 7 | Segment 7 |
| Jonah Substation | Jonah Substation | Jonah Substation |
| Alternative 1 Initial Surface Disturbance of 998.55 Acres | Alternative 2 Initial Surface Disturbance of 1,106.04 Acres | Alternative 3 Initial Surface Disturbance of 1,073.82 Acres |
| Long-term Surface Disturbance of 79.60 Acres | Long-term Surface Disturbance of 87.66 Acres | Long-term Surface Disturbance of 84.58 Acres |

## 2.4 ALTERNATIVE 2

In consideration of different resource values present in Alternative 1 - Proposed Action segments, alternative segment alignments were developed to avoid or minimize potentially adverse impacts within four segments and a second substation location. Some segments and the Jonah Substation remain the same as in Alternative 1, as indicated in Table 2-1. In

combination, Alternative 2 forms a complete action alternative meeting the Project Purpose and Need.

- Segment 1A. This segment would include the same transmission structures, conductors, and circuits as the Proposed Action. Alignment of the transmission structures would follow the toe of a hill slope near the southern ROW of SH 351 rather than following the alignment of the 69-kV transmission line. The total length of this segment alternative would be 11.04 miles.
- Segment 2A. The alternative to Segment 2 would include a north/south alignment following Green River Road before making a turn to the east, eventually intercepting the proposed alignment. The total length of Segment 2A would be 13.38 miles. The transmission structures, conductors, and circuits would be the same as the Proposed Action.
- Paradise Substation A and 25-kV distribution line. An alternative location for the Paradise Substation would be approximately 0.10 mile west of the proposed substation, on the west side of a gravel road. The design and construction of the substation would be the same as the Proposed Action.
- Segment 4A. The alternative alignment would begin on private land near the southeastern corner of a gravel pit. Segment 4A would then head approximately 0.5 mile south, then turn due east and cross the New Fork River and the floodplain before intercepting Segment 5 near the South Boulder Road intersection. The total length of Segment 4A would be 1.3 miles.
- Segment 6A. This alternative segment would continue on the south side of SH 351 until reaching the intersection with U.S. 191 at Sand Draw. The alternative would then remain on the east side of U.S. 191 and parallel the ROW fence for approximately 9 miles south. The transmission line would then make a sharp turn and head southwest for approximately 2.3 miles. The total length of the Segment 6A would be 15.96 miles. The transmission structures, conductors, and circuits would be the same as the Proposed Action.

As shown in Table 2-1, the total initial disturbance of Alternative 2 would be approximately 1,106.04 acres. After reclamation, the long-term disturbance and loss of habitat values would be approximately 87.66 acres. Detailed assumptions and calculations of surface disturbance can be found in Appendix A.

## 2.5 ALTERNATIVE 3 – BLM PREFERED ALTERNATIVE

In addition to the alternative segments and substation developed for Alternative 2, Alternative 3 was developed to avoid or minimize potentially adverse impacts. Some segments and the Jonah Substation remain the same as in Alternatives 1 or 2, as indicated in Table 2-1. In combination, Alternative 3 forms a complete action alternative meeting the Project Purpose and Need.

- Segment 1B. Alternative 3 would include the same transmission structures, conductors, and circuits as the Proposed Action. Alignment of the transmission structures would be adjusted slightly north of the existing 69-kV transmission line,

and approximately 0.5 mile south of the southern ROW of SH 351, as shown in Map 1-2.

- Paradise Substation B and 25-kV distribution line. Alternative 3 would include an alternative location for the Paradise Substation approximately 0.10 mile northeast of the proposed substation, on the east side of a gravel road, as shown in Map 1-2. The design and construction of the substation would be the same as the Proposed Action.
- Segment 4B. Alternative 3 would include a very short and perpendicular crossing of the New Fork River just south of the SH 351 ROW and parallel to the New Fork River Bridge.
- Segment 6B. Alternative 3 would have similar alignment as Alternative 2 for most of the length of the Project on the west side of U.S. 191. However, a slight modification occurs at the northern end of the segment along SH 351, as shown in Map 1-2.

As shown in Table 2-1, the total initial disturbance of Alternative 3 would be approximately 1,073.82 acres. After reclamation, the long-term disturbance and loss of habitat values would be approximately 84.58 acres. Detailed assumptions and calculations of surface disturbance for Alternative 3 can be found in Appendix A.

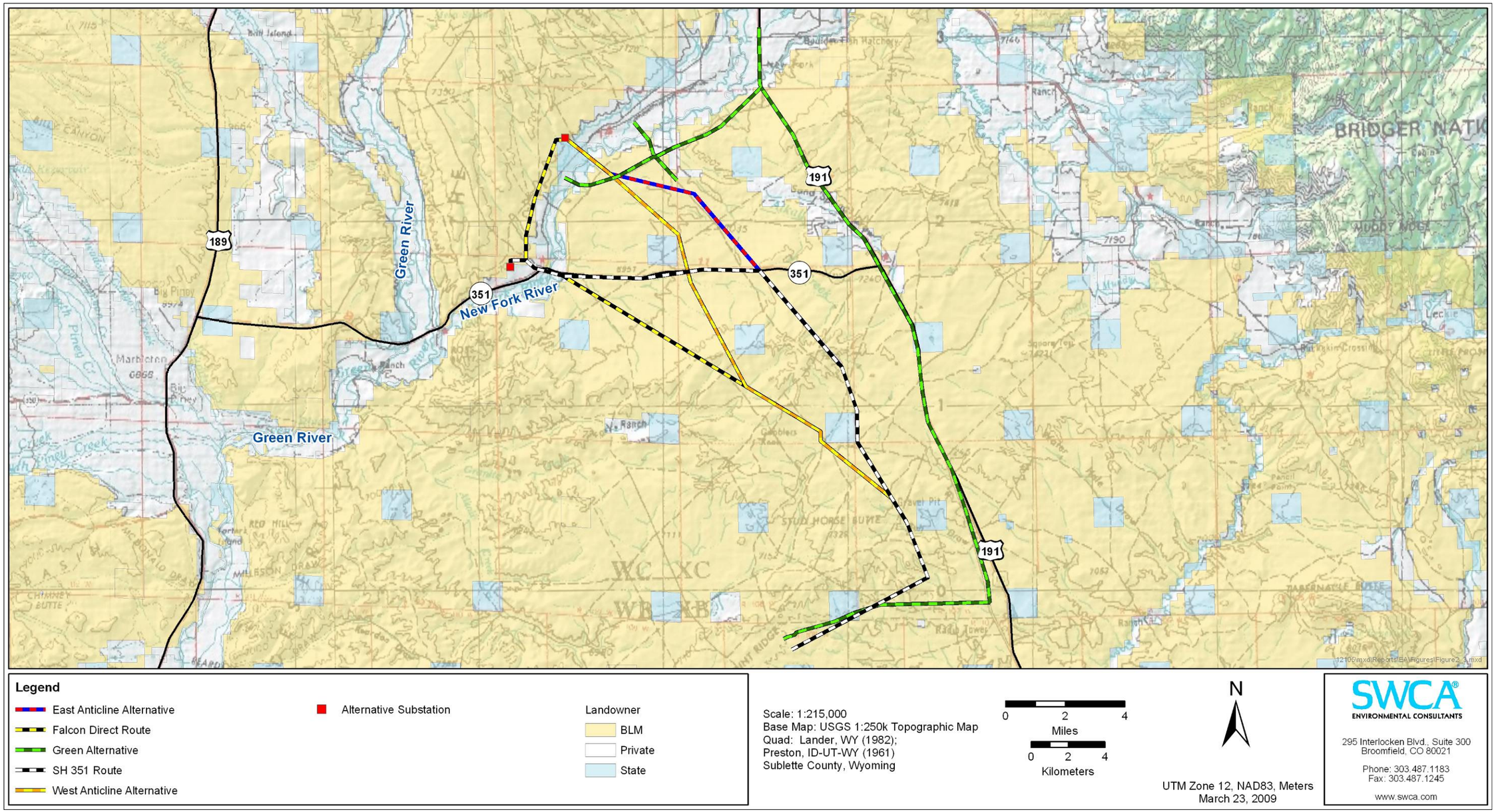
## 2.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The five alternatives listed below were identified and eliminated from detailed study based on significant adverse impacts to resource values or inability to meet the Project Purpose and Need (see Map 2-2).

- SH 351 North Alternative. A single circuit three-phase powerline would be constructed from a new switch station at the Jonah Field 230-kV powerline going east to U.S. 191, then following the west side of the highway ROW to a point just north of South Boulder Road. The powerline would then be constructed in a direction approximately west by southwest between South Boulder Road and the New Fork River, until crossing the New Fork River and terminating at the proposed Paradise Substation. This option was deemed to be unacceptable due to the crossing of the Lander Trail, also known as the Lander Road, near the current interpretive point, a possible second crossing or proximity to the trail with a distribution line from the Paradise Substation to serve a customer, and the proximity of cultural resources to the proposed substation site, cemetery, and abandoned town site. This alternative would have also crossed a larger portion of private property and affected more riparian lands.
- SH 351 South Alternative. The new Paradise Substation location would be located on the west side of the New Fork River approximately 4 miles southwest of the Paradise Road intersection with SH 351. Powerlines would roughly parallel the New Fork River to the west along SH 351. This alternative location for the Paradise Substation was eliminated because it would have required parallel powerlines to the northeast to service the customer demand. The parallel powerlines would have crossed the Lander Trail. The parallel powerlines would have also impacted more crucial mule deer winter range and placed the substation in an antelope migration corridor. Visual

Resource Management areas would have also been impacted more with the parallel powerlines.

- Paradise Substation #1. An alternative location for the Paradise Substation was considered near Paradise Road and approximately 1.5 miles southwest of the proposed location. This alternative was eliminated because the substation location would have been located in a crucial antelope migration route.
- Falcon Direct Alternative. From the proposed Jonah Substation, the single circuit 230-kV powerline would be constructed across country in a north by northeast direction, until clearing heavy well field development of the Jonah Gas Field. Then the powerline would change direction to the northwest and follow an alignment directly to the proposed crossing of the New Fork River just south of the SH 351 bridge. This alternative from the Falcon Compressor location to SH 351 was deemed unacceptable due to impacts to previously undisturbed wildlife habitat areas west of the Anticline gas development area.
- East Anticline Alternative. From the proposed Jonah Substation, the single circuit 230-kV powerline would be constructed across country in a north by northeast direction, until clearing heavy well field development of the Jonah Gas Field. Then the powerline would approximately follow South Anticline Road in a northern direction, crossing SH 351 and the Lander Trail in a perpendicular manner, then changing direction to head northwest and cross the New Fork River before terminating at the proposed Paradise Substation. This Alternative was eliminated because of adverse impacts to the visual setting of the historic Lander Trail, as well as conflicts with private land uses and antelope migration corridor bottleneck.




**Map 2-2. Alternatives Considered but Eliminated from Detailed Evaluation.**

# 3.0 AFFECTED ENVIRONMENT

## 3.1 NATURAL ENVIRONMENT

### 3.1.1 Physiography and Climate

Physiography, or landform, and the climate of the Project Area create the physical context for many other resources and human land uses that are discussed in other sections of this EA. Laws and regulations generally do not apply to these factors, but they combine to create the background for many other environmental conditions.

#### 3.1.1.1 Physiography of the Project Area

The Project Area lies within the northernmost portion of the greater Green River Basin, which is part of the Wyoming Basin Physiographic Province. The Wyoming Basin is typified by topographic and structural basins that are bound by the Rocky Mountains to the north, west, and southeast; the Great Plains to the east; and a small portion of the Colorado Plateau to the south (Howard and Williams 1972).

The Green River bisects the Project Area, flowing from north to south, with the New Fork River intercepting and flowing into it approximately in the middle of the Project Area. Other drainages in the Project Area are ephemeral, flowing only in response to snowmelt and rain events. Elevation ranges from approximately 6,800 to over 7,500 feet. Topographic relief within the Project Area vicinity typically ranges in height from 50 to 150 feet, and is generally characterized by gently rolling hills, mesas, and buttes with bluffs and floodplains along the Green and New Fork rivers.

#### 3.1.1.2 Climate of the Project Area

The climate in the region surrounding the Project Area is semiarid and continental, with short, dry summers and long, cold winters. The nearest weather station to the Project Area for which current data exists is in the town of Boulder at 6,940 feet elevation. Average annual temperatures range from 19.2 to 53.3 degrees Fahrenheit (°F) (Western Regional Climate Center [WRCC] 2008). January is typically the coldest month of the year, while July is the hottest. Average annual precipitation (including rain and the water equivalent of snow) was recorded at 9.4 inches from 1989 to 2007, while the average annual snow depth was 2 inches (WRCC 2008).

Prevailing winds are primarily out of the west and are frequent and often strong. The annual mean wind speed is 11.2 miles per hour (mph) and wind speeds in excess of 19 mph occur more than 12% of the time (BLM 1999).

### 3.1.2 Soils

Management goals and objectives associated with soils from applicable RMPs (BLM 2008a, 1997a) and land use plans for the State of Wyoming (Wyoming State Land Use Commission [WSLUC] 1979) and Sublette County (Sublette County Board of Commissioners [SCBC] and Sublette County Planning Commission [SCPC] 2003) are to prevent or mitigate impacts on soil stability, productivity, and water infiltration to prevent accelerated erosion and chemical degradation of the soil resource, and provide for optimal plant growth.

Soils within the Project Area are predominantly loamy Typic Torriorthents. Torriorthents form an alluvium derived from mixed sources and are shallow to deep and well drained. These are the dry Orthents of cool to hot, arid regions. They have an aridic (or torric) moisture regime and a temperature regime warmer than cryic. Generally, Torriorthents are neutral or calcareous and are on moderate to very steep slopes; a few are on gentle slopes. Many of the gently sloping soils are on rock pediments, are very shallow, have a sandy-skeletal particle-size class, or are salty. Others are on fans where sediments are recent but have little organic carbon. The vegetation on Torriorthents commonly is sparse and consists mostly of xerophytic shrubs and ephemeral grasses and forbs. The vegetation on a few of the soils is saltgrass. Torriorthents are used mainly for grazing and are extensive in the western United States (Soil Survey Staff 1999).

Soils across the area all have the characteristics of poor, shallow development, making them moderately erodible, especially in areas of steep slopes (Munn and Arneson 1999; BLM 2006).

Most of the soils in the Project Area have developed from residuum, or direct weathering, of the underlying formation sediments. The primary process of sediment movement across this landscape is slopewash, although other alluvial and colluvial processes have transported sediments in portions of the area. The soils most sensitive to disturbance are those developed from bedrock or glaciated bedrock and those occurring on areas of steep slopes (BLM 2006).

Coarse scale soil mapping of the entire Project Area has been conducted by the University of Wyoming Agricultural Experimental Station (Munn and Arneson 1999). High resolution Natural Resources Conservation Service (NRCS) soil unit mapping is not currently available for this area. Table 3-1 presents soil description and the acreage of each soil map unit in the Project Area under each segment of the proposed and alternative actions. Soils data indicate that soil map unit SU05 is the predominant soil type in the Project Area. No prime farmlands exist in the Project Area.

In some portions of the Project Area, soils exhibit characteristics that are associated with sensitive soils. Sensitive soils are generally limited in their suitability for road construction and may inhibit successful reclamation. Sensitive soils generally include those occupying steep slopes (greater than 25%) and/or those with physical and/or chemical characteristics that could accelerate the rate of soil erosion from disturbed areas and/or inhibit successful stabilization and reclamation of disturbed sites. The primary factors limiting soils use for road construction are shallow depth to rock, low strength, shrink-swell potential, frost action, flooding, and steep slopes. Reclamation potential is limited by alkalinity and salinity; excess stones, sand, clay, and/or lime; shallow depths; and steep slopes. Other characteristics that are indicative of soil sensitivity include low moisture holding capacity, wind erodibility hazard, high soil erosion factors, slow permeability, and saline soils.

**Table 3-1. Soil Types in the Project Area.**

| Soil Map Unit | Soil Description | Acres within Project Area |
|---|---|---|
| SU01 | Typic Torrifluvents, fine-silty and fine, mixed (calcareous), frigid-Typic Haplaquepts, fine-loamy and fine-loamy over sandy or sandy-skeletal, mixed (calcareous), frigid | 325 |
| SU02 | Aquic Haplustolls, coarse-loamy, mixed, frigid-Ustic Torriorthents, fine-loamy, mixed (calcareous), frigid-Typic Fluvaquents, fine-loamy, mixed (calcareous), frigid | 108 |
| SU03 | Rock outcrop-Typic Torriorthents, loamy, mixed (calcareous), frigid, shallow-Lithic Typic Torriorthents, loamy-skeletal, mixed (calcareous), frigid-Typic Natrargids, fine-loamy, mixed, frigid | 96 |
| SU05 | Typic Torriorthents, loamy, mixed (calcareous), frigid, shallow-Typic Haplocalcids, coarse-loamy, mixed, frigid-Lithic Torriorthents, loamy-skeletal, mixed (calcareous), frigid | 1,254 |
| SU06 | Ustic Calciargids, loamy-skeletal, mixed, frigid-Typic Haplocambids, loamy-skeletal, mixed, frigid-Typic Torriorthents, loamy-skeletal, mixed, frigid | 119 |
| SU07 | Ustic Torriorthents, fine loamy, mixed (calcareous), frigid-Ustic Torriorthents loamy, mixed (calcareous), frigid, shallow-Typic Haplocalcids, fine-loamy, mixed, frigid | 0 |
| SU09 | Typic and Lithic Torripsamments, mixed, frigid-Typic Torriorthents, loamy-skeletal, mixed, frigid-Rock Outcrop-Typic Halocambids, loamy-skeletal, mixed, frigid | 4 |

Soils in the planning area formed from a wide variety of geologic material, ranging from in situ geologic parent material rock (residuum) to material transported by wind (aeolian deposits), water (alluvium), gravity (colluvium), and ice (glacial till). These parent materials, along with variable climate, topography, vegetation, and management, produce soils with diverse characteristics. The Pinedale RMP (BLM 2008a) classified soils found in the planning area within five groups according to their geologic origin. The five soil classifications consist of Group I Soils of the Mountains, Group II Soils of the Foothills, Group III Piedmonts and Alluvial Fans, Group IV Soils of the Uplands, and Group V Soils of the Floodplains. Three of the five soil groups are located within the Project Area and are described in detail below. The soils data available for use on this Project is very limited coarse data and the soil names specific locations of the five soil groups defined in the Pinedale RMP (2008a) are unknown at this time.

*Geomorphic Group III—Piedmonts and Alluvial Fans*

Geomorphic Group III soils are found in the central western portion and along the mountains on the northeast edge of Sublette County, and are therefore outside of the Project Area.

*Geomorphic Group IV—Soils of the Uplands*

Geomorphic Group IV soils dominate portions of the Project Area. Residuum found over flat-lying sediments, dune-like aeolian deposits, and alluvium from the uplands are most

prominent. Generally, soils are alkaline, ranging from shallow to deep on nearly level to very steep (0 to 70%) slopes. Although usually well-drained, areas of shale uplands and badlands have clayey textures and salinity problems resulting in poor availability of moisture to plants. The combination of low precipitation, salinity, and excessively drained soils limits opportunities to mitigate impacts on soils. Generally, the soils of this group in the basins are formed in shales producing clayey textures, poor infiltration, high runoff, and high potential for slumping.

*Geomorphic Group V—Soils of the Floodplains*

Geomorphic Group V soils are associated with major drainages and are found in the Project Area. These nearly level to rolling (0 to 10% slopes) soils are generally deep, variable in texture, and derived from alluvium. Although usually productive, areas of saline-alkaline-affected soils limit vegetation production (BLM 1997b).

Upland soils constitute the majority of soil types in the Project Area. Upland soils generally correlate with soil map units SU03 Rock outcrop-Typic Torrioirthents, SU05 Typic Torriorthents, and SU07 Ustic Torrioirthents. Approximately 1,350 acres of the Project Area are comprised of Torrioirthents; the remaining 434 acres of the Project Area consist of soil map units SU01 Typic Torrifluvents, SU02 Aquic Haplustolls, and SU09 Typic and Lithic Torripsamments.

#### 3.1.2.1 Soil Conditions and Characteristics

The soils in the Pinedale RMP planning area possess several limitations that reduce the potential for establishing vegetation following a disturbance. Soils with limitations include highly erodible, saline, sodic, and sandy soils. Soils considered susceptible to these limiting features are discussed in the following subsections.

*Highly Erodible Soils*

Highly erodible soils are characterized by the loss of valuable topsoil resulting from action by either wind or water. Erosion increases when the vegetative community is disturbed by intense grazing, fire, road construction, or any other use that reduces the amount of vegetative cover. Several red soils in the Pinedale RMP planning area have a history of erodibility when disturbed. Typic Cryorthents, such as Cundick, are an example of a soil type that is within the Pinedale RMP planning area that is highly erodible. Due to the limited soil data for use in this analysis, it is unknown if Cundick soils are within the boundaries of the proposed transmission line ROW.

*Saline Soils*

Saline soils have calcium, magnesium, or other nonsodium salts dominating their ionic composition, although they might also contain some sodium salts. Soil salinity can have significant effects on soil erosion and reclamation potential. Because erosion of saline soils can also have significant effects on downstream water quality, saline soils are managed to minimize impacts in these areas and to promote the revegetation of previously disturbed areas to the greatest extent possible. Typic Torrifluvent soils such as Chrisman, Dines, and Laney are saline soils that are present in the Pinedale RMP planning area. The Sandbranch Typic Natrargids and Cambarge Typic Haplocalcids are some of the soils in the planning area that have high salt contents (BLM 2002a, 1990). Typic Torrifluvents and Typic Haplocalcids soils

occur within the Project Area; however, due to limited available soil data, specific locations and soil names that occur within the Project Area are not currently available.

*Sodic Soils*

The ionic composition of sodic soils is dominated by sodium salts. Soils with sodium adsorption ratios (SAR) of 13 or greater are considered sodic. Infiltration of precipitation into these soils is reduced by the dispersion of soil particles caused by the higher levels of sodium. Reduced infiltration rates result in greater surface runoff rates and increased soil erosion and sediment yields. Many of these soils have a thin layer of less sodic soil above the sodic horizon; therefore, when this layer is disturbed or removed, the resulting impact can be irreversible. Soil series in the planning area with SAR values in excess of 13 include Blazon Ustic Torriorthents, Bosler Ustic Calciargids, Bodorumpe Typic Torripsamments, Cora Histic Cryaquepts, Dinnen Typic Haplocryolls, Haterton Typic Torriorthents, and Westvaco Typic Natrargids (BLM 2002a, 1990). Typic Torrifluvents soils occur within the Project Area; however, due to limited available soil data, specific locations and soil names that occur within the proposed Project Area are not currently available.

*Sandy Soils and Sand Dunes*

Sandy soils are highly susceptible to wind erosion, and efforts are made to avoid disturbing these areas. Sandy soil series located in the Pinedale RMP planning area include Koonich variant which is a Typic Torrriorthents and Space City which is a Typic Haplocalcids (BLM 1990). Typic Torrifluvents soils occur within the Project Area; however, due to limited available soil data, specific locations and soil names that occur within the Project Area are not currently available.

### 3.1.3 Paleontological Resources

Paleontological resources can provide information important to prehistory and can embody the distinctive characteristics of a type of organism, environment, period of time, or geographic region. According to the Pinedale RMP (BLM 2008a), the paleontological resource management goal of the PFO is to protect significant fossils and known paleontological resources from damage or destruction and facilitate suitable scientific, educational, and recreational use of fossils.

#### 3.1.3.1 Records of Fossils in the Project Area

To assist with the paleontological sensitivity assessment of the geologic units within the Project Area, published literature and fossil locality records were reviewed to 1) determine whether any previously recorded paleontological localities occur within the Project Area; 2) assess the potential for disturbance of these localities during construction; and 3) further evaluate the paleontological sensitivity within the Project Area. Records maintained by the PFO and RSFO, Denver Museum of Nature and Science, University of California Museum of Paleontology (UCMP), and University of Wyoming were searched. Twenty-seven localities have previously been recorded from within 1 mile of the area of potential effect (APE) for the Proposed Action. Specific formation data and fossil type is not available for these localities. Many localities are known from Sublette County, although specific location data is not available in many cases. Plants and vertebrates including fish, reptiles, and at least 23 species of mammals, are known from these localities. Additionally, numerous other fossil localities

from the same formations have been recorded elsewhere within Sublette County, although geographic coordinates and/or specimen data for these were not available at the time of this analysis (BLM unpublished data; West 1978; UCMP unpublished paleontology collections data). The UCMP database alone has 155 fossil localities documented within Sublette County. Three are vertebrate localities in the Green River Formation, 1 is a plant locality in the Green River Formation, 1 is an invertebrate locality in the Wasatch Formation, 148 are vertebrate localities in the Wasatch Formation, and the remaining 2 localities do not have the formation specified.

#### 3.1.3.2 Field Survey Results

The paleontological resource analysis included a field survey of the Proposed Action as well as alternative Segment 6A. Pedestrian field surveys were conducted on August 7 through 9, 2007; September 28 and 29, 2008; and November 10, 2008. Surveys were conducted by SWCA Environmental Consultants (SWCA) paleontologists Georgia E. Knauss and Lori S. Browne. As discussed with the PFO Paleontology Resource Coordinator, the pedestrian survey in the PFO area was limited to exposures of bedrock and included a 300-foot buffer along the northeast–southwest-trending portion of Segment 2 in Ranges 109W and 110W; all of Segment 3; a portion of Segment 5 in Sections 3 and 4, T30N, R108W; portions of Segment 6 along Blue Rim; and portions of Alternative 6A in Section 3, T30N, R108W and Sections 22, 23, and 28, T29N, R107W. The vegetated portions of the APE within the PFO area were visually inspected from the vehicle. This included the proposed location of the Paradise Substation. As discussed with the RSFO Paleontology Resource Coordinator, all portions of the APE were surveyed. These areas included all of Segment 7, as well as the proposed location of the Jonah Substation.

One fossil locality was newly documented during the field survey in Section 3, T30N, R108W along Segment 6A. An unidentified mammal tooth was collected at 080928-GEK-01 in badlands exposures along SH 351. This specimen will be transferred to the Denver Museum of Nature and Science for permanent storage. Numerous fragmentary bones were observed along Segment 6 in Section 3, T30N, R108W. However, these fragments were poorly preserved and unidentifiable, and therefore not collected. The occurrence of the fossil locality and bone fragments indicates the presence of subsurface fossils in this immediate area.

A 2007 survey (Bilbey et al. 2007) of portions of the adjacent Jonah Gas Field resulted in the documentation of 23 new fossil localities, demonstrating the high paleontological potential of this area. It is probable that the fact that so few fossils had been previously discovered in this area was the result of limited bedrock exposures, confusing and conflicting geologic mapping and terminology, and difficulties with access (Bilbey et al. 2007).

Occurrences of paleontological resources are closely related to the geologic units in which they are contained. The potential for finding important paleontological resources can be broadly predicted by the presence of the pertinent geologic units at or near the surface. Therefore, geologic mapping can be used as a proxy for assessing the potential for the occurrence of important paleontological resources. The paleontological sensitivities of each geologic unit to be impacted by the Proposed Action were evaluated using the BLM Potential Fossil Yield Classification (PFYC) system (U.S. Forest Service [USFS] 1996). The PFYC system assigns a class designation (Classes 1 through 5) to a geologic unit to illustrate its

paleontological potential. Class 1 geologic units have the lowest paleontological potential and are not likely to contain recognizable fossil remains; Class 5 geologic units have a very high paleontological potential and consistently and predictably produce scientifically significant fossils.

#### 3.1.3.3 Geologic Units within the Project Area

The study area is located in the New Fork-Big Sandy area in the northeastern Green River Basin (West 1978). According to published geologic mapping (Love and Christiansen 1985), the Project Area is immediately underlain by the following five geologic units, from oldest (bottom) to youngest (top).

1) Holocene-age gravel, pediment and fan deposits
2) Pleistocene- and Holocene-age alluvium and colluvium
3) Early and middle Eocene-age Laney Member of the Green River Formation
4) Early and middle Eocene-age undifferentiated New Fork Tongue of the early Eocene-age Wasatch Formation and Fontenelle Tongue of the early and middle Eocene-age Green River Formation
5) Late Paleocene- and early Eocene-age La Barge and Chappo members of the Wasatch Formation

Although nomenclature revisions of the above units have been proposed (Roehler 1991a) since Love and Christiansen's geologic mapping (1985), these new units have not yet been used for subsequent statewide geologic maps. Therefore, Love and Christiansen's nomenclature is used for this analysis. A discussion of these geologic units is presented below in ascending stratigraphic order. A summary of the affected geologic units within the Project Area is provided in Table 3-2.

*La Barge and Chappo members of the Wasatch Formation*

The Chappo Member is dominated by brightly colored red, maroon, reddish-brown, orange, ochre, tan, and gray mudstones with abundant white, tan, brown, gray, and red sandstone and conglomerate (Oriel 1962). In contrast to the La Barge Member, the Chappo Member also contains some to abundant beds of pisolotic limestone (Oriel 1962). The lower contact is also an angular unconformity, resting on Paleozoic rocks to the west and Cretaceous rocks to the east. Surface exposures of the Chappo Member are restricted by the overlying La Barge Member but exposed thicknesses range from 490 to 680 feet while well logs indicate thickness of 1,200 feet (Oriel 1962). Extensive vertebrate fossil collections indicate middle to late Tiffanian Age (late Paleocene) (Gunnell 1994). Thirty-three genera and 39 species have been identified from the Chappo type locality (Gunnell 1994). Taxa include multituberculates, marsupials, insectivores, pleisadapids and other early primates, phenacodontids, arctocyonids, hyopsodontids, mesonychids, vivveravids, and creodonts. This fauna has been interpreted as representing an open woodland, relatively seasonally dry paleoenvironment (Gunnell 1994).

**Table 3-2. Geologic Units Underlying the Project Area.**

| Geologic Unit | Fossil Types | PFYC System | Acres within Project Area |
|---|---|---|---|
| Gravel, pediment, and fan deposits | Pleistocene deposits may contain mineralized or partially mineralized remains; Holocene deposits are too young to contain fossils. | Class 2 | 126.67 |
| Alluvium and colluvium | Pleistocene deposits may contain mineralized or partially mineralized remains; Holocene deposits are too young to contain fossils. | Class 2 | 321.07 |
| Laney Member of the Green River Formation | Plants (leaves, wood, pollen, spores); invertebrates (gastropods, bivalves, ostracods); vertebrates (garpike, turtle, crocodile, lizard, mammal). | Class 4/5 | 110.88 |
| Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Plants and locally abundant and diverse vertebrate fauna (fish, reptiles, and mammals). | Class 5 | 1323.21 |
| La Barge and Chappo members of the Wasatch Formation | Plants; invertebrates (gastropods); and diverse vertebrate fauna (perissodactyls, condylarths, primates, carnivores, rodents). | Class 5 | 54.68 |

PFYC = Potential Fossil Yield Classification

The La Barge Member is also dominated by brightly colored mudstone with small lenses of sheet sandstone and locally present conglomeratic beds. The unit is overlain by the limestone beds of the Fontenelle Tongue of the Green River Formation. Due to the underlying erosional contact, thicknesses vary but are around 400 feet in the west increasing to as much as 1,500 feet subsurface to the east (Oriel 1962). Gazin (1962, 1965) reports 40 species in 31 genera characterize the La Barge fauna. The majority of the fauna is represented by perissodactyls and condylarths, but also includes a high diversity of primates, carnivores, and rodents (Breithaupt 1990).

Due to the high paleontological sensitivity of these members of the Wasatch Formation, they have been designated PFYC Class 5.

*Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation*

The early Eocene-age fluvial Wasatch Formation interfingers with and underlies the early and middle Eocene-age lacustrine Green River Formation (Roehler 1991a). Both of these formations exhibit rapid lateral facies changes, abrupt thickness changes, intraformational unconformities, and gradational contacts (Roehler 1991b).

The Fontenelle Tongue of the Green River Formation is composed of well-laminated buff to gray fine-grained calcareous sandstone, fine-grained gray muddy limestone, poorly indurated

fine-grained yellow sand, and calcareous gray blocky mudstone and shale. Some sandy ostracodal limestone is also present, and some strata contain fossil plant remains and impressions. Few vertebrate fossils have been discovered from this subunit of the Green River Formation. In general, the Wasatch Formation consists of predominantly grayish and red variegated mudstone with local coal, sandstone, and conglomerate lenses (Roehler 1991a). The New Fork Tongue of the Wasatch Formation consists of a sequence of variegated clay, shale, arkosic conglomerate, and cross-laminated sandstone. Fossils known from the New Fork Tongue include fish, reptiles, and mammals. Perissodactyl and condylarth fossils indicative of the "Lostcabinian" North American Land Mammal sub-age are the most abundant mammalian remains (West 1978). Because the Wasatch Formation contains locally diverse and abundant vertebrate fossils, the undifferentiated Fontenelle and New Fork tongues are designated PFYC Class 5 in this study.

*Laney Member of the Green River Formation*

The Laney Member of the Green River Formation is composed of black to gray-white, brown, and buff shale and fine shaley sand. Beds of "paper shales" are present, as well as gray, gray-brown, brown, buff, and yellow fine-grained marly to siliceous sandstones and poorly indurated sands. Numerous fossils have been collected from this unit in the greater Green River Basin. These include plants including leaves, wood, pollen and spores; invertebrates including gastropods, bivalves, and ostracods; and vertebrates including garpikes, crocodiles, turtles, lizards, and mammals (West 1978). Because of its diverse and locally abundant fossils, the Laney Member of the Green River Formation is highly sensitive and is designated as PFYC Class 4/5.

*Alluvium and Colluvium*

Surficial deposits of Pleistocene- and Holocene-age alluvium and colluvium occur locally within the Project Area. The alluvium consists of gravel, sand, silt, mud, and clay that forms alluvial remnants on dissected benches along stream drainages, and accumulates within modern stream drainages and on adjacent floodplains. The colluvium consists of earthflow, mudflow, landslide, and talus deposits (Love and Christiansen 1985).

Surficial deposits of Holocene age contain the unfossilized remains of modern taxa, and are too young to contain in situ fossils. Therefore, they have no paleontological sensitivity. Pleistocene-age surficial deposits, particularly alluvium, may contain mineralized or partially mineralized animal bones, invertebrates, and plant remains of paleontological significance. However, few occurrences of Pleistocene-age fossils from southwestern Wyoming have been recorded. Pleistocene- and Holocene-age alluvium and colluvium within the Project Area have low paleontological sensitivity, and are designated as PFYC Class 2.

*Holocene-age Gravel, Pediment, and Fan Deposits*

Holocene-age alluvium and gravel, pediment, and fan deposits are exposed within the Project Area. The alluvium consists of gravel, sand, silt mud, and clay that forms alluvial remnants on dissected benches along stream drainages, and accumulates within modern stream drainages and on adjacent floodplains (Love and Christiansen 1985). The gravel, pediment, and fan deposits may also contain some glacial deposits and Tertiary gravels.

Surficial deposits of Holocene age contain the unfossilized remains of modern taxa, and are too young to contain in situ fossils. Therefore, they have no paleontological sensitivity. Pleistocene-age surficial deposits may contain mineralized or partially mineralized animal bones, invertebrates, and plant remains of paleontological significance. Pleistocene- and Holocene-age gravel, pediment, and fan deposits within the Project Area have low paleontological sensitivity (PFYC Class 2).

### 3.1.4 Water Resources

Water resources within the Project Area are found in and adjacent to perennial, intermittent, and ephemeral stream drainages, and within underlying aquifers. The Project Area is located within the Green River Basin and is part of the Colorado River drainage system. Groundwater underlying the Project Area is contained within the Upper Colorado River Basin aquifer system and is located in the Green River Structural Basin. Water uses in the Project Area include domestic, agricultural, and industrial (energy).

Multiple regulations are associated with wetlands, and riparian zones, including Section 404 of the Clean Water Act; Executive Orders (EOs) 11990 (wetland protection) and 11988 (floodplain management) (see also Section 3.2.2, Wetlands, Floodplains, and Riparian). According to the U.S. Army Corps of Engineers (USACE), a wetland has hydrophytic vegetation, hydric soils, and hydrology (USACE 1987). Wetlands that meet these three criteria are referred to as jurisdictional wetlands. Jurisdictional wetlands and waters of the U.S. are regulated by the USACE under Section 404 of the Clean Water Act and require that the appropriate permitting be obtained prior to construction activities.

The State of Wyoming has primacy with regard to water quality. Water quality in the Project Area is monitored and regulated by the Wyoming Department of Environmental Quality (WDEQ) Water Quality Division. Monitoring results are summarized in WDEQ Integrated Water Quality Assessment Reports as required by Section 305(b) of the Clean Water Act; the most recent report was published in 2008 (WDEQ 2008). Additional groundwater and surface water quality within a 1-mile radius of existing and proposed development in the Pinedale Anticline Project Area (PAPA) has been conducted by the Sublette County Conservation District (SCCD) since 2004 (SCCD 2007; Cole 2008; Marshall 2008).

#### 3.1.4.1 Surface Water

The New Fork River, Green River, Muddy Creek, and North Piney Creek are the only perennial streams within the Project Area. Other streams within the Project Area are intermittent or ephemeral drainages that primarily exhibit short-term surface flows in response to snowmelt run-off or precipitation events. The PFO RMP indicates that Sand Draw and Alkali Creek are prone to flooding (BLM 2008a). In addition, temporary flooding may occur in any of the ephemeral draws after storm events. Other than limited wet periods following storm events, these ephemeral drainages are dry and exhibit extended periods of no flow. However, many of these drainages contain impoundments that create small reservoirs and stock ponds that may contain water for extended periods of time. There are also playas, or seasonal ponds, within the Project Area that contain standing water for extended periods.

There are numerous classifications for surface waters of the State of Wyoming. Except for Class 1 waters, waters are classified according to their designated uses. Designated uses include agriculture, fisheries, aquatic life other than fish, industry, drinking water, fish consumption, recreation, scenic value, and wildlife. The designated uses that are protected for a given surface water depend on the classification of that water. For Class 1 waters, the existing water quality is protected regardless of the designated uses supported by the water (WDEQ 2001). The main stem of the Green River and adjacent wetlands, from the mouth of the New Fork River upstream to the wilderness boundary, is a Class 1 water. The remainder of the Green River is Class 2AB.

The majority of streams in the Project Area are Class 2AB and Class 3B. Descriptions of these classifications as set forth in the Wyoming Surface Water Quality Standards (WDEQ n.d.) are provided below.

Class 2AB waters are those known to support game fish populations, spawning, or nursery areas at least seasonally, and where drinking water use is attainable. Unless it is shown otherwise, Class 2AB waters are presumed to have sufficient water quality and quantity to support drinking water supplies and are protected for that use. Class 2AB waters are also protected for game fisheries, nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value uses. Class 2AB can be classified as either “cold water” or “warm water,” but all the Class 2AB waters within the Project Area are classified as “cold water” fisheries.

Class 3B waters are tributary waters, including adjacent wetlands that are not known to support fish populations or drinking water supplies, and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna, at some stage of their life cycles. In general, Class 3B waters are characterized by frequent linear wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Class 3B waters are protected for aquatic life other than fish, recreation, wildlife, agriculture, industry, and scenic value.

#### 3.1.4.2 Groundwater

Groundwater in the Project Area is part of the Upper Colorado River Basin aquifer system and is located in the Green River Structural Basin. In the Green River Basin, groundwater recharge occurs mainly by seepage from precipitation and streams; discharge occurs mainly by evaporation, seepage to streams and lakes, transpiration (by vegetation), and pumping from wells (Welder 1968).

In Sublette County, the hydrogeologic environment consists of the fractured exposed granite formations and granite gneiss of the Wind River Mountains, which feature poor soils and deep groundwater (Hamerlinck and Arneson 1998). The alluvial basins along the Green River contain mature or mixed soils, shallow groundwater, and terraces (Hamerlinck and Arneson 1998). Alluvial basins and groundwater are also associated with other streams in the vicinity of the Project Area, such as the New Fork River. In the Project Area, groundwater discharges as flows from springs at several locations.

Based on maps produced by the Wyoming Water Resources Center, University of Wyoming, and Wyoming State Geological Survey, depths to groundwater in the Project Area range from under 10 feet to 100 feet, with the majority of the Project Area exhibiting depths of 50 to 100 feet (Hamerlinck and Arneson 1998). Based on groundwater monitoring conducted in the wells in the PAPA, water levels in domestic wells exhibit depths of 0 to 112 feet; stock wells exhibit depths of 5 to 368 feet; and industrial wells exhibit depths of 0 to 695 feet (Cole 2008). The slope of the water table in unconfined aquifers, such as alluvium present along stream channels, generally follows the topography and the drainage pattern (Welder 1968). The Project Area is located close to the New Fork River, Green River, and Muddy Creek, so pockets of groundwater may be present in the unconsolidated alluvium at shallower depths than may occur in other parts of the county.

#### 3.1.4.3 Water Quality

Water from the Project Area drains into three sub-basins evaluated for water quality by the WDEQ: 1) Upper Green River Sub-basin, 2) New Fork Sub-basin, and 3) Big Sandy Sub-basin. Each sub-basin is discussed as a whole in the WDEQ assessment report with reference to particular streams within the Project Area. A summary of the WDEQ assessment (WDEQ 2008) in each sub-basin is provided below.

The Upper Green River Sub-basin includes all tributaries into the Green River above Fontenelle Dam, except the New Fork Sub-basin. The Project Area lies in the lower elevation areas of the sub-basin within fine-grained sedimentary rocks which are a natural source of fine sediment and total dissolved solids in surface waters. Primary land uses within this sub-basin include grazing, recreation, irrigated hay production, and oil and gas development. Water quality testing in the Upper Green River has shown that surface waters are supporting their aquatic life use. However, current use support concerns were noted in various parts of the basin regarding oil seeps and ponds associated with oil wells, physical degradation of the streams, and seasonal dewatering of streams including Middle Creek which limit aquatic life use.

The New Fork Sub-basin includes all tributaries to the New Fork River. The Project Area lies in the lower sub-basin which includes fine- to coarse-grained sedimentary rocks that are natural sources of fine sediment and total dissolved solids. Land uses include recreation, grazing, forestry, irrigated hay production, and oil and gas development. Extensive natural gas development has been occurring within the lower sub-basin and increased surface water and groundwater quality monitoring is being conducted by the SCCD. Chemical and biological monitoring has been conducted in the New Fork River within and near the Project Area since 2001 and all sites are in compliance with WDEQ's healthy conditions (Marshall 2008).

The Big Sandy Sub-basin includes the portion of the Project Area located in the Jonah Gulch, Long Draw, Big Sandy River-Bull Draw, Muddy Hole Draw, and Big Sandy River-Waterhole Draw watersheds. These watersheds drain to the Big Sandy River upstream of Big Sandy Reservoir. The WDEQ assessment discusses water quality in this sub-basin downstream of the Big Sandy Reservoir but does not discuss water quality in the upstream areas. Downstream of the Big Sandy Reservoir, WDEQ assessments indicate that aquatic life uses are being supported on the Big Sandy River, between the Green River and the confluence with Little Sandy Creek.

The Green River and its tributaries are subject to salinity control through the Colorado River Basin Salinity Control Program. The Colorado River Basin Salinity Control Forum is a cooperative effort between federal agencies and seven states to address the problem of increasing salinity in the lower reaches of the Colorado River. Although the Project Area is located in the upper reaches of the Colorado River Basin and there are relatively few salinity problems in Wyoming compared with the lower Colorado River Basin, it is often more economically feasible to reduce salinity in upstream reaches (WDEQ 2008). As a result, major salinity control measures to reduce irrigation-related salinity input to the Green River have been implemented in the Big Sandy watershed (primarily downstream of the Big Sandy Reservoir).

Groundwater quality is also regulated by WDEQ. Groundwaters of the state are classified by use and by ambient water quality. Waters that are known sources of supply and are appropriated for uses are classified by that use. Those uses include domestic, fish and aquatic life, agriculture, livestock, and industry. Unappropriated waters are classified by ambient water quality. Applicable groundwater quality standards depend on the classification of the groundwater. Groundwater in the Project Area is primarily classified for oil and gas use and livestock and wildlife watering; however, some groundwater within the Project Area is classified for domestic use. Ongoing groundwater investigations in the PAPA and the Jonah Gas Field have provided updated water quality data within the vicinity of the Project Area (SCCD 2007; Cole 2008; Marshall 2008).

## 3.2 BIOLOGICAL ENVIRONMENT

### 3.2.1 Vegetation

The Project Area is located within the Wyoming Basin ecoregion. This regional area is a broad basin nearly surrounded by mountain ecoregions. It is dominated by arid grasslands and shrublands and interrupted by high hills and low mountains. The region is somewhat drier than the northwestern Great Plains to the northeast and does not have the extensive cover of pinyon-juniper woodland found in the Colorado Plateau to the southwest. The Project Area can be further defined as the Rolling Sagebrush Steppe biome where big sagebrush (*Artemisia tridentata*), greasewood (*Sarcobatus* spp.), and saltbush (*Atriplex* spp.) are common components (Chapman et al. 2004). High elevations and low annual precipitation are prime determinants of plant species composition, abundance, and distribution within the Project Area. Much of the region is used for livestock grazing, although many areas lack sufficient vegetation to support this activity. The region contains major producing natural gas and petroleum fields.

Spatial vegetation data were provided by the PFO and RSFO and were used to determine the vegetation classifications that are found within the Project Area. The vegetation layer provided by the BLM indicated that the Project Area is dominated by the Wyoming big sagebrush (*A. t. wyomingensis*) vegetation community and represents approximately 69% of the Project Area. Other communities include desert shrub, agriculture, mixed grassland, forest-dominated riparian, greasewood, exposed rock/bare ground, shrub-dominated riparian, mountain big sagebrush, and human settlement. Most of the land cover types are represented within the Project Area with the exception of desert shrub and mountain big sagebrush. The vegetation communities represented in the Project Area are defined by the Wyoming Gap

Analysis Program land cover descriptions and are described in more detail below (Merrill et al. 1996).

#### 3.2.1.1 Wyoming Big Sagebrush

The Wyoming big sagebrush community type in the Project Area is characterized by a mosaic distribution of sagebrush stands ranging from moderate to high density. The thicker stands mainly occur east of the New Fork River, while stands of moderate density occur west of the New Fork River. The herbaceous vegetation component of the sagebrush stands east of the river is fairly dense and well distributed. In contrast, the stands west of the river lack a dense herbaceous understory.

Intermittent or ephemeral drainages within the stands throughout the Project Area are dominated by basin big sagebrush (*A. t. tridentata*). Shrub species that occur within the sagebrush community include rabbitbrush (*Ericameria* spp.), sand sagebrush (*A. filifolia*), winterfat (*Kraschenninikovia lanata*), Gardner's saltbush (*Atriplex gardneri*), and occasionally black greasewood (*Sarcobatus vermiculatus*). The understory is composed of various forbs and grasses. Common forbs include prickly pear cactus (*Opunita polyacantha*), granite prickly phlox (*Leptodactylon pungens*), Hood's phlox (*Phlox hoodsii*), and stemless goldenweed (*Haplopappus acaulis*). The grass component of the understory consists of Indian ricegrass (*Oryzopis hymenoides*), needle-and-thread grass (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda*), thickspike wheatgrass (*Elymus lanceolatus*), and western wheatgrass (*Pascopyrum smithii*).

#### 3.2.1.2 Agriculture/Irrigated Crops

This aggregated land cover type includes agricultural areas of irrigated row crops such as grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops. It also includes cultivated crops, which are areas used for the production of annual crops. Agricultural lands within the Project Area are found primarily in areas along North Piney Creek, Green River, and New Fork River.

#### 3.2.1.3 Mixed Grassland

Interspersed within the Wyoming big sagebrush community are areas of mixed grasslands. Grassland communities occur in lowland and upland areas and may occupy swales, mesa tops, and alluvial flats, but sites are typically xeric. The dominant perennial bunchgrasses and shrubs within this type are all very drought-resistant plants. Communities within this vegetation type may vary considerably by species composition; however, they are all dominated by perennial grasses. Common bunchgrasses in the Project Area include Indian ricegrass, needle-and-thread, squirreltail (*E. elymoides*), Sandberg bluegrass, and thickspike wheatgrass. Common forbs are Hood's phlox, buckwheat (*Eriogonum* spp.), scarlet globemallow (*Sphaeralcea coccinea*), stemless goldenweed, and pepperweed (*Lepidium* spp.).

#### 3.2.1.4 Forest-dominated Riparian

Forest-dominated riparian zones include areas where tree species dominate the vegetation of the riparian corridor. In Wyoming, the overstory tree species in this cover type are usually narrowleaf cottonwood (*Populus augustifolia*) and Russian olive (*Elaeagnus angustifolia*), but can also include aspen (*Populus tremuloides*), boxelder (*Acer negundo*), or a variety of

conifer species. Trees must occupy more than 25% of the vegetative cover within the riparian zone. The understory is frequently dominated by willows (*Salix* spp.) and herbaceous species including sedges (*Carex* spp.). In basins, larger drainages often support trees while smaller drainages support shrubs and grasses. Within the Project corridor, this cover type is found along the Green and New Fork rivers.

#### 3.2.1.5 Greasewood

This cover type is dominated by black greasewood and is characterized by areas where greasewood comprises more than 75% of the total shrub cover and where shrubs comprise more than 25% of the total vegetative cover. This cover type is often mixed with similar grass species found in mixed grasslands. Greasewood is found in the bottoms of dry washes and on steep slopes above drainages. Greasewood often exists in a zone outside the riparian influence of perennial streams, and in the Project Area, it exists along the edge of the floodplains along Muddy Creek and New Fork River.

#### 3.2.1.6 Rock/Bare Ground

This basin type includes naturally occurring areas of bare rock and soil such as cliffs, spires, rock outcrops, and talus fields, as well as steep scarps of soft rock with total vegetative cover less than 15%, located along the edges of floodplains, and scattered ridges in the Project Area.

#### 3.2.1.7 Shrub-dominated Riparian

This vegetation community consists of riparian zones where shrubs comprise more than 25% of the vegetative cover and where trees occupy less than 25% of the total vegetative cover. Willows are the most common shrub species within this cover type with an understory of sedges and rushes (*Juncus* spp.). Sagebrush and/or greasewood are also common in this community, but other shrubs, such as chokecherry (*Prunus virginiana*), birch (*Betula* spp.), alder (*Alnus* spp.), or tamarisk (*Tamarix* spp.), may be present or dominant in undisturbed floodplains and ephemeral drainages.

#### 3.2.1.8 Human Settlement

Human settlements include towns and cities occupying areas greater than 100 hectares. This type of land cover can also include residential areas on the outskirts of towns and cities. Human settlements within the Project Area are found along the edge of the floodplains of the Green River.

### 3.2.2 Wetlands, Floodplains, and Riparian

Wetlands, floodplains, and riparian areas within the Project Area are most typically adjacent to and associated with the perennial, intermittent, and ephemeral stream drainages. The New Fork River, Green River, Muddy Creek, and North Piney Creek are the only perennial streams that intersect the Project corridor. Other streams within the Project Area are intermittent or ephemeral drainages that primarily exhibit short-term surface flows in response to snowmelt run-off or precipitation events. The perennial streams that cross through the Project Area can be described as having relatively sinuous channels surrounded by wide floodplains supporting riparian and wetland communities. The intermittent Alkali Creek channel is also relatively sinuous with a narrow floodplain and deeply incised stream embankments. Other intermittent or ephemeral streams that cross the Project Area are relatively small and dry for most of the

year. Riparian wetlands surrounding Alkali Creek are limited and not well-defined due to a less frequent and shorter duration of hydroperiod. Ephemeral streams typically do not support wetlands and riparian habitats due to the lack of continual soil saturation and less frequent influx of surface waters.

Riparian and wetland communities represent the transitional zone between aquatic and terrestrial ecosystems and are dependent on periodic hydrological influxes. They are often associated with perennial and intermittent streams and occur around springs and seeps. These communities are highly productive providing important resources for wildlife and livestock. Supporting lush vegetation, soils in these riparian and wetland areas are usually deep loams with a high percentage of organic matter. Wetland and riparian areas serve a wide variety of purposes including aquifer recharge, flood attenuation, flow moderation, water filtration, wildlife and stock forage, and stream bank stabilization.

The U.S. Fish and Wildlife Service's (USFWS's) National Wetlands Inventory (NWI) program identified large areas of wetlands primarily associated with the floodplains of North Piney Creek, Muddy Creek, Green River, and New Fork River (USFWS 2008a). Other small wetlands that are mapped by NWI are scarce, dispersed, and small, but occur throughout the Project Area. Plant species and associations found in wetlands depend on the hydrology. Wetlands in the Project Area are typically characterized by herbaceous vegetation including rushes, sedges, bluegrass species, and other facultative and obligate wetland grasses. Shrub and tree strata in wetland and riparian corridors are dominated by willows, alder, and cottonwood, particularly in the Green River and New Fork River floodplains.

The NWI database shows the Project Area to contain six wetland types as defined by the Cowardin et al. (1979) wetland classification system (USFWS 2008a). The wetland types listed in the NWI database include palustrine, emergent, temporarily flooded; palustrine, scrub-shrub, temporarily flooded; palustrine, scrub-shrub/emergent, temporarily flooded; palustrine, emergent, seasonally flooded; palustrine, aquatic bed, semipermanently flooded, excavated; and palustrine, unconsolidated shore, seasonally flooded. Although it provides a good source to identify areas that potentially have wetlands, NWI data are very coarse and wetland perimeters and locations may be inaccurate. Also, some wetlands may not be mapped yet in the NWI which makes its use uncertain. Field visits indicate that mapped wetland locations are present along Muddy Creek and the Green and New Fork rivers. Preliminary wetland surveys were conducted by GeoEngineers staff in October 2008 and comprehensive wetland delineations would be completed prior to Project initiation in the spring of 2009.

### 3.2.3 Special Status Species

#### 3.2.3.1 Federally Listed Animal Species

The Endangered Species Act (ESA)-listed animal species for Sublette County (USFWS 2008b) were reviewed to determine their status in the Project Area (Table 3-3). No federally listed species are known to occur in the Project Area, but those that potentially occur due to presence of suitable habitat are discussed below. Canada lynx (*Lynx canadensis*) and Kendall Warm Springs dace (*Rhinichthys osculus thermalis*) are not expected to occur in the Project Area due to the lack of suitable habitat. Whooping crane (*Grus americana*), piping plover (*Charadrius melodus*), interior least tern (*Sternula antillarum*), and pallid sturgeon

(*Scaphirhynchus albus*) are found in the Platte River system, which is not connected to the Project Area. These species would not be affected by the Proposed Action and are not analyzed further. Endangered Colorado River fishes do not occur in the Project Area; however, they do occur downstream and therefore would be subject to potential effects from actions in the Project Area. There is no designated critical habitat present in the Project Area.

**Table 3-3. Sublette County Federally Listed Animal Species.**

| Common Name | Scientific Name | Status | Status in Project Area |
|---|---|---|---|
| **Mammals** | | | |
| Black-footed ferret | *Mustela nigripes* | Endangered | Within historic range. Potential habitat in prairie dog towns. Not expected to occur. |
| Canada lynx | *Lynx canadensis* | Threatened | Not present. Lack of suitable habitat. |
| Gray wolf | *Canis lupus* | Nonessential Experimental Population | Not known to occur in the Project Area. Potentially suitable habitat present. Unlikely to occur. |
| **Birds** | | | |
| Whooping crane | *Grus americana* | Endangered | Not present. Lack of suitable habitat. |
| Piping plover | *Charadrius melodus* | Threatened | Not present. Lack of suitable habitat. |
| Interior least tern | *Sternula antillarum* | Endangered | Not present. Lack of suitable habitat. |
| Yellow-billed cuckoo | *Coccyzus americanus* | Candidate | Not known to occur in the Project Area. Potentially suitable habitat near New Fork and Green rivers. |
| **Fish** | | | |
| Kendall Warm Springs dace | *Rhinichthys osculus thermalis* | Endangered | Not present. Only occurs in Kendall Warm Springs. |
| Pallid sturgeon | *Scaphirhynchus albus* | Endangered | Not present. Lack of suitable habitat. |
| Colorado pikeminnow | *Ptychocheilus lucius* | Endangered | Not present. Lack of suitable habitat. Occurs downstream. |
| Bonytail | *Gila elegans* | Endangered | Not present. Lack of suitable habitat. Occurs downstream. |
| Humpback chub | *Gila cypha* | Endangered | Not present. Lack of suitable habitat. Occurs downstream. |
| Razorback sucker | *Xyrauchen texanus* | Endangered | Not present. Lack of suitable habitat. Occurs downstream. |

Source: USFWS 2008b

*Black-footed Ferret*

The black-footed ferret (*Mustela nigripes*) (BFF) is listed as endangered by the USFWS, with non-essential experimental status given to reintroduced populations (USFWS 2008b). BFF are obligate predators of prairie dogs (*Cynomys* spp.). The species is largely extirpated from the

wild primarily due to range-wide decimation of the prairie dog ecosystem (Kotliar et al. 1999). BFF are inhabitants of large prairie dog complexes, which are composed of several smaller colonies located in close proximity to one another and providing a sustainable prey base. The species is nocturnal and digs and burrows into prairie dog tunnels to prey on animals while underground in their dens.

The Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act (USFWS 1989) states that BFF require white-tailed prairie dog (*Cynomys leucurus*) towns or complexes greater than 200 acres in size, and towns of this dimension may be important for BFF recovery. Prairie dog colonies in the Project Area may be large enough to support BFFs. Specifically, several prairie dog colonies in the vicinity of the New Fork River are large and close to one another, providing conditions that may be suitable for BFF. The BFF was known to exist in the Project Area historically, but individuals have not been recorded in recent surveys and are likely extirpated from the area. The USFWS (2004) recommends BFF surveys within the Big Piney Prairie Dog Complex (T29–31N, R109–111W) that overlaps a portion of the Project Area. The remainder of the Project Area has been block cleared for further need to conduct BFF surveys. SWCA biologists conducted standardized surveys in the Big Piney Prairie Dog Complex in October 2008; no BFFs were detected.

*Gray Wolf*

Gray wolves (*Canis lupus*) were reintroduced into the Greater Yellowstone Area in 1995-1996 and wolves in Wyoming are part of a designated nonessential experimental population. This species was delisted from the ESA in February 2008 (73 Federal Register [FR] 10514); however, in July 2008 the legal defensibility of the delisting was challenged and the courts found that the USFWS inappropriately delisted the gray wolf (73 FR 63926). As a result, the court reinstated ESA protections for gray wolves in the northern Rocky Mountains. The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub. Their primary prey resource is elk, which typically avoid open habitats in the Project Area preferring to stay within forested areas of the Wyoming and Wind River ranges and near WGFD feedgrounds. Wolves may predate other big game species found in the Project Area, but the high level of existing development and human activity likely preclude wolves from hunting in the Project Area. In Wyoming, this species is primarily known to occur in the Greater Yellowstone Ecosystem, though it does occur outside this ecosystem in Sublette County. There are three monitored packs within the PFO management area but their ranges are outside of the Project Area. The Black Butte pack uses the Upper Green River, the Daniel pack uses the Wyoming Range, and the Prospect pack occurs near the Town of Farson (BLM 2007a; Jimenez et al. 2008). The Big Piney, La Barge, and Soda Lake packs are also nearby (Jimenez et al. 2008). Wolves from the Big Piney pack were observed just northwest of Segment 1 in 2003 (Wyoming Natural Diversity Database [WYNDD] 2007). There have been no observations in the Project Area, but wolves from these packs may occasionally pass through.

*Western Yellow-billed Cuckoo*

For listing purposes, the USFWS designated yellow-billed cuckoos (*Coccyzus americanus*) in the western United States as a Distinct Population Segment (DPS) (USFWS 2007). In Wyoming, the western DPS corresponds to that portion of the state west of the Continental Divide and the western and southern boundaries of the Great Divide Basin. The western

yellow-billed cuckoo occurs in relatively large, unfragmented stands of riparian habitat that are dominated by cottonwoods with a well-developed understory and occur below approximately 7,000 feet elevation (WYNDD 2008). The western yellow-billed cuckoo has potential to occur within the Project Area in riparian woodland along the New Fork and Green rivers. This species has been documented in the PFO, and specifically along the Green River at Seedskadee National Wildlife Refuge, but no known nest sites have been recorded.

*Colorado River Fish Species*

The Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*G. elegans*) are listed as endangered by the USFWS. They are endemic fish species that once thrived in the Colorado River system. Dam installation and the introduction of non-native fish changed the river environment and put these species at risk (USFWS 2006). Endangered Colorado River fish are not known to occur in the New Fork River within the Project Area, but do occur downstream. These fish are listed for Sublette County because water depletions and effects to water quality in the Colorado River, Little Snake River, and Green River systems may affect the species and/or their designated critical habitat in downstream reaches in other states (USFWS 2008b).

#### 3.2.3.2 BLM Sensitive Animal Species

In addition to federally listed species, the BLM Wyoming State Office has established a list of sensitive species that warrant special attention on BLM-administered lands (BLM 2002b) and the PFO has updated their sensitive species list in the current RMP (BLM 2008a). BLM sensitive species are species that could become endangered or extirpated in the state. BLM sensitive animal species known to occur in the PFO and RSFO were reviewed to determine potential presence in the Project Area (Table 3-4). Species known to occur or with potential habitat in the Project Area are discussed below.

**Table 3-4. BLM Sensitive Species Listed for the PFO and RSFO.**

| Common Name | Scientific Name | RSFO | PFO | Habitat | Potential for Occurrence in Project Area |
|---|---|---|---|---|---|
| **Mammals** | | | | | |
| Townsend's big-eared bat | *Corynorhinus townsendii* | X | | Forests, basin-prairie shrub, caves and mines | Yes |
| Spotted bat | *Euderma maculatum* | X | | Cliffs over perennial water, basin-prairie shrub | Yes |
| Long-eared myotis | *Myotis evotis* | X | X | Conifer forest, cottonwood riparian, caves and mines | Yes |
| Fringed myotis | *Myotis thysanodes* | X | | Conifer forests, woodland-chaparral, caves and mines | Yes |
| Pygmy rabbit | *Brachylagus idahoensis* | X | X | Dense sagebrush with sandy soils | Yes |
| White-tailed prairie dog | *Cynomys leucurus* | X | X | Basin-prairie shrub, grasslands | Yes |
| Wyoming pocket gopher | *Thomomys clusius* | X | | Meadows with loose soil | No – outside of known range |

| Common Name | Scientific Name | RSFO | PFO | Habitat | Potential for Occurrence in Project Area |
|---|---|---|---|---|---|
| Idaho pocket gopher | *Thomomys idahoensis* | X | X | Subalpine mountain meadows, shrub steppes, and various grasslands, with rocky, shallow soils. | No |
| Swift fox | *Vulpes velox* | X | | Grasslands | No – outside of known range |
| Grizzly bear | *Ursus arctos horribilis* | | X | Forests and mountain woodlands and meadows | No – lack of suitable habitat |
| **Birds** | | | | | |
| Trumpeter swan | *Cygnus buccinator* | X | X | Lakes, ponds, rivers with aquatic vegetation | Yes |
| White-faced ibis | *Plegadis chihi* | X | X | Marshes, wet meadows | Yes |
| Northern goshawk | *Accipiter gentilis* | X | X | Old-growth conifer and deciduous forests | Yes |
| Ferruginous hawk | *Buteo regalis* | X | X | Basin-prairie shrub, grassland, rock outcrops | Yes |
| Bald eagle | *Haliaeetus leucocephalus* | X | X | Large trees near a water source | Yes |
| Peregrine falcon | *Falco peregrinus* | X | X | Tall cliffs for nesting | Yes |
| Greater sage-grouse | *Centrocercus urophasianus* | X | X | Sagebrush | Breeding – Yes<br>Winter – Yes |
| Mountain plover | *Charadrius montanus* | X | X | Areas of flat topography and vegetation < 6 inches | Yes |
| Long-billed curlew | *Numenius americanus* | X | X | Grasslands, plains, foothills, wet meadows | Yes |
| Burrowing owl | *Athene cunicularia* | X | X | Prairie dog colonies, grasslands, basin-prairie shrub | Yes |
| Loggerhead shrike | *Lanius ludovicianus* | X | X | Sagebrush | Yes |
| Sage thrasher | *Oreoscoptes montanus* | X | X | Sagebrush | Yes |
| Brewer's sparrow | *Spizella breweri* | X | X | Sagebrush | Yes |
| Sage sparrow | *Amphispiza belli* | X | X | Sagebrush | Yes |
| **Fish** | | | | | |
| Bluehead sucker | *Catostomus discobolus* | X | X | Bear, Snake, and Green drainages, all waters | Yes |
| Flannelmouth sucker | *Catostomus latipinnis* | X | X | Colorado River drainage, large rivers, streams and lakes | Yes |
| Leatherside chub | *Snyderichthys copei* | X | X | Bear, Snake, and Green drainages, clear, cool streams and pools | No – outside of known range; no water depletion |
| Roundtail chub | *Gila robusta* | X | X | CO River drainage, mostly large rivers, also streams and lakes | No – outside of known range; no water depletion |

| Common Name | Scientific Name | RSFO | PFO | Habitat | Potential for Occurrence in Project Area |
|---|---|---|---|---|---|
| Yellowstone cutthroat trout | *Oncorhynchus clarkii bouvieri* | | X | Yellowstone drainage, small mountain streams, large rivers | No – outside of known range; no water depletion |
| Colorado River cutthroat trout | *Oncorhynchus clarkii pleuriticus* | X | X | CO River drainage, clear mountain streams | Yes |
| Fine-spotted Snake River cutthroat trout | *Oncorhynchus clarkia ssp.* | | X | Snake River drainage | No – outside of drainage system |
| **Reptiles** | | | | | |
| Midget faded rattlesnake | *Crotalus viridis concolor* | X | | Rock outcrops near Flaming Gorge Reservoir below 7,000 feet elevation | No – outside of known range |
| **Amphibians** | | | | | |
| Boreal toad | *Bufo boreas boreas* | X | X | Pond margins, wet meadows, riparian areas | No – outside of known range |
| Northern leopard frog | *Rana pipiens* | X | X | Beaver ponds, permanent water in plains and foothills | Yes |
| Spotted frog | *Rana luteiventris* | X | X | Ponds, sloughs, small streams | No – outside of known range |
| Great Basin spadefoot toad | *Spea intermontana* | X | | Spring seeps, permanent and temporary waters | No – outside of known range |

*Bat Species*

The four BLM-listed bat species (Townsend's big-eared bat [*Corynorhinus townsendii*], spotted bat [*Euderma maculatum*], long-eared myotis [*Myotis evotis*], and fringed myotis [*M. thysanodes*]) have the potential to occur within the Project Area. The presence of these species is expected only during nocturnal foraging bouts and migratory movements. Spotted bat and fringed myotis are not known for the latilongs (one degree latitude by one degree longitude) encompassing the Project Area, while long-eared myotis and Townsend's big-eared bat have been recorded (WGFD 2004).

Sites, such as caves and abandoned mines, critical to these species for maternity colonies, hibernacula, and similar concentrations, are not present within the Project Area or immediate vicinity. Cottonwood forests suitable to long-eared myotis may occur along the Green and New Fork rivers near the Project Area, although this habitat is limited. Potential for occurrence within the Project Area is expected to be very low for all BLM-listed bat species and they are precluded from further impact analysis.

*Pygmy Rabbit*

The pygmy rabbit (*Brachylagus idahoensis*) is a BLM sensitive species that has recently been petitioned for federal listing. In January 2008, the USFWS published a 90-day finding, initiating a status review to determine if listing the pygmy rabbit is warranted (73 FR 1312). The pygmy rabbit is typically found in dense stands of big sagebrush growing in deep, loose soils. Pygmy rabbits have the potential to occur in dense sagebrush within the Project Area.

Pygmy rabbits have been recorded recently near the Project Area in the Jonah Infill Drilling Project Area (JIDPA) and PAPA.

In 2008, GeoEngineers conducted a pedestrian survey of the 150-foot-wide ROWs for pygmy rabbits and their habitat. Locations were searched for active burrows, pellets, and individuals found in the field. Occupied habitat was delineated and mapped in the field within and adjacent to the ROWs.

*White-tailed Prairie Dog*

The range of the white-tailed prairie dog (*Cynomys leucurus*) occurs across the western United States including central and southern Wyoming. White-tailed prairie dogs are generally found in Wyoming at elevations ranging between 5,000 and 10,000 feet in desert and shrub grasslands. Like other prairie dog species, white-tailed prairie dog populations have been declining as suitable habitat is disturbed or developed, whole colonies are lost to sylvatic plague, and individuals are shot and poisoned. Prairie dog towns, or colonies, offer important benefits to short-grass ecosystems such as increasing water absorption and nutrient concentrations. Other sensitive species, like the burrowing owl and BFF, rely on prairie dog towns. The greater the size of the colony and close proximity to other active prairie dog colonies, the greater the suitability of the prairie dog prey-base for active predators such as raptors, badgers, or BFF.

Prairie dog towns were mapped for a large portion of the Project Area in 2008 (Thomas 2008). In 2007 and 2008, SWCA visited known prairie dog towns previously mapped by the PFO in the Project Area to confirm the presence of any active prairie dog towns and to update the status of towns no longer active. This reconnaissance survey did not update the size or boundaries of towns outside of the Project ROW.

*Idaho Pocket Gopher*

The Idaho pocket gopher (*Thomomys idahoensis*) was only recently described as a species separate from the northern pocket gopher (*Thomomys talpoides*). The Idaho pocket gopher inhabits shrubsteppe, grasslands, and subalpine mountain meadows, but favors shallow, rocky soils (in contrast to the northern pocket gopher, which prefers deeper, less rocky soils) in sagebrush, sage-grasslands, and mountain meadows. Idaho pocket gophers have not been recorded in the Project Area.

*Trumpeter Swan*

The upper Green River Basin supports a small breeding population of trumpeter swans (*Cygnus buccinator*) (Cerovski 2007). Swans from this population, as well as migrants and wintering birds from outside populations, likely use the Green and New Fork rivers year-round as long as open water is available. Trumpeter swans require protected, shallow ponds and lakes with islands for nesting. These requirements are not met by any wetland site in the Project Area, so occurrence of this species is expected to be limited to foraging birds within the river corridor or migrants passing through the area.

*White-faced Ibis*

Appropriate nesting habitat of large, deep wetlands with tall, emergent vegetation is not found within the Project Area. The white-faced ibis (*Plegadis chihi*) is a regular migrant throughout

the state, however, and small numbers are expected to occur around wetlands and along the Green and New Fork river corridors during spring and fall migration.

*Northern Goshawk*

Northern goshawk (*Accipiter gentilis*) breeding habitat in Wyoming typically consists of old-growth and mature montane coniferous forest. The species does wander widely to low-elevation sites during winter months and may pass through the Project Area during migration. The potential presence of this species in the Project Area is very low and it is precluded from further impact analysis.

*Ferruginous Hawk*

The ferruginous hawk (*Buteo regalis*) inhabits grasslands and semidesert shrublands, nesting in isolated trees, on rock outcrops, on structures such as power poles, or on the ground. Potential habitat occurs in the Project Area in these habitats, particularly near prairie dog towns. Ferruginous hawks have been recorded recently near the Project Area in the JIDPA and PAPA; however, comprehensive surveys have not been conducted within the Project Area.

In 2006 and 2007, SWCA conducted preliminary surveys in portions of the Project Area. During these surveys, ferruginous hawks were confirmed in the Project vicinity and both active and inactive nests were observed. The majority of the nests and highest quality nesting habitat for ferruginous hawks were discovered on bluff outcroppings along Yellow Point Ridge near the Jonah Gas Field, and along the bluffs just north of North Alkali Draw. One ferruginous hawk nest is located near the New Fork River within a mile of the proposed and alternative Paradise substation locations.

*Bald Eagle*

The bald eagle (*Haliaeetus leucocephalus*) was recently removed from the USFWS list of threatened and endangered species but is considered a BLM sensitive species. Bald eagle is protected under the Bald and Golden Eagle Protection Act of 1940. The bald eagle feeds on fish and carrion and typically roosts in large trees near a water source. Two bald eagle nests are found along the New Fork River within the Project Area. Also, wintering bald eagles roost in and adjacent to the proposed Project Area (SWCA 2008). Additional surveys for the Project Area will be conducted in the winter of 2008/2009 for both the New Fork and Green rivers.

*Peregrine Falcon*

Similar to northern goshawk, breeding sites for the peregrine falcon (*Falco peregrinus*) are limited to montane regions of Wyoming. Foraging bouts and migration do occur at lower elevations and the species may be present in the Project Area during those events. The species may be most likely to occur along the Green and New Fork rivers where waterfowl and shorebird concentrations provide prey opportunities.

*Greater Sage-Grouse*

In February 2008, USFWS opened a 90-day public comment period to allow all interested parties an opportunity to provide information regarding the status of the greater sage-grouse (*Centrocercus urophaseanus*) (73 FR 10218). The new status review will take into

consideration relevant new information that has become available since the 2005 finding that the greater sage-grouse did not require protection under the ESA. The USFWS will evaluate all new information and make one of three possible decisions regarding listing the species throughout all or a significant portion of its range: 1) listing is not warranted, 2) listing is warranted, 3) or listing is warranted, but precluded.

The Project Area contains suitable greater sage-grouse habitat for breeding, nesting, and brood-rearing. The sage-grouse depends almost exclusively on healthy sagebrush, with an understory of grasses and forbs, for year-round survival. Braun et al. (1977) indicated that most hens nest within 2 miles of a lek, but more recent studies suggest many hens nest farther away and distance may increase in disturbed areas (Connelly et al. 2004). Some studies suggest that nest success increases with increased sagebrush cover (Connelly et al. 2004). Winter habitats of sage-grouse are dominated by sagebrush, which provides shelter and food. Shrub density and height can influence habitat selection by sage-grouse in the winter (Connelly et al. 2004).

According to WGFD annual monitoring data, several occupied leks are present within the Project Area, including leks within the Yellowpoint Complex (WGFD 2005, 2008). A complex is a group of leks in close proximity between which male sage-grouse may interchange from one day to the next. Five of the leks in the Yellowpoint Complex were given special consideration in the Pinedale Anticline Final Supplemental Environmental Impact Statement (BLM 2008b).

In 2008, the Wyoming governor issued EO 2008-2 which identified core areas that are critical to maintaining sage-grouse breeding populations in the state. The Daniel and South Pass core areas are within the Project Area.

Suitable nesting and winter habitats have not been mapped within the Project Area. Therefore, for this EA, potential sage-grouse habitat is considered occupied leks with a surrounding 2-mile buffer. Not all areas within this buffer may be suitable, although suitable habitat could extend beyond this buffer. While conducting preliminary field surveys, SWCA biologists observed that the majority of the Project Area is dominated by large stands of sagebrush of varying size and growth stage. Many of these stands are suitable for sage-grouse breeding and wintering habitat.

*Mountain Plover*

In western Wyoming, mountain plover (*Charadrius montanus*) habitat generally overlaps with that of prairie dogs and consists of shortgrass prairie or sparsely vegetated areas within shrubsteppe. Since there is prairie dog habitat in the Project Area, mountain plover has the potential to occur in the area. Mountain plovers have been recorded recently near the Project Area in the JIDPA and PAPA.

*Long-billed Curlew*

The upper Green River Basin from Merna to Pinedale along the Horse Creek and New Fork rivers supports one of the largest breeding populations of long-billed curlews (*Numenius americanus*) in Wyoming (Dark-Smiley and Keinath 2004; Cerovski 2007). Nesting may occur in or near the Project Area where level, upland areas with low herbaceous vegetation

(under 30 centimeters) provides suitable breeding habitat. Migrants and foraging curlews may occur around shallow wetlands, as well as upland grasslands.

*Burrowing Owl*

Burrowing owls (*Athene cunicularia*) use a wide variety of arid and semiarid environments, with well-drained, level to gently sloping areas characterized by sparse vegetation and bare ground. The species prefers open prairie, grassland, desert, and shrubsteppe habitats, and may also inhabit agricultural areas (WGFD 2005). In Wyoming, the species almost exclusively associates itself with prairie dog colonies and uses the burrows for nesting. Potential nesting habitat for burrowing owls exists within prairie dog towns in the Project Area. Burrowing owls have been recorded recently near the Project Area in the JIDPA and PAPA; however, surveys for this species have not been conducted within the entire Project Area.

*Loggerhead Shrike*

The loggerhead shrike (*Lanius ludovicianus*) has been recorded throughout Wyoming (Keinath and Schneider 2005). For nesting, presence of dense shrubs or trees with open herbaceous areas for foraging nearby seems to be important. Loggerhead shrikes have been known to inhabit fencerows between pastures, old orchards, mowed roadsides, cemeteries, and other human-influenced areas, but are not likely to nest in such areas (Keinath and Schneider 2005). Loggerhead shrikes have been recorded recently near the Project Area in the JIDPA. Based upon habitat in the Project Area, this species is expected to occur.

*Sage Thrasher*

The breeding distribution of the sage thrasher (*Oreoscoptes montanus*) includes shrub-steppe communities dominated by big sagebrush between 4,200 and 6,700 feet elevation, and was mapped as occurring in southwestern Wyoming (Buseck et al. 2004). Sage thrashers typically place their nests within or under mature shrubs with good basal cover and may occur in these areas within the Project Area. Sage thrashers have been recorded recently near the Project Area in the JIDPA and PAPA. Based upon habitat in the Project Area, this species is expected to occur.

*Brewer's Sparrow*

Surveys have shown large populations of Brewer's sparrows (*Spizella breweri*) occur in southwestern Wyoming, primarily where dense sagebrush stands have an average canopy height of less than 5 feet (Hansley and Beauvais 2004a). Nests are often placed in the largest shrubs in the densest stands of a large patch size. This habitat is available within the Project Area. Brewer's sparrows have been recorded recently near the Project Area in the JIDPA and PAPA. Based upon habitat in the Project Area, this species is expected to occur.

*Sage Sparrow*

Known breeding distribution of the sage sparrow (*Amphispiza belli*) was mapped in southwestern Wyoming, with the highest densities occurring in Sweetwater County (Hansley and Beauvais 2004b). This songbird occurs in sagebrush habitats that are at least 30 acres in extent. Sage sparrows have been recorded recently in the JIDPA and PAPA. Suitable habitat for sage sparrows may exist in portions of the Project Area and the species is expected to occur.

*Bluehead Sucker*
Bluehead suckers (*Catostomus discobolus*) are known to occur in the upper Green River and its tributaries within the PFO management area (BLM 2007a). Bluehead suckers are found in mainstem streams and small to mid-size tributaries of the Upper Colorado River Basin which have high turbidity and alkalinity, a variety of flow regimes, and with water temperatures as high as 82 °F. This species is known to occur within the Project Area in the Green River above its confluence with the New Fork River.

*Flannelmouth Sucker*
The flannelmouth sucker (*Catostomus latipinnis*) is native to the entire Colorado River Basin, including the Green, Yampa, Gunnison, San Juan, Little Colorado, and Colorado rivers. Although preferring deep rivers, they occasionally can be found in smaller streams and lakes. They are found in the Green River in the PFO management area (BLM 2007a). Flannelmouth suckers are known to occur within the Project Area in the Green River above the confluence with the New Fork River. Hybrid flannelmouths have been observed in lower Muddy Creek (H. Sexauer, WGFD, pers. comm. with L. Burckhardt, SWCA).

*Colorado River Cutthroat Trout*
In Wyoming, the Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*) can be found in the Green River, Black's Fork, and Little Snake River drainages (WGFD 2005). This species prefers cold, clear water, a relatively steep gradient, and a rubble-boulder substrate. Colorado River cutthroat trout populations occur within the Project Area (BLM 2007a) and Conservation Populations occur within the PFO management area (Hirsch et al. 2006).

*Northern Leopard Frog*
Northern leopard frogs (*Rana pipiens*) have a widespread distribution in Wyoming where they inhabit permanent water sources up to 9,000 feet elevation. For the Project Area, the species is most likely to occur within the riparian corridors of the Green and New Fork rivers.

#### 3.2.3.3 Federally Listed and BLM Sensitive Plant Species

An inventory of federally listed and BLM sensitive plant species in the PFO and RSFO was compiled for this analysis. Two federally listed species and 16 BLM sensitive species are listed as having the potential to be present within the PFO, RSFO, or both (Table 3-5). However, after review of species' distributions and habitat availability within the Project Area, only seven of these plants have potential ranges or required habitat characteristics that extend into the proposed Project ROW. Locations of sensitive plant populations in the proposed Project vicinity were obtained from the RSFO and WYNDD.

Two federally listed species on this list are the threatened Ute ladies'-tresses (*Spiranthes diluvialis*) and the endangered blowout penstemon (*Penstemon haydenii*). Neither of these species are expected to occur within or near the Project Area. Although some suitable habitat for Ute ladies'-tresses may occur in riparian areas, no records exist in Sublette County and the Project Area is outside of the known range of this species (WYNDD 2008). The only known populations of blowout penstemon for Wyoming are in Carbon County (Heidel and Fertig 2008) and no suitable habitat exists within the Project Area.

**Table 3-5. Federally Listed and BLM Sensitive Plant Species Listed for the PFO and RSFO.**

| Common Name | Scientific Name | RSFO | PFO | Status[1] | Habitat | Potential Habitat |
|---|---|---|---|---|---|---|
| Meadow Pussytoes | *Antennaria arcuata* | X | X | S | Moist meadows, seeps, or springs surrounded by sage/grassland; 4,900-7,900 feet | Yes |
| Small rockcress | *Arabis pusilla* | X | | S | Cracks/crevices in sparsely vegetated granite/pegmatite outcrops within sage/grasslands; 8,000-8,100 feet | No |
| Mystery wormwood | *Artemisia biennis* var. *diffusa* | X | | S | Clay flats, playas; 6,500 feet | No |
| Nelson's milkvetch | *Astragalus nelsonianus* | X | | S | Clay flats, shale bluffs and gullies, pebbly slopes in sparsely vegetated sagebrush, juniper; 5,200-7,600 feet | No |
| Precocious milkvetch | *Astragalus proimanthus* | X | | S | Shale slopes with rocky, clay soils; 6,800-7,200 feet | No |
| Trelease's milkvetch | *Astragalus racemosus* var. *treleasei* | | X | S | Shale or barren clay slopes, sparsely vegetated sage; 6,500-8,200 feet | Yes |
| Cedar Rim thistle | *Cirsium aridum* | X | X | S | Barren, gravelly slopes, sandy-shaley draws; 6,700-7,200 feet | Yes |
| Ownbey's thistle | *Cirsium ownbeyi* | X | | S | Shale slopes, sparsely vegetated sage, juniper; 6,400-8,400 feet | No |
| Wyoming tansymustard | *Descurainia torulosa* | X | | S | Sparsely vegetated sandy slopes at base of cliffs of volcanic breccia, sandstone; 8,300-10,000 feet | No |
| Large-fruited bladderpod | *Lesquerella macrocarpa* | X | X | S | Gypsum-clay or barren hills, clay flats; 7,200-7,700 feet | Yes |
| Stemless beardtongue | *Penstemon acaulis* var. *acaulis* | X | | S | Semi-barren rocky ridges, knolls, and slopes; 5,900-8,200 feet | No |

| Common Name | Scientific Name | RSFO | PFO | Status[1] | Habitat | Potential Habitat |
|---|---|---|---|---|---|---|
| Blowout penstemon | *Penstemon haydenii* | | X | E | Sand dunes and sparsely vegetated, sand with crater-like blowout depressions created by wind erosion; 5,860-7,440 feet | No |
| Beaver Rim phlox | *Phlox pungens* | X | X | S | Sparsely vegetated slopes; 6,000-7,000 feet | Yes |
| Tufted twinpod | *Physaria condensata* | X | X | S | Sparsely vegetated shale slopes, ridges; 6,500-7,000 feet | Yes |
| Ute ladies'-tresses | *Spiranthes diluvialis* | X | X | T | Moist stream banks, wet meadows, abandoned stream channels; 4,500-6,800 feet | Yes |
| Green River greenthread | *Thelesperma caespitosum* | X | | S | Shale slopes and ridges; 6,300 feet | No |
| Uinta greenthread | *Thelesperma pubescens* | X | | S | Sparsely vegetated benches, ridges; coarse, cobbly Bishop Conglomerate soils; 8,200-8,900 feet | No |
| Cedar Mountain Easter daisy | *Townsendia microcephala* | X | | S | Rocky slopes of Bishop Conglomerate; 8,500 feet | No |

[1] S = BLM Sensitive; T = USFWS Threatened; E = USFWS Endangered

Based on habitat preferences and known geographic locations, the majority of BLM sensitive plant species have little or no potential for occurring in the Project Area or vicinity. Some potentially suitable habitat occurs within the Project Area for the following species that have ranges extending into the Project vicinity: meadow pussytoes (*Antennaria arcuata*), Trelease's milkvetch (*Astragalus racemosus* var. *treleasei*), Cedar Rim thistle (*Cirsium aridum*), large-fruited bladderpod (*Lesquerella macrocarpa*), Beaver Rim phlox (*Phlox pungens*), and tufted twinpod (*Physaria condensata*) (WYNDD 2008).

Meadow pussytoes have potential to occur in riparian habitat along the New Fork River, although there are no known populations in the vicinity of the Project Area. A population of Cedar Rim thistle is mapped southwest of the Jonah Gas Gathering Area. Two known populations of Beaver Rim phlox occur. One of the populations of Beaver Rim phlox is southwest of Segment 2, while the other population exists near Big Piney. This occurrence is within 0.1 mile of the Project Area. Other occurrences of Cedar Rim thistle, large-fruited bladderpod, and Beaver Rim phlox occur nearby on the bluffs along Yellow Point Ridge near the Jonah Gas Field and in scattered occurrences south of the New Fork River. Other sensitive plant species that have the potential to occur within the Project Area include Trelease's milkvetch and tufted twinpod.

### 3.2.4 Wildlife and Fisheries Resources

The Project Area includes upland and riparian habitats used by wildlife. The Wyoming Game and Fish Commission (1998) defined important wildlife habitats as "irreplaceable," "vital," or "high value." Habitats relevant to this EA include those defined as "vital," such as crucial winter ranges, and "high value" including parturition and winter/year-long ranges and Class 2 streams.

#### 3.2.4.1 Big Game Species

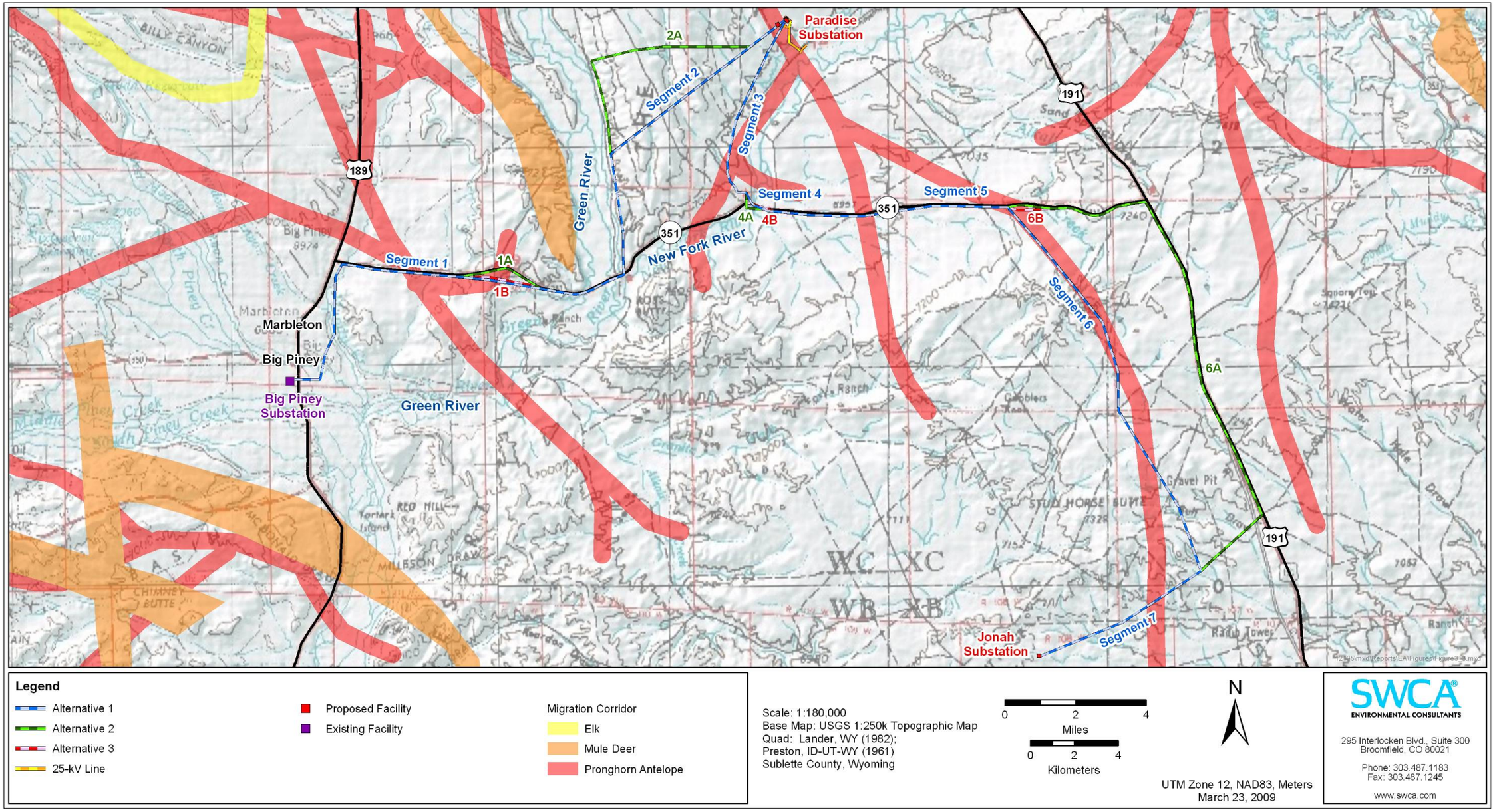
Perennial riparian corridors of the Green and New Fork rivers and upland shrubsteppe within the Project Area provides habitat for pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and moose (*Alces alces*). Crucial range is defined in the Pinedale RMP as those areas available and relatively intact, and that winter most of the population at its objective in adequate body condition, 8 or more years out of 10 (BLM 2008a). Spring/summer/fall range is used outside of persisting winter conditions. Winter range is used by substantial numbers of animals only during the winter period defined as November 15 through April 30. Winter/year-long range is occupied throughout the year but during winter it is used by additional animals that migrate from other seasonal ranges.

The Project Area is within vital seasonal use areas for moose, pronghorn, and mule deer. Important crucial winter/year-long (CWYL) habitat for moose and pronghorn occurs in the Project Area, as does crucial winter range for mule deer, primarily in the northwestern portion near the Green and New Fork rivers. Important pronghorn migration corridors occur in the Project Area and a major mule deer migration route is located north of the Project Area (Map 3-1). No parturition range for any big game species is mapped within the Project Area. Big game seasonal ranges within the Project Area are quantified in Table 3-6.

**Table 3-6. Estimated Acreages of Big Game Seasonal Ranges in the Project Area.**

| Species | Herd Unit | Seasonal Range[1] | Acres in Project Area |
|---|---|---|---|
| Elk | Green River | WYL | 405.8 |
| Moose | Sublette | CWYL | 124.4 |
| Mule Deer | Sublette/Wyoming Range | CW | 153.2 |
| | | SSF | 769.8 |
| | | W | 38.6 |
| | | WYL | 98.5 |
| Pronghorn | Sublette North | CW | 650.6 |
| | | CWYL | 236.6 |
| | | SSF | 984.0 |
| | | WYL | 35.2 |

[1] CW = crucial winter; CWYL = crucial winter/year-long; SSF = spring/summer/fall; W = winter




**Map 3-1. Big Game Migration Corridors within the Project Area.**

*Pronghorn*

Pronghorn in the Project Area are part of Sublette North Herd Unit. The Sublette North Herd covers 27,715 square kilometers ($km^2$) (10,700 square miles) and has a population objective of 48,000 pronghorn (WGFD 2007a). In 2007, an estimated 60,100 pronghorn resided in this herd prior to the onset of winter with an end of biological year population estimated at 48,200 (WGFD 2007a). A survival study of the herd estimated an annual survival rate for the Sublette North Herd of 79%, 76%, and 70% for 2003/2004, 2004/2005, and 2005/2006, respectively (Grogan and Lindzey 2007). The survival estimates, without hunter harvest, were estimated at 82%, 83%, and 85% for those years. In addition to hunter harvest, mortalities were caused by vehicle collisions and fence entanglement.

Although pronghorn frequently use habitats within the Project Area all year, only the northern and western portions of the Project Area are classified as CWYL for the species (Map 3-1). Pronghorn seasonal use areas encompass the entire Project Area. Pronghorn CWYL is divided by the Green and New Fork rivers and is located in the Project Area as disjointed patches adjacent to these riparian zones.

The WGFD and Sawyer et al. (2005) have documented pronghorn migration corridors in the Project Area. Sawyer et al. (2005) documented a major seasonal migration route for pronghorn from their winter range in the Green River Basin to summer ranges in Grand Teton National Park and the Gros Ventre River drainage. This route passes through the Project Area east of and parallel to U.S. 191. Pronghorn funnel through natural landscape “bottlenecks” as they migrate, including the “Trapper’s Point” bottleneck west of the town of Pinedale. Radio-collared pronghorn left winter ranges in late March and early April, arriving at summer ranges by late May and early June. Autumnal migration occurred between October and December. Sawyer et al. (2005) noted the equal importance of summer, transition, and winter ranges in maintaining healthy populations of pronghorn.

*Mule Deer*

The Project Area is divided at the Green River between the Wyoming Range Herd Unit to the west and Sublette Herd Unit to the east. Only a small portion of the Project Area near the New Fork River is designated as seasonal range for the Sublette Herd Unit. Population estimates and objectives, respectively, for the Wyoming Range Herd Unit are 37,074 and 50,000 and for the Sublette Herd Unit are 31,241 and 32,000.

Winter and crucial winter ranges are located in the northern and western portions of the Project Area. A major migration pathway exists along the western edge of the Green River above its confluence with the New Fork River. As with pronghorn, deer funnel through natural landscape bottlenecks as they migrate, including the “Trapper’s Point” bottleneck (Sawyer et al. 2005). Western and central portions of the Project Area are designated as mule deer range. The Green and New Fork river corridors and adjacent uplands are winter and crucial winter ranges. Spring/summer/fall range is mapped in the Project Area west of the Green River.

Big sagebrush is a key browse species year round (BLM 1986), while the winter diet may be supplemented by mountain mahogany (*Cercocarpus* spp.), rabbitbrush, bitterbrush (*Purshia* spp.), and serviceberry (*Amelanchier* spp.) where available (BLM 2008a).

*Elk*
Elk winter/year-long range is mapped along and east of the Green River. Elk do not occupy seasonal ranges elsewhere in the Project Area. The Project Area is within the Green River Herd Unit with a population estimate and objective of 2,452 and 2,500 animals, respectively.

*Moose*
Moose are known to use the riparian area of the Green and New Fork rivers. Seasonal range is limited to riparian zones within the Project Area where the species can be found in willow-dominated sites. Moose CWYL is mapped as continuous, narrow bands along the Green and New Fork rivers within the Project Area that connect to more extensive CWYL in upstream drainages and along North, Middle, and South Piney creeks downstream of the Project Area. Moose do not occupy seasonal ranges outside of CWYL in the Project Area. Moose are part of the Sublette Herd Unit with a population estimate and objective of 4,629 and 5,500 animals, respectively.

#### 3.2.4.2 Small Mammals

Within the sagebrush community, common small mammals expected include desert cottontail (*Sylvilagus audubonii*), white-tailed jackrabbit (*Lepus townsendii*), Wyoming ground squirrel (*Spermophilus elegans*), white-tailed prairie dog, and badger (*Taxidea taxus*). Perennial riparian corridors may provide habitat for additional water-loving species, such as meadow vole (*Microtus pennsylvanicus*), beaver (*Castor canadensis*), and muskrat (*Ondatra zebethicus*).

#### 3.2.4.3 Reptiles and Amphibians

Ten species of reptiles and amphibians inhabit the PFO (BLM 2008a). Only five of these species have suitable habitat in the project area. Those associated with dry shrublands in the Project Area include northern sagebrush lizard (*Sceloporus graciosus graciosus*) and eastern short-horned lizard (*Phrynosoma hernandesi*). Amphibians and reptiles likely to occur within riparian corridors and within or near permanent and ephemeral wetlands of the Project Area include tiger salamander (*Ambystoma tigrinum*), northern leopard frog, and intermountain wandering gartersnake (*Thamnophis elegans vagrans*).

#### 3.2.4.4 Birds – Non-special Status Species

Bird species include sage-obligate species such as sage thrasher and sage sparrow, as well as several other common breeding species found in shrubsteppe in central Wyoming like horned lark (*Eremophila alpestris*), Brewer's sparrow, vesper sparrow (*Pooecetes gramineus*), and Brewer's blackbird (*Euphagus cyanocephalus*). Breeding raptor species may include northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and prairie falcon (*Falco mexicanus*), while rough-legged hawk (*B. lagopus*) and merlin (*F. columbarius*) may be present during winter migration.

Common bird species within riparian zones may include several breeding and migrant waterfowl, greater sandhill crane (*Grus canadensis tabida*), great blue heron (*Ardea herodius*), song sparrow (*Melospiza melodia*), and Bullock's oriole (*Icterus bullockii*).

#### 3.2.4.5 Aquatic Species

There are four perennial rivers within the Project Area that support fish: the New Fork River, the Green River upstream of the confluence with the New Fork River, Muddy Creek, and North Piney Creek. These waters are moderately productive coldwater fisheries and are managed as trout sport fisheries and for native non-game species.

The New Fork River, which is a tributary to the Green River, is estimated by the WGFD to have 81 to 424 pounds of trout per mile (stream class "yellow;" States West Water Resources Corporation 2000). Fish found in this section of the New Fork River include brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), longnose dace (*Rhinichthys cataractae*), mottled sculpin (*Cottus bairdii*), mountain sucker (*Catostomus platyrhynchus*), and mountain whitefish (*Prosopium williamsoni*).

The Green River above the confluence with the New Fork River is estimated by the WGFD to have 5 to 397 pounds of trout per mile (stream class "yellow"). Fish found in this section include bluehead sucker, brook trout, brown trout, carp (*Cyprinus carpio*), cutthroat trout, fathead minnow (*Pimephales promhales*), flannelmouth sucker, mottled sculpin, mountain whitefish, rainbow trout, redside shiner (*Richardsonius balteatus*), speckled dace (*Rhinichthys osculus*), and Utah chub (*Gila atraria*).

The fishery in Muddy Creek near the confluence with the Green River is composed primarily of native non-game fish. Fish found in this section include fathead minnow, flannelmouth sucker, flannelmouth/white sucker (*Catostomus commersoni*) hybrids, and white sucker. Other species found in Muddy Creek include brown trout, Colorado River cutthroat trout, mottled sculpin, mountain sucker, mountain whitefish, rainbow trout, redside shiner, speckled dace, and Utah chub.

North Piney, which is a tributary to the Green River, is managed for Colorado River cutthroat trout and native non-game fishes. North Piney Creek is estimated by the WGFD to have 12 to 121 pounds of trout per mile (stream class "yellow"). Fish species found in North Piney Creek include brook trout, Colorado River cutthroat trout, mottled sculpin, mountain sucker, and Snake River cutthroat trout (*Oncorhynchus clarkii bouvieri*). In 2004, instream flow water rights were granted in North Piney Creek from the west boundary of Section 16 downstream to 7.6 miles. Instream flow water rights are 25 cubic feet per second (cfs) from October 1 to May 14, 35 cfs from May 15 to June 30, and 40 cfs from July 1 to September 30.

The rivers within the Project Area drain into the Green River downstream of the confluence with the New Fork River. The Green River, between the New Fork River and Fontenelle Reservoir, is classified as a Class 2 trout fishery, which is a fishery of statewide importance. This section of the Green River is managed for brown trout, Snake River cutthroat trout, and native non-game fishes. This section of the Green River is estimated by the WGFD to have 37 to 514 pounds of trout per mile (stream class "red"). Fish found in the Green River, between the confluence with New Fork and Fontenelle Reservoir, include Snake River cutthroat trout, brown trout, rainbow trout, burbot (*Lota lota*), bluehead sucker, carp, fathead minnow, flannelmouth sucker, mottled sculpin, mountain sucker, mountain whitefish, roundtail chub, speckled dace, and Utah chub.

### 3.2.5 Noxious, Non-Native, and Invasive Plant Species

The Wyoming State Legislature enacted the Wyoming Weed and Pest Control Act of 1973 for the purpose of controlling designated weeds and pests. EO 13112 was signed in 1999 in order to establish the National Invasive Species Council, to prevent the introduction of invasive species, to provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause. This Act legitimately establishes each Wyoming County as a Weed and Pest Control District.

Noxious weeds are officially designated non-native plant species that are invasive and/or have the potential to become monocultures, and can cause harm to land value, native ecology, agricultural interests, wildlife habitat, livestock forage, riparian resources, and aesthetic and visual values of land. The United States Department of Agriculture (USDA) maintains an official list of weed species that are designated noxious species in the state of Wyoming, while each county maintains their own list of declared weeds.

Table 3-7 lists 30 noxious weeds present, or potentially present, in the Project Area. Of these, 25 species appear on the State of Wyoming Weed Control Act designated list and 5 occur on the Declared List of Weed species for Sublette County.

Of the 30 noxious weeds listed for the state, 16 are considered to be problematic in the PFO. Of the species listed in Table 3-7, perennial pepperweed (*Lepidium latifolium*), leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea maculosa*), Russian knapweed (*C. repens*), diffuse knapweed (*C. diffusa*), Canada thistle (*Cirsium arvenses*), Black henbane (*Hyposcyamus niger*), and Dyer's woad (*Isatis tinctoria*) are considered to have the highest management priority within the PFO planning area. Cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola tragus*) are other weed species known to be present within the planning area. Although not officially designated noxious, they can be disruptive to native plant communities. Of these, halogeton is the most problematic in the planning area.

Weeds within the Project Area are present primarily in locations of disturbance, including along roads, in areas of oil and gas development, and in heavily grazed areas. Occurrence of these weed species has a much higher probability in areas of past disturbance and varies according to basic vegetative cover type. Because invasive and noxious plants are typically very aggressive, special management is required to prevent existing infestations from spreading, or to eradicate these infestations, and prevent the introduction of noxious weed seed from outside sources.

**Table 3-7. Noxious Weeds as Designated by the Wyoming Weed and Pest Control Act.**

| Common Name | Scientific Name | Wyoming Noxious Weed List | Sublette County Weed List | Present in Pinedale Planning Area |
|---|---|---|---|---|
| Austrian fieldcress | *Rorippa austriaca* | | X | |
| Black henbane | *Hyposcyamus niger* | | X | X |
| Canada thistle | *Cirsium arvenses* | X | | X |
| Common burdock | *Arctium minus* | X | | |
| Common St. Johnswort | *Hypericum perforatum* | X | | |
| Common tansy | *Tanacetum vulgare* | X | | |
| Dalmatian toadflax | *Linaria dalmatica* | X | | X |
| Diffuse knapweed | *Centaurea diffusa* | X | | |
| Dyers woad | *Isatis tinctoria* | X | | X |
| Field bindweed | *Convolvulus arvensis* | X | | X |
| Field scabiousus | *Knautia arvensis* | | X | |
| Hoary cress | *Cardaria draba, C. pubescens* | X | | X |
| Houndstongue | *Cynoglossum officinale* | X | | X |
| Leafy spurge | *Euphorbia esula* | X | | X |
| Musk thistle | *Carduus nutans* | X | | X |
| Ox-eye daisy | *Chrysanthemum leucanthemum* | X | | X |
| Perennial pepperweed | *Lepidium latifolium* | X | | X |
| Perennial sowthistle | *Sonchus arvensis* | X | | X |
| Plumeless thistle | *Carduus acanthoides* | X | | |
| Purple loosestrife | *Lythrum salicaria* | X | | |
| Quackgrass | *Agropyron repens* | X | | |
| Russian knapweed | *Centaurea repens* | X | | X |
| Russian olive | *Elaeagnus angustifolia* | X | | X |
| Saltcedar | *Tamarix* spp. | X | | X |
| Scentless chamomile | *Tripleurospermum inodorum* | | X | |
| Scotch thistle | *Onopordum acanthium* | X | | |
| Skeletonleaf bursage | *Franseria discolor Nutt.* | X | | |
| Spotted knapweed | *Centaurea maculosa* | X | | |
| Western water hemlock | *Cicuta douglasii* | | X | |
| Yellow toadflax | *Linaria vulgaris* | X | | X |

Sources: USDA 2003; Wyoming Weed and Pest Council 2008

## 3.3 HUMAN ENVIRONMENT

### 3.3.1 Livestock and Range Resources

BLM-administered rangelands are managed following the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management which specifies minimum acceptable health, productivity, and sustainability conditions (BLM 1997b). The Wyoming BLM is responsible for the development of standards for healthy rangelands and management for four fundamentals: 1) watersheds are functioning properly; 2) water, nutrients, and energy are cycling properly; 3) water quality meets state standards; and 4) habitat for special status species is protected (BLM 1997b).

The Project Area includes portions of nine BLM grazing allotments that are permitted for a total of 18,475 Animal Unit Months (AUMs) (an AUM is the amount of forage required to maintain either a 1,000-pound cow and calf under 6 months of age, five sheep, or one horse for 1 month). The affected allotments extend well beyond that of the Project Area. Domestic livestock grazing administered by the BLM in the PFO and RSFO involves mostly cattle use with a few horse grazing permits. Based on level of improvement effort from low to high, grazing allotments are placed in three management categories: custodial, maintain, or improve. Information about permitted AUM and management objectives for range allotments in the Project Area is provided in Table 3-8.

**Table 3-8. Grazing Allotments in the Project Area.**

| Allotment Name | Total Allotment Acres | BLM Permitted AUM | Acres per AUM | Livestock Type and Grazing Dates | Management Category | Meeting Standards |
|---|---|---|---|---|---|---|
| Blue Rim Desert | 39,610 | 2,826 | 14.0 | Cattle 5/1–6/21 | Maintain | Yes |
| Blue Rim Individual | 40,945 | 3,258 | 12.6 | Cattle 5/10–6/23 | Maintain | Yes |
| Boundary | 32,028 | 3,626 | 8.8 | Cattle/sheep 5/1–1/31 | Maintain | Yes |
| Marincic Mesa Individual | 6,006 | 350 | 17.2 | Cattle 5/10–6/15 | Improve | Yes |
| Mesa Common | 57,649 | 4,701 | 12.3 | Cattle 5/5–11/5, Horse 5/1–10/31 | Maintain | Yes |
| Muleshoe | 10,279 | 677 | 15.2 | Cattle 5/10–7/9 | Maintain | Not evaluated |
| Northwest Square Top Individual | 7,004 | 800 | 8.8 | Cattle 5/1–6/30 | Maintain | Yes |
| Piney Bridge Individual | 2,320 | 131 | 17.7 | Cattle 5/5–6/4, Horse 6/1–9/15 | Maintain | Yes |
| Stud Horse Common | 15,088 | 2,106 | 7.2 | Horse 5/1–6/30 | Improve | No |

Sources: BLM 2008a, 1997a

### 3.3.2 Socioeconomic Resources

The scope of the analysis for social and economic resources includes a discussion of current social and economic data relevant to the proposed Project, including population, demographics, employment, income, housing, and taxes in Sublette County, Wyoming. Also included are data relating to the State of Wyoming and the United States, as available, which provides for a comparative discussion when analyzed against the study area.

Information in this section was obtained from various sources including U.S. Census Bureau, the State of Wyoming, and the Sonoran Institute's Economic Profile System database which uses different sources of information including Bureau of Economic Analysis (BEA) and Wyoming state data.

#### 3.3.2.1 Population

As illustrated in Table 3-9 below, between 2000 and 2007, the population of Sublette County grew by an average of 33.8% (4.3% annualized) to approximately 7,925 residents (State of Wyoming 2008a); the Wyoming and United States growth rates for the same period were 5.88 and 7.01%, respectively. Between 2006 and 2007, Sublette County was the fifth fastest growing county among more than 3,000 counties in the nation; the second fastest growing county west of the Mississippi River; and the fastest growing county of the 23 counties in Wyoming (Jacquet 2008). Population growth in the county can be attributed largely to economic opportunities from energy development and service industries; regional population growth can lead to an increase in demand for electrical power.

**Table 3-9. Historic, Current, and Projected Population Size for Sublette County, as Compared to the State of Wyoming and the United States, 1980–2020.**

| Location | 1980 | 1990 | 2000 | 2007 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| Sublette County | 4,548 | 4,843 | 5,920 | 7,925 | 9,170 | 11,200 | 13,370 |
| State of Wyoming | 469,557 | 453,588 | 493,782 | 522,830 | 539,740 | 560,000 | 578,730 |
| U.S. (thousands) | 226,545 | 248,709 | 281,421 | 301,139 | 308,935 | 322,365 | 335,804 |

Source: State of Wyoming 2008a.

The towns of Pinedale, Marbleton, and Big Piney had the highest population in 2007 with approximately 1,813, 917, and 517 residents, respectively, comprising approximately 41% of the county's population. The remaining 59% percent of the county's 2007 population lived in smaller communities such as Bondurant, Boulder, Cora, and Daniel. Based on U.S. Census Bureau population projections, Sublette County's population is expected to grow approximately 125.8% over the 2000 Census population to approximately 13,370 by the year 2020. With an area approximately 4,883 square miles in size, Sublette County had a population density of 1.2 people per square mile in the year 2000. This compares to the State of Wyoming which had a population density of 5.1 people per square mile (State of Wyoming 2000).

Ethnic diversity is limited in Sublette County with White, Non-Hispanic residents comprising approximately 97.9% of the population. Other ethnicities include African American (0.21%),

Native American/Alaskan (0.66%), Asian (0.29%), Hawaiian (0.06%), and two or more races (0.81%) (U.S. Census Bureau 2008).

#### 3.3.2.2 Employment and Income

*Employment*

Employment in Sublette County is typical of many rural areas and relies on natural resource-based industries such as mining, oil and gas development, and agricultural activity to employ a large part of the workforce. Broken down by industry, according to the North American Industrial Classification System (NAICS), approximately 5,703 people comprised Sublette County's total 2005 workforce. Of this, mining employed the largest number of people, comprising approximately 14.8% (849 people) of the regional workforce. Other dominant industries include government and government enterprises at 14.7% (840 people), construction at 14.2% (814 people), and accommodation and food services at 9% (512 people) (Headwaters Economics 2007).

*Unemployment*

As of July 2008, the unemployment rate in Sublette County was approximately 1.5%, which is well below the state rate of 3.0% and below the national average of 6.0% (Wyoming Department of Employment 2008).

*Income*

According to the BEA, total personal income in Sublette County for 2006 was approximately $355 million, an increase of approximately 21% from 2005, which was approximately $293 million. The 2005 figure was 96% above the 2000 total, which was $200 million (State of Wyoming 2008b). Of the 2006 personal income, the largest source was Net Earnings by Place of Residence at approximately 70.4%. Net Earnings by Place of Residence includes wages, salaries, and proprietor (self-employed) income.

The second largest source of personal income in 2006 was investments making up approximately 22.2%. Investment income includes earnings made from dividends, interest, and rent.

The smallest source of personal income for Sublette County in 2006 was transfer payments at approximately 7.3%. Transfer payments represent payments from government to individuals. They are primarily payments such as Social Security, some welfare program payments, Medicare, and Medicaid.

As demonstrated in Table 3-10 below, per capita personal income in Sublette County is above the average for the state of Wyoming and the United States. In 2006, per capita income in Sublette County was approximately $49,077. This is above the average per capita income for the State of Wyoming ($40,655) and the United States ($36,714).

**Table 3-10. Sublette County Per Capita Income as Compared to the State of Wyoming and the United States.**

| Area Name | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|
| Sublette County | $30,760 | $31,827 | $35,211 | $38,989 | $42,621 | $49,077 |
| Wyoming | $30,367 | $31,101 | $32,882 | $35,283 | $37,316 | $40,655 |
| United States | $30,574 | $30,821 | $31,504 | $33,123 | $34,757 | $36,714 |

3.3.2.3 Housing

Characteristics of the housing supply in Sublette County and Wyoming are shown in Table 3-11. Growth in the energy exploration and development industry has impacted the availability and cost of housing in Sublette County. As of 2006, there were approximately 4,118 housing units in the county, reflecting an increase of 15.9% since 2000, compared to 6.8% growth for the State of Wyoming over the same time period.

**Table 3-11. Housing Characteristics for Sublette County and the State of Wyoming.**

| Year | Sublette County | | Wyoming | |
|---|---|---|---|---|
| | Housing Units | % Change from Previous Year | Housing Units | % Change from Previous Year |
| 2000 | 3,552 | -- | 223,854 | -- |
| 2001 | 3,620 | 1.91 | 225,959 | 0.94 |
| 2002 | 3,693 | 3.97 | 227,772 | 1.75 |
| 2003 | 3,773 | 6.22 | 229,638 | 2.58 |
| 2004 | 3,859 | 8.64 | 232,560 | 3.89 |
| 2005 | 3,944 | 11.04 | 235,657 | 5.27 |
| 2006 | 4,118 | 15.93 | 239,178 | 6.85 |

Source: Wyoming Housing Database Partnership 2008.

The most recent statistical housing data available for Sublette County are from the 2000 census. In 2000, approximately 73% of the housing units were classified as primary housing units with the remaining 26.2% classified as either seasonal or second homes (U.S. Census Bureau 2000). This seasonal/second home rate is substantially higher than the second home rate for the State of Wyoming, which stands at approximately 5.5% of total houses. Between 2001 and 2006, rental units in Sublette County increased approximately 288%, increasing from 41 to 159. The growth rate of housing in Sublette County is greater than that of the population rate because household size is decreasing and the second homeowner rate has increased over past rates, in which second homeowners may or may not declare Sublette County as their primary residence (Sonoran Institute n.d.).

*Housing Costs*

Between the fourth quarter of 2000 and 2007, the overall cost of living in Sublette County increased substantially. The cost of renting an apartment in Sublette County increased 85%, from $464 to $860 per month, and the cost of renting a house increased 145%, from $566 to $1,387 per month. Mobile home rentals also realized an increase in price, rising 107% from

$325 to $674 per month. Renting a mobile home lot increased 66% from $165 to $275 per month (Wyoming Housing Database Partnership 2008).

Single family home sales prices also realized an increase. As illustrated in Table 3-12 below, the average sales price of an existing, detached, single family home in Sublette County increased from $125,922 in 2000 to $334,073 in 2007; this is an increase of over 165% over a seven-year period. These figures compare to the state average single-home value of $111,437 in 2000 and $271,030 in 2005 (Wyoming Housing Database Partnership 2008). This data suggests that demand for single-family housing in the three-county study area is greater than the state, largely due to increased oil and gas activity in the region.

**Table 3-12. Average Sales Prices Reported by Assessors for Sublette County and the State of Wyoming, 1999 through 2007.**

| Unit of Measure | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** |
| **Sublette County** | | | | | | | | | |
| Sales Price | $114,020 | $125,922 | $149,179 | $163,473 | $173,116 | $218,343 | $249,029 | $269,795 | $334,073 |
| Change from 1998 | 9.2% | 20.6% | 42.9% | 56.6% | 65.8% | 109.2% | 138.6% | 158.5% | 200.2% |
| **State of Wyoming** | | | | | | | | | |
| Sales Price | $101,517 | $111,437 | $116,469 | $121,140 | $132,708 | $142,501 | $159,776 | $187,869 | $271,030 |
| Change from 1998 | 4.7% | 15% | 20.2% | 24.1% | 34.4% | 52.3% | 65.6% | 93.8% | 179.7% |

Source: Wyoming Housing Database Partnership 2008.

*Housing Needs Assessment*

To understand and address the increase in the local population and housing needs, the Wyoming Community Development Authority, a coalition of Wyoming State departments, releases the annual Wyoming Housing Needs Forecast report. The 2008 report offers three alternative housing forecasts: a moderate growth scenario; a strong growth scenario; and a very strong growth scenario (Wyoming Community Development Authority 2008). This analysis only discusses the strong growth scenario. Based on 2000 census data, the strong growth forecast for Sublette County anticipates a need for approximately 6,903 additional units by the year 2030. This means that as many as 230 new households per year would need to be constructed to keep pace with future growth. This would result in an average annual increase of 8.31% between 2007 and 2030, and a total increase of 191% for the same time period.

#### 3.3.2.4 Quality and Cost of Living

An area's cost of living can be represented in the Cost of Living Index, which is a theoretical pricing index that measures relative cost of living over time and shows the difference in living costs between cities. The Cost of Living Index uses a numerical range between 1 and 100 to rate a geographical area's cost of living compared to the state average. A Cost of Living Rate

of 100 represents the state's average. Anything below 100 means that it is less expensive than the state average and anything above 100 indicates that it is more expensive than the state average.

The cost of living for Sublette County is based the Economic Analysis Division's Wyoming Cost of Living Index (WCLI) report for the fourth quarter of 2007. The WCLI summarizes price data collected from 28 cities and towns throughout Wyoming over the period of January 9 through 11, 2008. The price data are aggregated into six categories, which were then weighted according to their overall importance in the average consumer's budget. These categories and their respective weight components include Housing (43%), Transportation (17.2%), Food (13.9%), Recreation and Personal Care (9.4%), Medical (6.3%), and Apparel (4.9%) (State of Wyoming 2008c).

As illustrated in Table 3-13, the cost of living in Sublette County is more expensive than the state-wide average, with the exception of medical service. The cost of housing in Sublette County is the primary factor in the region's high cost of living. Recent economic expansion of oil and gas economic activity has increased the cost of housing and other economic indicators in this region and other mineral-rich areas when compared to the rest of the state.

**Table 3-13. Sublette County Cost of Living Index, Fourth Quarter 2007.**

| County | Apparel | Housing | Transportation | Food | Recreation and Personal Care | Medical | All items (total) |
|---|---|---|---|---|---|---|---|
| Sublette | 122 | 132 | 102 | 106 | 111 | 98 | 122 |

Source: State of Wyoming 2008c.

3.3.2.5 Infrastructure and Services

The effect of demand from the oil and gas industry on the availability and cost of infrastructure and public services can be dramatic and have an impact on the resources described in the following section. Existing infrastructure and services in the region are described below.

**Telecommunications:** Four telecommunication companies service Sublette County: All West Communications, Century Telephone, Contact Communications, and Visionary.

**Energy/Power Providers:** Rocky Mountain Power is an investor-owned utility that delivers electricity to customers in Utah, Wyoming, and Idaho and is headquartered in Salt Lake City, Utah. It is a division of PacifiCorp, which is headquartered in Portland, Oregon. Both are holdings of Mid-American Energy Holdings Company.

Rocky Mountain Power currently provides service to approximately 136,000 customers in its service area across Utah, Wyoming, and Idaho, with more than 8,522,453 megawatt hours (Mwh) annual energy sales to customers in Wyoming alone. Rocky Mountain Power operates a transmission grid in Wyoming which connects customers to four major coal generation plants in Wyoming. Rocky Mountain Power power plants include WYODAK (268 Mw capacity, coal burning), Jim Bridger (1,414 Mw capacity, coal burning), Dave Johnston (762 Mw capacity, coal burning), and Naughton (700 Mw capacity, coal burning).

Sublette County has recently undergone socioeconomic changes as natural gas drilling activity has boomed on the nearby Jonah Gas and Pinedale Anticline Fields.

Due to the increase in industry and population, energy demand in Sublette County has increased since 2005 and is projected to continue increasing for the foreseeable future; Table 3-14 below demonstrates historic, current, and future electricity demands in Sublette County. Existing electrical transmission infrastructure in the Project Area and Pinedale is reaching its limits for maintaining voltage during peak usage periods. Current power demands exceed the capacity of the existing line, and voltage regulators periodically fail, creating outages and frequent voltage fluctuations to users. These fluctuations have led to intermittent brownouts and "blinks," which can cause damage to many types of electrical equipment. The resulting intermittent power outages disrupt business and daily activities in Pinedale and the surrounding areas, and should prolonged outages occur during severe winter conditions, the public could be at risk.

**Table 3-14. Current and Projected Electricity Demand in Sublette County, Wyoming.**

| Year | Mw Electricity Demand | Projected Percent Increase |
|---|---|---|
| 2005 | 20 | n/a |
| 2008 | 37 | 85% |
| 2009 | 122 | 230% |
| 2010 | 276 | 126% |
| 2011 | 359 | 30% |

Source: Rocky Mountain Power pers. comm. with C. Oakes, SWCA.

To temporarily address the lack of capacity to meet the electrical needs of the Project Area, Rocky Mountain Power has recently resorted to installing a diesel-powered electrical generator as a stop-gap measure at the Pinedale Substation, exacerbating ongoing air quality problems in the area.

**Airports/Railroads:** Three airports service Sublette County. Big Piney-Marbleton airport is located 1 mile north of the town of Marbleton and Big Piney Aviation is the fixed based operator. Ralph Wenz Field is located 5 miles southeast of Pinedale and New Breed Aviation is the fixed based operator. Jackson Hole is located 7 miles north of Jackson with commercial service provided by Sky West, American, United, Air Wisconsin, and Great Lakes. Sublette County does not have any railroad service.

**Education:** The Sublette County educational system consists of two school districts: #1 and #9. As of October 2007, total enrollment at both school districts was 1,620. This represents an 8.9% increase (133 students) in total October 2006 student enrollment.

**Crime:** The Wyoming Attorney General, Division of Criminal Investigation (DCI) produces annual reports on crime statistics for the State of Wyoming.

According to Uniform Crime Reports (UCR) data, the number of annual total arrests in the State of Wyoming increased by 5,719 arrests, or 16.8%, between 2000 and 2007 (Wyoming State Government [WSG] 2007). Overall arrests in Sublette County increased by 260 (107%)

between the same time period (WSG 2007). Notable increases in arrests were recorded for aggravated assault, drug possession, and driving under the influence during this time period. Notable decreases in arrests occurred for fraud and vandalism.

#### 3.3.2.6 Taxes and Revenues

Unlike other states, the State of Wyoming does not assess certain taxes, including taxes on intangible assets such as bank accounts, stocks, or bonds. The state also does not assess any tax on retirement funds, corporate state income tax, personal state income tax, and inventory tax. Therefore, the state relies on other forms of revenue and taxation to generate important income.

The mineral exploration and development industries have long been an important part of Wyoming's history, beginning in the mid- to late 1800s, and are vital to the economic well being of the state. As such, the minerals industry accounts for a substantial share of state revenues, through taxation and other methods of payment, to the state and regional economies.

Produced minerals are classified as personal property, and mineral producers pay two types of taxes: the mineral property (ad valorem) tax imposed by the county on mineral production, and the severance tax imposed by the state on mineral production. The owner of the minerals also collects payment from the mineral extractor in the form of royalties. For state and federally owned lands, the state receives a base royalty of 16.7% of the value of mineral production. Federally owned land is not subject to federal property taxes, which are important to support local government operations and education. To help offset this loss, in 1976 Congress authorized federal land agencies to share income with state and counties and provided a Payment in Lieu of Taxes program to help compensate lost tax revenue otherwise incurred by local governments for lands within their boundaries.

The Project would not in any way affect tax collections based on the mineral property tax, severance tax, and mineral royalties, and these have been excluded from further analysis.

*Sales, Use, and Lodging Tax*

Sales, use, and lodging taxes increase significantly during large local construction project as temporary workers spend money within the local economy. Wyoming law requires that the Department of Revenue collect sales and use taxes as well as the assessment of fees, interest, and penalty from vendors and consumers. The lodging tax is an optional tax imposed by towns and cities. The use tax is a companion to the sales tax and is imposed upon goods purchased tax-free outside Wyoming, for use in Wyoming. Wyoming's sale and use tax rates have been updated several times since their introduction in 1935. Effective tax rates for Sublette County as of October 2007 are 4% for state sales tax and 3% for lodging tax. Table 3-15 summarizes total sales tax collections for Sublette County and the State of Wyoming.

Cities, towns, and counties may impose a lodging excise tax of up to 4% on all sleeping accommodations for guests staying less than 30 days. This tax extends to mobile accommodations, such as tents, trailers, and campers. At least 90% of the tax distributions must be used to promote travel and tourism within the county, city, or town imposing the tax.

Total lodging tax collections for the counties in the study area and the state of Wyoming are presented in Table 3-15.

**Table 3-15. Total Sales, Use, and Lodging Tax Collections for Sublette County and the State of Wyoming, FY 2002 through FY 2007.**

| Entity, by Fiscal Year | Total Sales Tax Collections | Total Use Tax Collections | Total Lodging Tax Collections |
|---|---|---|---|
| **FY2002** | | | |
| Sublette County | $19,915,371 | $1,011,875 | $104,095 |
| State of Wyoming | $515,799,683 | $62,491,361 | $3,939,521 |
| **FY2003** | | | |
| Sublette County | $19,431,841 | $1,493,902 | $123,709 |
| State of Wyoming | $503,970,199 | $54,866,020 | $4,108,475 |
| **FY2004** | | | |
| Sublette County | $26,192,510 | $1,923,274 | $141,918 |
| State of Wyoming | $551,668,565 | $58,387,269 | $4,738,192 |
| **FY2005** | | | |
| Sublette County | $34,646,196 | $2,732,862 | $166,656 |
| State of Wyoming | $603,951,798 | $64,326,659 | $4,960,822 |
| **FY2006** | | | |
| Sublette County | $47,938,056 | $4,347,177 | $235,479 |
| State of Wyoming | $719,115,277 | $82,158,509 | $5,859,863 |
| **FY2007** | | | |
| Sublette County | $68,563,216 | $8,023,84 | $256,324 |
| State of Wyoming | $799,254,374 | $113,045,113 | $6,843,052 |

Source: Liu 2007.

*Rocky Mountain Power Rates and Revenues*

Rocky Mountain Power is one of four investor-owned utilities operating in Wyoming. Of the four utilities providing electricity in Wyoming (Rocky Mountain Power, Black Hills Power & Light Co., Cheyenne Light Fuel & Power, and Montana Dakota Utility Co.), Rocky Mountain Power has the lowest average per kilowatt hour (kWh) cost at $0.067133 (effective October 15, 2008) (Wyoming Public Service Commission 2008), compared to the highest average per kWh cost at $0.99330.

In 2007, Rocky Mountain Power sold 10.47 billion kWh to customers within Wyoming, generating $555.5 million in sales (operating revenue). Operating revenue was offset by $478.49 million in operating expenses in 2007. Of the 2007 kWh sold in Wyoming, 9.78% served residential areas and towns, while over 71% served commercial and industrial operations across Wyoming (Wyoming Public Service Commission 2003, 2007).

### 3.3.3 Recreation Resources

The scope of analysis for recreation resources discusses current recreation activities and trends occurring within Sublette County, Wyoming, and the area immediately surrounding and adjacent to the Project Area and how the Proposed Action or alternatives may affect these resources. Recreation resources on BLM-administered land within the Project Area are

characterized by open spaces along the Green and New Fork rivers with dispersed primitive recreation opportunities. The BLM issues commercial permits within the PFO to 40 operators serving clients associated with big game hunting, fishing, and competitive and group activities on public lands within the planning area. As such, public lands in Sublette County support a substantial amount of outdoor recreation use by both local residents and visitors to the area. Information in this section was obtained from various sources including, but not limited to, the Pinedale RMP (BLM 2008a) and the WGFD.

Due to the diversity of attractive natural features and topography such as the Upper Green River and several major mountain ranges, portions of the Project Area are valued for their recreational opportunities. Within the approximately 912,000 acres administered by the BLM's PFO, the agency focuses on providing undeveloped recreation opportunities such as off-highway vehicle (OHV) use, boating, hunting, fishing, wildlife viewing, camping, and hiking. According to the BLM, recreational activity and intensity is steadily increasing, particularly in remote and unpopulated areas offering a primitive recreation experience.

#### 3.3.3.1 Special Recreation Management Areas and Extensive Recreation Management Areas

The management goal for recreation resources under the revised Pinedale RMP is to "Provide substantial personal, community, economic, and environmental benefits to local residents and visitors through recreational uses of the public lands (BLM 2008a p. 2-25)." As such, the revised RMP and ROD identifies two basic units of recreational management that provide specific recreational activities and opportunities. They are Extensive Recreation Management Areas (ERMAs) and Special Recreation Management Areas (SRMAs). ERMAs are areas not specifically designated as an SRMA and include all BLM-administered lands outside SRMAs where dispersed recreation activity generally occurs. SRMAs are designated to protect unique recreational settings and experiences, which would provide substantial long-term personal, environmental, and economic recreational benefits (BLM 2008a). The only SRMA within the Project Area is the 32,560-acre Green and New Fork rivers SRMA. The SRMA is comprised of a consortium of disconnected land parcels that run along the Green River between Warren Bridge (located 10 miles north of Daniel) and just south of Big Piney and along the New Fork River between Pinedale and Big Piney.

According to the Pinedale RMP, a Recreation Area Management Plan (RAMP) will be developed for the Green and New Fork rivers SRMA that would provide additional Special Recreation Permits (SRPs) and allotted river use for commercial SRPs for the SRMA (BLM 2008a). However, until a RAMP is produced, SRMAs are managed according to the Recreation Opportunity Spectrum (ROS). The ROS method is widely used by the BLM and other land agencies and classifies recreational opportunities on federal land based on elements of the setting, such as access and remoteness. The goals of the ROS system are to 1) establish outdoor recreation management goals and objectives for specific areas; 2) allow for modification of recreational opportunities when other resource management actions are needed; and 3) establish standards for an area that would allow monitoring of the recreational experience and opportunity setting (BLM 2008a). The Pinedale RMP depicts the ROS classifications as Natural Resource Recreation settings and provides a classification range from undeveloped (Primitive – characterized) to substantially modified (Urban).

Two Natural Resource Recreation settings have been identified within the Green and New Fork rivers SRMA. They are Front Country and Middle Country. The Front Country setting is located outside of the Project Area. The Middle Country setting is located within the Project Area along the Green and New Fork rivers and comprises the remaining BLM-administered land within 0.25 mile on each side of the Green and New Fork rivers from about U.S. 191 downstream to Fontenelle Reservoir (BLM 2008a). Factors used to determine these setting classifications include remoteness, naturalness, facilities, social encounters, access, visitor impacts, and visitor management. The Pinedale RMP provides the following definition for the Middle Country Natural Resource Recreation Setting:

According to the Revised Pinedale RMP, the Middle Country Zone for this SRMA is considered a community and destination market with recreation users being local residents and regional and national visitors. The Recreation Market Segment for the Middle Country Zone is for visitors to enjoy river-related recreation activities in a less structured setting where access is more dispersed and amenities are few. A greater degree of self-reliance is required in the Middle Country Zone (BLM 2008a). The Management Objective for the Green and New Fork rivers SRMA is to manage each zone to provide opportunities for the public to achieve targeted, high-quality recreation activities and experiences that produce significant benefits to the visiting public (BLM 2008a). The Middle Country Zone is also available for fluid mineral leasing, but no surface disturbance is allowed within 0.25 mile on either side of the river. Visual Resource Management (VRM) Class II objectives apply to all of the SRMA except for approximately 6 miles of the Green River near LaBarge, Wyoming.

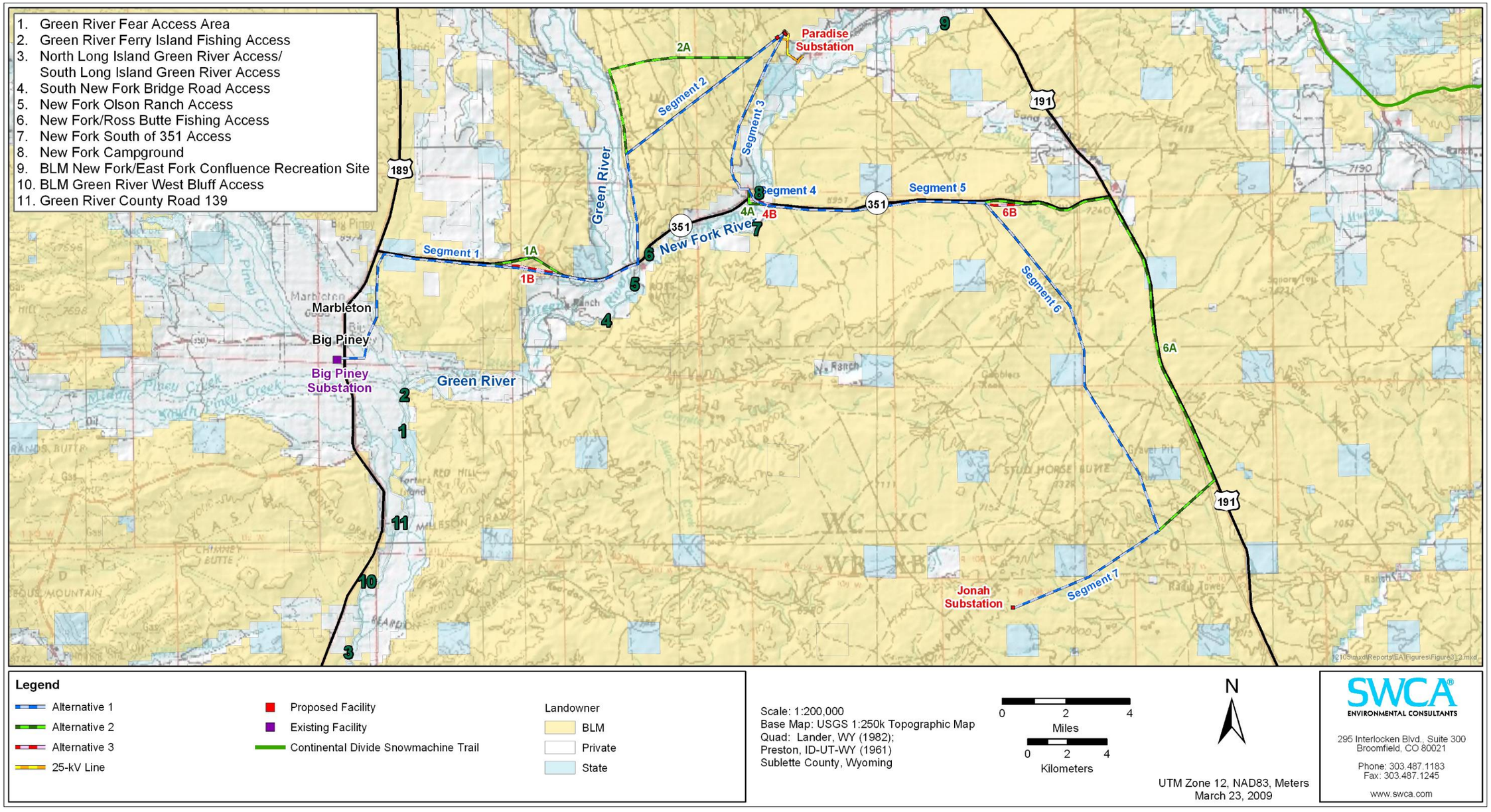
#### 3.3.3.2 Recreation Sites

In addition to the SRMAs and the Natural Resource Recreation settings, there are several developed and primitive recreation areas surrounding the Project Area and along the proposed transmission line alignment (Map 3-2). Some of these recreation sites provide easy access to the Green and New Fork rivers, while others provide more than one feature, such as river access, boating, and camping.

The South New Fork Bridge Road Access is located along the Green River approximately 1 mile south of the propose alignment and approximately 1.3 miles east of the confluence of the Green and New Fork rivers as the river flows. This recreation area consists of primitive campgrounds and barbeque grills.

The New Fork Olson Ranch Access is also located along the Green River approximately 0.25 mile south of the proposed alignment and approximately 3 miles northeast of the confluence of the Green and New Fork rivers as the river flows. This area offers the recreating public with boat launch to the Green River and pedestrian access for swimming.

The New Fork/Ross Butte Fishing Access Area is located along the ROW of SH 351, east of and adjacent to the proposed alignment. This site is located approximately 4.25 miles northeast of the confluence of the Green and New Fork rivers and provides the recreating public with access to these rivers for fishing and swimming opportunities.




**Map 3-2. Recreation Resources within the Project Area.**

The New Fork South of 351 Access Area is located approximately 1 mile south of the SH 351 and the proposed alignment and approximately 8.25 miles northeast of the confluence of the Green and New Fork rivers as the river flows. This primitive area provides fishing and swimming access to the New Fork River. The area also consists of a cliff that is occasionally used for cliff diving.

The most developed recreation site in this section of the Project Area is the New Fork Campground, located along SH 351 and directly adjacent to the proposed alignment as described in the Proposed Action. This popular area is located approximately 9.5 miles from the confluence of the Green and New Fork rivers as the river flows and provides the recreating public with a boat launch site, restrooms, several primitive campsites, and pedestrian access to the New Fork River for swimming and fishing activities.

Easy access to the area and an expanding population has led to an increase in recreational use within the study area. The heaviest use typically occurs during the summer months beginning around mid-June through the end of September. The most popular activities during this time are hunting, fishing, sightseeing, raft trips, and hiking. During the winter months, snowmobiling and cross-country skiing are popular activities in the southwest Wyoming region.

#### 3.3.3.3 Ross Butte Management Area

In addition to developed recreation sites, the Pinedale RMP identifies several Special Designations and Management Areas. Among these the 35,670-acre Ross Butte Management Area is partially located within the southern section of the Project Area. According to the Pinedale RMP, the management goal for the Ross Butte area is to “Protect fragile soils and watersheds, sensitive plant species and communities, paleontological and archeological sites, unique geology, and visual values in the Ross Butte area.” Regarding recreation use in this area, the RMP limits OHV use to the designated roads and trails.

#### 3.3.3.4 Fishing

As discussed above, opportunities for fishing are abundant within the Project Area and are provided in the Green and New Fork rivers as well as perennial streams that flow into these rivers. The New Fork River within the Project Area drains into the Green River downstream of the confluence with the New Fork River; both rivers are part of the Colorado River drainage system. Four perennial rivers within the Project Area support fish: the New Fork River, the Green River upstream of the confluence with the New Fork River, Muddy Creek, and North Piney Creek. The Green River, between the New Fork River and Fontenelle Reservoir, is classified as a Class 2 trout fishery, which is a fishery of statewide importance. These waters are moderately productive coldwater fisheries and are managed as trout sport fisheries and for native non-game species.

#### 3.3.3.5 Off-Highway Vehicle Use and Cross-Country Skiing

An OHV is defined as a motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain (43 CFR 8340.0-5). In the Project Area, motorized vehicle use, except for over-the-snow equipment, is limited to existing roads and trails unless otherwise specified (BLM 2007b). There are also certain areas within the PFO

that are closed to OHV use. No designated open OHV use areas are within the PFO. To further manage motorized vehicle use, the ROD states that transportation planning will be completed within 5 years of implementation of the RMP. However, two management goals for the PFO related to transportation, access, and travel management are identified in the ROD and state: 1) provide access for approved public land uses consistent with public health and safety and other resource value concerns; and 2) provide opportunities for OHV use and activities, including motorized, nonmotorized mechanized, and foot travel where compatible with other resource values (BLM 2007b). The ROD goes on to state that OHV designations for restrictions to existing roads and trails will remain in effect until travel management planning is completed and designated roads and trails are identified. In the Project Area, motorized vehicle use, except for over-the-snow equipment, is limited to existing roads and trails in the Green and New Fork rivers SRMA and the Ross Butte Management Area (BLM 2007b).

Snowmobile trails are managed cooperatively by the Wyoming State Trails Program and the landowner or land manager responsible for the lands on which the trails are located. Typically, the BLM, under the terms and conditions of a Memorandum of Understanding, authorizes the State of Wyoming to establish and maintain the snowmobile trails. A total of 1,318 OHV permits were purchased in Sublette County in 2007 (Wyoming State Trails Program 2007).

Cross-country skiing is possible in most areas surrounding and within the Project Area when conditions permit. Although no formal groomed trails are offered, tracks become apparent over time offering plenty of opportunities for solitude and wildlife viewing.

#### 3.3.3.6 Big Game Hunting

Data related to big game hunting and harvest was obtained from the 2007 Annual Report of Big and Trophy Game Harvest published by the WGFD (2007b). Hunting is an important part of the regional infrastructure as it is one of the most popular recreational activities. Sublette County boasts of its abundant hunting grounds in its marketing campaign. WGFD administers hunting permits and monitors use within the hunt areas that are fully and partially located on BLM lands. The presence and variety of wildlife, especially big game, is the primary draw for hunters to the area. Big game hunting permits within the Project Area are issued for pronghorn, mule deer, elk, and moose.

To monitor hunting on public lands, the WGFD segregates public hunting grounds into numerical Hunt Areas. These Hunt Areas vary for big game hunting licenses issued throughout the state. This enables the WGFD to assess yearly population estimates and compile data to create objectives that help wildlife managers regulate animal numbers, primarily through numbers of hunting licenses sold. Table 3-16 summarizes hunting data and harvest statistics for Hunt Areas that overlap the Project Area.

**Table 3-16. Recreation User Days for Big Game Hunting by Hunt Area in or Adjacent to the Project Area, 2007.**

| Species | Hunt Area | Hunter Days | Licenses Sold | Active License/ Hunters | Total Harvest |
|---|---|---|---|---|---|
| Pronghorn | Pinedale (#87), Piney (#89), and Yellow Point (#90) | 5,307 | 2,121 | 1,644 | 1,689 |
| Mule deer | Boulder (#138), Pinedale (#139), and South Piney (#143) | 8,511 | -- | 1,877 | 668 |
| Elk | South Piney (#94), Pinedale (#97), and Boulder (#98) | 19,105 | 1,320 | 2,983 | 915 |
| Moose | Pinedale - Off National Forest (#4), and Big Piney - Off National Forest (#25) | 405 | 90 | 91 | 78 |

Source: WGFD 2007b.

In addition to big game, there are several small animals and upland game birds that are permitted for hunting in the Project Area. Hunt Unit 3 and Hunt Unit 7, also known as Bridger and Eden, respectively, are located in the Project Area. Small animals and upland game birds hunted in these units include mourning dove (*Zenaida macroura*), Blue Grouse (*Dendragapus obscurus*), Ruffed Grouse (*Bonasa umbellus*), snowshoe hare (*Lepus americanus*), and cottontail rabbits (*Sylvilagus* spp.). In 2007, hunting licenses were also required for the Greater sage-grouse within these Hunt Units.

### 3.3.4 Visual Resources

The Project Area is in an undeveloped setting with an open and flat landscape typical of southwestern Wyoming, with distance views that are generally unimpeded by trees, tall structures, or other vertical landscape features. The landscape in the Project vicinity generally consists of open range vegetation with sagebrush and native grasses. The topography consists of low rolling hills with less than 10% slopes in the center of the Project Area and steep bluffs of approximately 50-foot rise along the margins of the floodplains of the New Fork River and the Green River in the northern portion of the Project Area. Buttes, mesas, rivers lined with trees, and agriculture provide variety in topography and color that contributes to the scenic quality of the area.

Distant views to the east include the Wind River Mountain Range. Distant views to the west include the Wyoming Range and Bridger-Teton National Forest. The Project Area can be viewed to the west from U.S. 191, which runs north/south along the east edge of the Project Area; from SH 351, which bisects the Project Area from east to west; and from U.S. 189, which runs north/south along the western edge of the Project Area. Highways within the Project Area are a gateway to scenic destinations such as the Grand Tetons, Yellowstone National Park, and the Green and Snake rivers. People may also view the area if using the unimproved dirt roads and two-track roads that provide access to ranches, well pads, industrial sites, and public lands used for recreation within the Project Area.

There is an existing high level of visual disturbance around the Jonah Gas Field and the Pinedale Anticline Area, consisting of gas wells, drilling pads, drilling rigs, reserve pits, compressors, industrial storage yards, and roads. Some areas along South Boulder Road, Paradise Road, and near Big Piney are developed with residential neighborhoods. Other existing visible structures include a single circuit 69-kV powerline along SH 351, Paradise Road, and U.S. 191, terminating at Sand Draw. However, much of the visual disturbance attributed to oil and gas development and structures is on private land and is not visible to the traveling, tourism-related public.

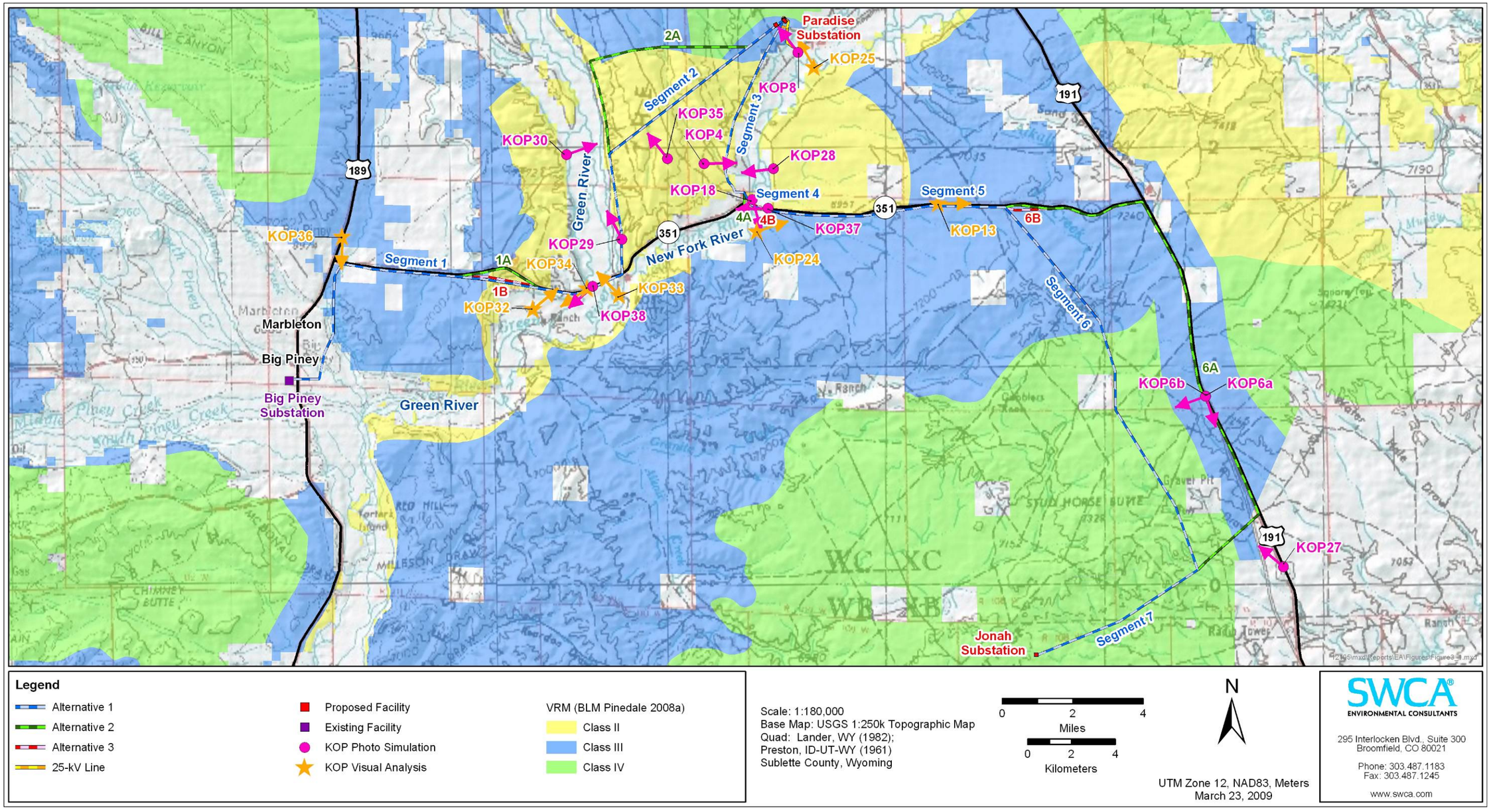
#### 3.3.4.1 Visual Resources Management

The BLM is responsible for managing public lands for multiple uses while ensuring that the scenic values and open space character of the public lands are considered before authorizing actions on public lands. The BLM accomplishes this through the Visual Resource Management (VRM) System. The VRM System classifies land based on visual appeal, public concern for scenic quality, and visibility from travel routes or observation points. The VRM classes are used to identify the degree of acceptable visual change within a landscape based on the physical and sociological characteristics: Classes I and II are the most valued; Class III represents a moderate value; and Class IV is of least value.

Within the Project Area and vicinity, Class II areas are found along the Green and New Fork rivers and their floodplains and along portions of the Lander Trail, also known as the Lander Cutoff or Lander Trail (Map 3-3). VRM Class III areas are generally found along highways, including U.S. 191 and U.S. 189, and SH 351. Developed areas such as the Jonah and Anticline gas fields are primarily Class IV. Based on BLM guidelines, Class II areas should retain the existing character of the landscape. Activities should not attract attention of the casual observer, and changes to the landscape should mimic the form, line, color, and texture of the natural landscape. Class III areas should partially retain the existing character of the landscape. Activities should not dominate the view, and changes should repeat the basic elements found in the predominant natural landscape features. Class IV areas allow major modifications to the existing character of the landscape. However, management of Class IV areas should attempt to minimize the impact of activities through careful location, minimal disturbance, and repeating the basic elements.

*Viewer/User Groups*

Travelers driving through the area would have temporary views of the Project Area. Passengers in moving vehicles would have greater opportunities for off-road views of the Project than would drivers. A majority of people using these roads are the hundreds of industrial employees accessing local oil and gas fields in the Project Area. Industrial users are expected to have a lesser level of sensitivity to changes in the landscape. Viewers also include local residents traveling to and from their homes, including homeowners in neighborhood developments and on ranches. Average daily traffic for the highways and major roads in the area are reported in Section 3.3.8, Transportation. Most residents are expected to be highly sensitive to changes in the landscape that can be viewed from their homes and neighborhoods and nearby recreation areas.




**Map 3-3. Visual Resource Management Areas within the Project Area.**

Forty-two percent of the population within Sublette County lives in the towns of Pinedale, Marbleton, and Big Piney; 58% live in smaller communities such as Bondurant, Boulder, Cora, and Daniel. Some powerlines are installed underground in newer subdivisions near Paradise Road to preserve the character of the landscape; however, electrical distribution lines occur along Paradise Road and the New Fork River, and an existing 69-kV powerline also occurs along the eastern side of the Green River floodplain, in sight of local residences.

Recreational users would also be highly sensitive to visual changes in the landscape. In the Project Area, recreation includes fishing and rafting on the New Fork and Green rivers, as well as visitors to the Lander Trail. Recreational users travel through the area along U.S. 191 to reach scenic destinations including the Bridger-Teton National Forest, Yellowstone National Park, and the Green and Snake rivers.

*Key Observation Points*

Key Observation Points (KOPs) represent the most critical viewpoints or typical views encountered in representative landscapes along the proposed route. Eighteen KOPs were identified along the proposed transmission line routes. Three of these are discussed below (see Photographs 3-1 through 3-4). All KOPs are discussed in Appendix E, the Visual Impact Assessment Report.

KOP 6 is located on U.S. 191 in VRM Class III and represents the current view drivers have when traveling south on the highway. U.S. 191 is a major corridor for tourism-related traffic and is also used by industrial workers and residents. KOP 6a looks west from the highway towards the Jonah Gas Gathering Field. KOP 18 is located on SH 351 along the New Fork River and represents the view of recreators on the river. KOP 28 is located in VRM Class II at a trail marker along Lander Trail near the New Fork River. This KOP represents the view of visitors to the historic trail as well as views from nearby residential neighborhoods.

The existing landscape viewed from KOP 6 is generally flat and dominated by the land-sky horizon, with very few contrasting elements in the landscape, such as rocks or outcrops, or variable trees or other contrasting vegetation. Existing features include open land vegetated with low growing sagebrush. There are no vertical structures. The existing landscape viewed from KOP 18 consists of the flat river bottom with blue reflective water, vegetated slopes of the river bank, and an existing bridge that creates a horizontal structure in the middleground. The existing landscape viewed from KOP 28 includes flat sagebrush in the foreground, a horizontal line of trees along the New Fork River in the middle ground, and rolling hills in the background.

**Photograph 3-1. KOP 6a. Existing view looking west from U.S. 191 (250° from north).**

**Photograph 3-2. KOP 6b. Existing view looking south along U.S. 191 (162° from north).**

**Photograph 3-3. KOP 18. Existing view from New Fork Campground looking south (164° from north).**

**Photograph 3-4. KOP 28. Existing view looking northwest across the New Fork River from the historic trail marker on South Boulder Road (263° from north).**

### 3.3.5 Cultural Resources

Cultural resources are the nonrenewable remains of past human activity. They are primarily managed pursuant to the National Historic Preservation Act of 1966 (NHPA) and the Archaeological Resources Protection Act of 1979 (ARPA). Additional statutes governing the preservation, use, and disposition of cultural resources include the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), EO 13007: Indian Sacred Sites, and EO 13287: Preserve America. In particular, the NHPA requires identification of significant cultural resources prior to a federal undertaking (36 CFR 800.4), and that federal agencies take into account the effects of those undertakings on historic properties (36 CFR 800.1). Furthermore, the Wyoming BLM has entered into an agreement with the Wyoming State Historic Preservation Office (SHPO) to implement a state Protocol (BLM and Wyoming SHPO 2006). The Wyoming Protocol supplements the National BLM Programmatic Agreement; these documents guide the Wyoming BLM and the Wyoming SHPO fulfillment of their requirements and responsibilities under Section 106; especially for the assessment of potential impacts to and guidance for the adequate mitigation of visual and direct impacts to cultural resources (BLM and Wyoming SHPO 2006:Appendix C).

#### 3.3.5.1 Area of Potential Effect

The straight-line length of the cultural resource study area stretches for approximately 94.05 miles along the proposed Project ROW (Segments 1 through 7 including all alternatives and all private lands). The APE for direct physical impacts along linear portions of the proposed undertaking is considered to be 300 feet and encompasses the construction corridor, for the length of the proposed overhead power alignment alternatives. The APE for direct physical impacts at the substation is a 40-acre block area centered around the proposed location. The APE for impacts to the viewshed of the Lander Trail is specifically defined in the RMP as 3 miles north of the Lander Trail and south of the Lander Trail to SH 351. The viewshed APE for cultural resources is extended to include previously identified, culturally/historically significant, and Native American traditionally significant sites which lie outside of the direct APE, but from which the proposed transmission line and substation development might be visible.

Areas of temporary construction ROW were identified in 2008 at the completion of the field inventories. The APE for these areas was identified as 100 feet beyond construction limits. No temporary construction ROW or use areas have received cultural resource inventory, except where they overlap the 2007–2008 cultural resource inventory corridor. These areas, as described in Section 2.1.1.2, will be identified as temporary use permits are applied for by project proponents, and will subsequently receive cultural resource inventory at that time.

#### 3.3.5.2 Cultural Resources Identification

Cultural resource inventories were conducted to identify cultural resources in the APE of the proposed Project and alternatives. Cultural resource inventories included a files search for known cultural resource locations in agency databases, followed by field inventories. The files reviewed included the Wyoming Cultural Resources Information System (WYCRIS) database of the Wyoming Cultural Resource Office (WYCRO), administered by the Wyoming SHPO, and the records of the BLM, which are the most up-to-date data sources for

the Project Area. The official files searches of the WYCRO were conducted on September 21, 2007 (WYCRO file search #20554) and September 4, 2008 (WYCRO file search #22699), and a files search was conducted at the office of the BLM-PFO on September 19, 2007. Additionally, the Government Land Office (GLO) plat maps and land patent records were also reviewed for all private land sections within the Project Area. The historic trails in the Project Area tend to be indentified on the 1983 plat maps. Field inventories followed database reviews, with qualified archaeologists inspecting the Project APE using three standard pedestrian transects at 30-meter intervals along and parallel to the Project centerline along the transmission line alternatives and in 40-acre survey blocks centered on the substations/substation alternatives.

Cultural resource inventories were conducted in 2007–2008, along Alternative 1 and potions of Alternative 2 alignments, and will continue through 2009 to cover areas excluded in the 2007 and 2008 field inventories. The areas excluded in the 2007–2008 inventories arose later in the Project planning process, and include:

- Alternates 1A, 2A, and 4A, (comprising approximately 25.74 miles of the Project length);
- some private land crossings where access permission was not received (see Table 3-17); and
- temporary use areas which remained unassigned.

Private lands, listed in Table 3-17, comprising approximately 2.88 miles of the Project length, did not yet grant permission for cultural resource inventories and therefore field access has not yet been obtained. These and additional temporary work areas (location to be determined) were only investigated through file searches. Cultural resource field inventories will be conducted on these lands with finalization of alternate selection in the EA process, with access obtained to all private lands, and on areas of temporary construction disturbance, and all significant cultural resource sites and appropriate protective measures will be identified prior to Project construction. Access to all private lands will necessarily be established prior to Project construction in order for the permanent ROW to be established.

**Table 3-17. Private Lands in the APE, Reviewed in File Searches but without Field Access.**

| Alternative Segment | Township (North) | Range (West) | Section Number | Miles of Project |
|---|---|---|---|---|
| 1 | 30 | 111 | east ½ of the southwest ¼ of the southeast ¼ of Section 31 | 0.13 |
| 2 | 30 | 110 | north ½ of the northeast ¼ of Section 21 and south ½ of Section 15 | 1.50 |
| 4 | 30 | 109 | northeast ¼ of Section 5 | 0.25 |
| 4A | 30 | 109 | northeast ¼ of Section 5 | 0.25 |
| 5 | 30 | 109 | southwest ¼ of the northwest ¼ of Section 4 | 0.25 |
| 6A | 30 | 107 | southeast ¼ of the southwest ¼ of Section 5 | 0.50 |
| **Total** | | | | **2.88** |

#### 3.3.5.3 Cultural History Context

The history and prehistory of the area, including culture-area contexts, historic period themes, and notable local historic and prehistoric sites, are described at length in the Cultural Resource Overview drafted for the Pinedale RMP (McNees et al. 2006). Most cultural resources identified in the Project Area are prehistoric sites, fitting the Project Area distribution patterns described in culture history contexts for the Jonah, Anticline South, The Mesa, and River cultural subregions as defined by McNees et al. 2006. Project segments and station facilities fit within identified cultural subregions as follows.

- River cultural subregion: Segments 1 and 1A (all); Segment 2 (west 1.5 miles); Segments 4 and 4A (all); and Segment 5 (west 0.25 mile)
- The Mesa cultural subregion: Paradise Substations A and B (all); Segment 2A (all); Segment 2 (all except west 1.5 miles); and Segment 3 (all)
- Anticline South cultural subregion: Segment 5 (all except west 0.25 mile); Segment 6 (all except south 2.5 miles); and Segment 6A (all except southwest 0.75 mile)
- Jonah cultural subregion: Segment 6 (south 2.5 miles); Segment 6A (southwest 0.75 mile); Segment 7 (all); and Jonah Substation (all)

Segment 7 and the Jonah Substation are adjacent to the Jonah cultural subregion in the BLM RSFO lands (McNees et al. 2006). The BLM RSFO has not explicitly defined cultural subregions within their field office boundaries like the PFO has. The locations of Segment 7 and the Jonah Substation are consistent with the qualities of the Jonah cultural subregion and for the purposes of this analysis will be considered part of that subregion. The north/south portions of Segments 2, 2A, and 3 parallel the River cultural subregion, just within the southern tip of The Mesa cultural subregion. The portion of Segment 6A that parallels the west side of U.S. 191 is just within the South Anticline cultural subregion; the east side of the highway is within the Squaretop Butte cultural subregion.

The EIS for the RMP states that the Jonah and South Anticline subregions are known for an abundance of archaeological sites associated with the Early Archaic period. These abundant prehistoric sites have frequently been found to contain buried archaeological features, including the remnants of pit houses. These buried cultural resources are most often associated with San Arcacio and San Arcacio-like soils (BLM 2007c). The Jonah subregion also contains an archeological district substantially comprised of Late Prehistoric period components (BLM 2007c).

The Mesa subregion tends to be dominated by Early Archaic components associated with the Opal phase timeframe (McNees et al. 2006). Overall, sites on The Mesa demonstrate a prominence of quartzite cobble-filled basin hearth features or the fire-cracked rock remains of features (McNees et al. 2006). The Mesa subregion, compared to the other cultural subregions, tends to more frequently contain sites sensitive to Native American tribes, including cairns, stone circles, and a number of burials in a distinctive context (BLM 2007c).

The River subregion has a propensity for rock alignment complexes on ridge and butte tops, for campsites, and for plant and game processing localities on river terraces. Some archaeological sites in the River subregion have been found to contain ceramics associated

with Late Prehistoric occupations, but no direct evidence of ceramic production has yet been documented. Paleoindian components occur more frequently at archaeological sites within the River subregion than many of the surrounding subregions in the BLM PFO area (BLM 2007c).

A majority of the sites within the APE are prehistoric camps exhibiting chipped stone artifacts and fire-cracked rock on their surfaces. Occasionally, hearth stains and/or charcoal are also visible on site surfaces. Ground stone is also present in the area. Stone circles, stone alignments, and other features—such as cairns—sensitive to traditional Native American cultures are mostly known to the south of the Green River from the Project Area, and west of the New Fork River crossing; only one stone circle site is known in the Project Area and the culturally sensitive Wardell Bison Trap site is north of the Green River, but south of the Project corridor.

After the prehistoric period, the early nineteenth century, the Upper Green River Valley became a significant center of historic fur trading activities. Then, in 1857, emigrants first traveled the Lander Trail through the Project Area on their way to California and Oregon. From that point, the Upper Green River Valley remained an important transportation corridor for reaching cattle markets and the establishment of ranches until the twentieth century (BLM 2007c). The River, The Mesa, and the Anticline South subregions are all crossed by the Lander Trail, now designated by Congress as part of the California National Trail System, significant because it facilitated the transcontinental settlement and western expansion of the United States. The River subregion was largely where ranch settlement occurred, while The Mesa, Anticline South, and Jonah subregions were largely unsettled rangelands, on the route of the Green River Drift (McNees et al. 2006). The Green River Drift is an historic cattle driveway used by local ranchers for over 100 years. The remnants of the drift include only a few historic line camps and debris scatters in the subregions, not central ranch complexes (McNees et al. 2006). Historic-era cairns and tin can scatters have also been found in the subregions. Historic sites known in the area tend to be either associated with ranching and livestock herding activities or with historic ditch and transportation routes. Historic transportation and ditch sites are the primary non-archaeological sites known in the Project Area.

#### 3.3.5.4 Cultural Resource Site Occurrence

Based on the results of the 2007–2008 cultural resources file search and field surveys, 90 cultural resource sites were identified in direct overlap of the physical impact APE and 1 archaeological site (the Wardell Bison Trap) does not have physical elements directly in the corridor, but its integral setting may be threatened. Of these, 73 were previously known and documented sites and 18 were sites newly identified and recorded for the current Project. Seventy-seven cultural resource sites are in the PFO area, 12 in the RSFO area, and 2 overlap both field office boundaries. Overall, 81 prehistoric and 12 historic components were identified, with multicomponent sites counting for both categories. Of the range of prehistoric components, 47 are represented by open camp sites (one with stone circles), 31 are represented by lithic scatter sites, 2 are lithic landscapes, and 1 is a bison trap. Of the historic components, two are historic debris scatters or herder camps, four are historic ditches, five are historic roads or trails (one with a telegraph line), and one has historic cairns. Historic trails and other historic properties, where setting is an integral component, may be adversely

affected by impacts to the physical remains of the trail as well as impacts to the trail's viewshed.

Management actions for cultural resources concerning the Lander Trail, in Section 2.3.2 of the BLM PFO RMP ROD, include the specification that "The Lander Trail and its visual historic setting will be protected through the establishment of a VRM Class II designation for about 71,510 acres of public land within 3 miles of contributing segments of the trail (Map 2-30)" (BLM 2008a:[2]11). The map indicated (Map 2-30) suggests that the areas of Class II designation intersecting both the Lander Trail and current Project segments are effective of Project Segments 1, 1A, and 2 in T30N, R110W; Segments 2 and 2A in T31N, R110W; Segments 2 and 3 in T31N, R109W; and Segments 4, 4A, and 5 in T30N, R109W. Although the north ends of Project Segments 6 and 6A are also within 3 miles of the Lander Trail, they are not within 3 miles of portions of the trail considered to be contributing to the historic site's significance by the RMP ROD, as the RMP ROD demonstrates on Map 3-01; the trail in these areas is in VRM Class III (BLM 2008a). VRM Class II includes intact trail portions on BLM lands from U.S. 191 west across the New Fork River and Green River corridors to approximately the Cottonwood Canal, before U.S. 189, then resuming again on BLM lands far to the west of U.S. 189. The VRM Class II area is not intended to include areas from SH 351 south (Personal communication from David Vlcek and David Crowley, BLM PFO, to Scott Phillips, SWCA, and Shawn Mahugh, GeoEngineers, February 4, 2009). VRM classifications are described in the visual resources section of this EA chapter.

Appendix 3 of the RMP ROD applies "Mitigation Guidelines and Operating Standards Applied to Surface Disturbing and Disruptive Activities" to all significant historic trails and roads, including the Opal and New Fork wagon roads, as well as the Lander Trail. The Cultural/Paleontological Resources section of that appendix states specifically, "Historic trails will be avoided. Surface disturbing activities will avoid areas within one-quarter mile of a trail unless such disturbance will not be visible from the trail or will occur in an existing visual intrusion area. Historic trails will not be used as haul roads. Placement of facilities outside one-quarter mile that are within view of the Lander Trail will be located to blend the site and facilities in with the background" (BLM 2008a:[A3]6).

In the direct Project APE, 55 sites occur across approximately 31.22 miles of proposed alternatives in the Anticline South cultural subregion, 20 across 8.41 miles in the Jonah cultural subregion, 11 across 26.10 miles in the River cultural subregion, and 11 across 28.32 miles in The Mesa cultural subregion, with the Lander Trail, the Yellow Point Ridge lithic landscape, the Paradise Ditch, and two prehistoric campsites crossing multiple cultural subregions. Site density for the Project Area is highest in the Jonah cultural subregion, second highest in the Anticline South cultural subregion, second lowest in the River cultural subregion, and lowest in The Mesa cultural subregion.

- Jonah cultural subregion: 1 site every 0.42 mile (1 every 15 acres)
- Anticline South cultural subregion: 1 site every 0.57 mile (1 every 21 acres)
- River cultural subregion: 1 site every 2.37 miles (1 every 87 acres)
- The Mesa cultural subregion: 1 site every 2.57 miles (1 every 93 acres)

This results in an average cultural resource density of approximately 1 site per every 0.97 mile (or per every 35 acres) of the 94.05-mile-long Project corridor with alternatives.

#### 3.3.5.5 Cultural Resource Constraints and Site Significance

Those sites within the APE for the Project that are determined to be significant or are considered sensitive to Native American concerns are of the greatest concern. Site significance is considered based upon evaluation of each cultural resource for its eligibility to be nominated to the National Register of Historic Places (NRHP). Significant cultural resources are those evaluated as Eligible for nomination to the NRHP. NRHP site significance is assessed with regard to the criteria in Title 36 CFR 60.4 (cf RMP ROD Appendix 1 page 2 [BLM 2008a]). Although Native American sites may not be eligible for the NRHP, they are still protected under other statues, including ARPA, NAGPRA, AIRFA, and EOs 13007 and 13287.

As summarized in Table 3-18, 31 sites within the APE have been recommended as Eligible for NRHP nomination. These include 19 prehistoric and 4 historic sites (but no multicomponent sites) that are considered to be significant and requiring some protective measures. The other 68 sites (60 prehistoric, 6 historic, and 2 multicomponent sites) in the Project APE have been recommended as Not Eligible for NRHP nomination or are considered destroyed.

**Table 3-18. Sites Eligible for Nomination to the NRHP, Listed by Project Segment.**

| Site Category: | Prehistoric | Historic | Total by Project Segment |
|---|---|---|---|
| Project Segment 1 | 1 | 2 | 3 |
| Project Segment 1A | 1 | 1 | 2 |
| Project Segment 2 | 0 | 2 | 2 |
| Project Segment 2A | 0 | 1 | 1 |
| Project Segment 3 | 0 | 1 | 1 |
| Project Segment 4 | 0 | 1 | 1 |
| Project Segment 4A | 0 | 1 | 1 |
| Project Segment 5 | 6 | 1 | 7 |
| Project Segment 6 | 6 | 0 | 6 |
| Project Segment 6A | 2 | 1 | 3 |
| Project Segment 7 | 4 | 0 | 4 |
| **Total Sites by Category*** | **20** | **11** | **31** |

*The setting of the Wardell Bison Trap may be impacted along both Segments 1 and 1A. Significant portions of the Lander Cutoff Trail are within proximity to or crossed directly by Segments 1, 1A, 2, 2A, 3, 4, 4A, and 5.

Regardless of proposed Project actions, sites that have been determined Not Eligible for the NRHP are generally recommended to need no further work. All sites within the APE will be revisited and evaluated for the accuracy of recording and eligibility for the NRHP and to verify the site's current status. Those archaeological sites that are determined to be significant due to their eligibility for NRHP nomination are generally to be avoided by direct project impacts during development, usually by moving planned project activities outside site

boundaries. If avoidance is not possible, more intrusive mitigation measures will be developed and implemented by way of a testing or data recovery plan approved by the Wyoming SHPO.

Historic properties or cultural resources significant for preservation, representation, and interpretation of important aspects of history, prehistory, or other qualities of cultural heritage, may require different treatment approaches. These sites may include historic roads and trails, such as the Lander Trail and the Opal and New Fork wagon roads, or sites of cultural importance to Native American tribes. In addition to avoidance of direct project impacts, the quality of the physical setting for these resources is considered, both in and outside of the direct path of project construction. Visual intrusion on the integral setting of these sites by features out of character with the original historic landscapes may be considered to diminish or destroy their historical, sacred, or sensitive qualities.

Sites of cultural sensitivity for Native American peoples, which may include stone circle sites or stone alignments and cairns, may require additional consultation by the BLM with the appropriate tribal government(s). The Wardell Bison Trap site has features of cultural sensitivity for Native American peoples that could be adversely affected by changes in setting as a result of the Project. Additionally, project development could adversely affect the setting to the point where it hinders attempts to have the Wardell Bison Trap designated as a National Historic Landmark and detracts from public visitation and interpretation of the site.

Several routes of three historic trails that are Eligible for nomination to the NRHP are located in the APE. Even though the historic linear feature may be Eligible for the NRHP, various routes may or may not contribute to that significance depending on the integrity of specific segments (cf RMP ROD Appendix 1 page 2 [BLM 2008a]). Only segments that are sufficiently intact to contribute to the overall eligibility of the historic linear site for nomination to the NRHP are considered to retain significance. Impacts to significant routes of historic linear sites can occur from direct disturbance of the route itself, or from disturbance of the setting if that setting is of import to the overall eligibility of the linear site. Impacts to the setting, if they cannot be avoided through project redesign, are frequently mitigated through off-site efforts, such as establishment of interpretive signage for the public.

The Lander Trail is proposed to be directly crossed by at least Segments 2 and 3 of the proposed Project, on the south-southeast side of the trail leading to the New Fork River, based on sesquicentennial trail mapping by The Lander Trail Foundation (The Lander Trail Foundation 2008). Project Segment 1 is proposed to directly cross the historic Opal Wagon Road route in two locations along the Muddy Creek drainage; however, both crossing locations have been previously recommended as not contributing to the eligibility of the site for NRHP nomination (Kail Consulting 2001), but without SHPO review according to the WYCRIS database. The historic New Fork Wagon Road route is proposed to be crossed by Segment 6A in a location where the site has been previously disturbed by later highway development and is also not contributing to the eligibility of the site for NRHP nomination.

Finally, due to the potential of some sediments in the area to contain buried cultural deposits not manifest on the surface, unexpected subsurface discoveries could occur during ground disturbance from project construction activities. San Arcacio and San Arcacio-like soils, dune

deposits, and aggraded alluvial terrace deposits have the potential to produce buried cultural materials from the Paleoindian through Historic periods. An approved discovery plan will need to be in place for unexpected discoveries in areas where blading and similarly extensive ground disturbance is proposed in these soil situations.

### 3.3.6 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed by President Clinton in 1994. The EO requires agencies to advance environmental justice by pursuing fair treatment and meaningful involvement of minority and low-income populations. Fair treatment means such groups should not bear a disproportionately high share of negative environmental consequences from federal programs, policies, decisions, or operations. Meaningful involvement means federal officials actively promote opportunities for public participation, and federal decisions can be materially affected by participating groups and individuals.

Tables 3-19 and 3-20 summarize relevant data regarding minority and low-income populations for the study area.

**Table 3-19. Minority Population Characteristics of Sublette County.**

| Ethnic Origin | 2000 | 2006 | 2006 Percentage of Total Population* |
|---|---|---|---|
| White Alone | 5,811 | 7,207 | 97.9 |
| African American | 12 | 16 | 0.21 |
| Native American/Native Alaskan | 31 | 49 | 0.66 |
| Asian | 15 | 22 | 0.29 |
| Native Hawaiian/Pacific Islander | 5 | 5 | 0.06 |
| Two or More Races | 46 | 60 | 0.81 |
| Total Population | 5,920 | 7,359 | 100.3 |

Source: U.S. Census Bureau 2008.
*Numbers may not add up due to rounding.
Hispanics can be of any race and are included in this analysis.

**Table 3-20. Poverty Characteristics of Sublette County as Compared to the State of Wyoming.**

| Location | 2000 | 2005 |
|---|---|---|
| Sublette County Poverty Rate | 9.7% | 7.2% |
| Minority Population | 1.82% | 2.07% |
| State of Wyoming Poverty Rate | 11.4% | 10.3% |

Source: U.S. Census Bureau 2000.

#### 3.3.6.1 Minority Populations

Minority population data for the State of Wyoming and Sublette County was obtained from the State Department of Administration and Economic Analysis Division and the U.S. Census Bureau, respectively. The latest available data for Wyoming is from 2007 and for Sublette County is from 2006.

As of July 2007, Wyoming's total minority population comprised approximately 66,263 or 12.7% of the state's total population. This is an increase of approximately 23.7% since the 2000 minority population, compared with the 5.9% overall increase for the state's total population. The minority population contributed to over 40% of the state's population growth from 2000 to 2007. According to the State of Wyoming, Hispanic was the largest minority group with 38,409 residents in July 2007, which increased 21.3% since 2000. All other races, including African American, Native American, Asian, and mixed races, recorded double-digit growth, while the majority, Non-Hispanic White, increased at 3.7%. With 12.7% of the state's total population, the proportion of minorities in Wyoming was ranked the ninth lowest in the nation, compared to about one in three minority residents in the United States (State of Wyoming 2008d).

Ethnic diversity is limited in Sublette County with White, Non-Hispanic residents comprising approximately 97.9% of the population (Table 3-19). Other ethnicities include African American (0.21%), Native American/Alaskan (0.66%), Asian (0.29%), Native Hawaiian/Pacific Islander (0.06%), and two or more races (0.81%) (U.S. Census Bureau 2008).

#### 3.3.6.2 Poverty Rates

The analysis of potential environmental justice issues associated with the proposed transmission line followed guidelines described in the CEQ's Environmental Justice Guidance under the National Environmental Policy Act (CEQ 1997).

The most recent data on household income broken down by race was obtained from the U.S. Census Bureau 2000 census. Compared to other counties throughout the nation, Sublette County had a medium-high median income for all households of $45,681 (adjusted to 2005 Dollars). This figure is 2.9% higher than the median in Wyoming of $44,334, but 7.6% lower than the median for the rest of the nation, which is a reported $49,133. Compared to other counties throughout the United States, Sublette County can be considered to have a medium-low poverty rate amid the residents with a poverty rate of 9.7% of people living in a family with an income below the poverty level in 1999.

According to the 2000 census, African American heads of households reported a median household income that was 88.3% less than the overall reported level in 2000, with a reported median of $5,362. The American Indian and Alaska Native headed households in Sublette County had a median income of $41,681, which was 8.8% less than the area's median level for all households. Asian headed households in the area have median household incomes of $19,013. This median is 58.4% less than the reported median household income for all households in the area. Hispanic households had a median household income of approximately $25,837, which is 43.4% less than reported value of the area's total household median income for all households (U.S. Census Bureau 2000).

Because the economic base of the study area is largely rural agriculture and resource extraction, low-income areas are dispersed within the study area. People within the poverty status may reside within the study area, but not disproportionately.

### 3.3.7 Fire Management

Wildland fires are often ignited by natural sources such as lightning, but may also be ignited by human causes. Human-caused ignitions may be started by cigarettes, fireworks, woodcutting, campfires, downed powerlines, or equipment use and arson. Prescribed fires are management-ignited fires that are used to restore fire to the ecosystem, reduce fuel loadings, or to achieve resource objectives. Fire occurrences within and surrounding the PFO have most typically occurred on U.S. Forest Service (USFS) lands in the forested higher elevations.

The Southwestern Wyoming Fire Management Zone includes the Kemmerer Field Office, PFO, and RSFO. The majority of the Project Area is located within the Mesa South Desert Fire Management Unit (FMU) of the PFO. The fire management objectives of this FMU are to provide for human health and safety, maintain or improve wildlife habitat and livestock forage, restore vegetative communities by reducing conifer and sagebrush encroachment, protect cultural resources, reduce hazardous fuels in and around the wildland urban interface, protect and manage for wilderness characteristics and values, and return ecosystems to their natural fire regime (BLM 2004). A fire regime is defined as the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993; Brown 1995).

Approximately 5 miles of the southern portion of the proposed Project, including the proposed Jonah Substation, is located within the Big Sandy and Steamboat Mountain FMU of the RSFO which has similar objectives to those of the Mesa South Desert FMU. Practices followed by the fire management program of the BLM PFO include suppression, wildland fires for resource benefit, prescribed fire, and mechanical fuels reduction projects.

Lightning ignitions account for the majority of the fire occurrences in the Mesa South Desert FMU. The most likely causes of human-caused ignitions would be from recreational users and industrial operations. Other wildfire hazards in the Southwestern Fire Management Zone include exposed coal seams, powerlines, oil and gas facilities, abandoned mines, and hydrogen sulfide gas. From 1980 to 2003, approximately 12 fires occurred within this FMU, accounting for 16.8 total acres burned which represents an average of 1.4 acres per fire, and an average of 0.7 acre burned per year (BLM 2004). The fire season typically begins in late May or early July and lasts through September or October depending on weather conditions.

The climate is semiarid with dry and sunny conditions and a wide diurnal temperature range. Maximum temperatures for the FMU rarely exceed 90 to 100 °F during the fire season. The region receives precipitation in the form of both rainfall and snow. Throughout the summer months, lightning storms occur with wetting rains. The average annual precipitation is 7 to 8 inches (WRCC 2008). Winds are primarily out of the west. Humidity during the fire season ranges from about 25 to 30%, but can be as low as 5 to 10% (Wyoming State Climate Office 2008).

Overall, the topography within the region is characterized by rolling hills throughout the majority of the Project Area with bluffs and floodplains along the Green and New Fork rivers. The dominant vegetation in the FMU includes big sagebrush; salt desert shrub; mixed grassland; forest dominated riparian areas and wetlands; and Rock Outcrop/Bare Ground

(BLM 2007a). According to available vegetation mapping, Wyoming big sagebrush is the dominant shrub in the Project Area. Several other species of sagebrush, as well as rabbitbrush, saltbush, greasewood, and broom snakeweed (*Gutierrezia sarothrae*) are also common in the shrub communities.

The historical fire return interval for Wyoming big sagebrush is 10 to 70 years. For riparian areas containing stands of cottonwood, the historical fire return interval is greater than 100 years. Sagebrush, which has a natural fire regime of stand replacing or mixed fire severity fire (fire regime classifications II and III) covers the largest percentage of the Project Area.

Potential wildfire hazards from the proposed Project would be low to moderate throughout most of the year, but would have the potential to be high or extreme during other times of the year. Fire danger is likely to be higher during the summer months, but would also depend on vegetation and climatic conditions. Wildfire hazard varies depending on the vegetative community, seasonal drought conditions, and plant growth stages in these fuel types. During the spring green-up, grasses, sagebrush, and other brush species have high fuel moistures and are relatively resistant to ignition and fire spread. Later in the season when grasses are cured and during years of drought conditions, the risk that a fire will ignite and grow is much greater. Weather and topography also play a significant role as low relative humidity, high winds, and steep slopes can cause a fire to spread at a fast rate once ignited.

Communities at risk of wildfires within the proposed Project corridor are primarily associated with the towns of Big Piney and Marbleton along the western edge of Section 1 and along the Green River. The majority of the land within the Project Area is public land; however, there are some scattered private residences intermixed with BLM land.

### 3.3.8 Transportation

The Project Area is crossed by three principal travel corridors, in addition to numerous secondary and local/collector roads. Principal highways include 1) U.S. 191, which is located east of the Project Area and is the primary north-south travel artery between Rock Springs and Pinedale; 2) SH 351, an east-west roadway that parallels the western portion of the Project Area and connects U.S. 191 to U.S. 189 north of Marbleton; and 3) U.S. 189, which is located along the western terminus of the Project Area and is the primary north-south travel artery between U.S. 189 west of Pinedale and La Barge. Access to portions of the Project Area would occur along numerous secondary and local/collector roads.

The southeastern terminus of the Project Area is crossed by Luman Road (BLM Road 5409) which extends east from the Project corridor to U.S. 191 and southwest to Burma Road. The southeastern terminus of the Project corridor is located approximately 2 miles east of the Luman Road/Burma Road (BLM Road 5406) intersection. The Project Area parallels U.S. 191 within approximately 2 to 4 miles west of its travel corridor to the north from its intersection with Luman Road to SH 351. Along this stretch, it crosses several primary and secondary roads, including South Anticline Crest Road, Speedway Road, and Blue Rim Road. At the U.S. 191/SH 351 intersection, the Project Area heads west and parallels the SH 351 travel corridor.

The Project Area leaves the SH 351 travel corridor at its intersection with Paradise Road and The Mesa Road on the western side of the New Fork River. Between U.S. 191 and Paradise Road, the Project Area crosses several secondary and local/collector roads, including Blue Rim Road, Jonah North Road (BLM Road 5410), Middle Crest Road, Burma Road, Yellow Point Road, Boulder South Road (County Road [CR] 106), and Paradise Road (CR 136). North of SH 351, the Project Area parallels the New Fork River corridor and Paradise Road, to the proposed Paradise Substation.

From the proposed substation, the Project Area heads southwest toward the Green River, crossing the Mesa Road. Just east of the Green River, the Project corridor heads south along East Green River Road and passes Luman Lane, Marincic Road, and New Fork Bridge Road to its junction with SH 351. The Project Area travels west along the SH 351 travel corridor to its intersection with U.S. 189, passing Chapel Road and Reservoir Road. At U.S. 189, the Project Area heads directly south, within 1 to 2 miles of the eastern side of U.S. 189 and passes Big Piney Airport Road and remains east of the eastern limits of the town of Marbleton (Red Hill Avenue). The western terminus of the Project Area is located at the existing Big Piney Substation immediately west of the U.S. 189 (Front Street)/ Quealy Avenue intersection in the town of Big Piney.

Traffic volumes vary greatly along the various roads that surround or pass through the Project Area. All of the primary highways have experienced a consistent increase in average daily traffic (ADT) since 2000 (BLM 2008b). Table 3-21 provides ADT recorded at traffic counter stations along all three primary highways within the Project Area.

Similar patterns are evident along secondary and local/collector roads surrounding the Project Area. Traffic volumes along the Jonah North Road, which intersects Luman Road northeast of the Core Area, experienced an increase in traffic volume between mid-March through mid-May from 2001 (59 axles per day) to 2004 (257 axles per day) (BLM 2007c). In addition, approximate ADT along Luman Road, one of four primary access routes to the JIDPA, is expected to contribute an additional 312 to 610 vehicles per day as a result of operations with that project (BLM 2006). Existing vehicular traffic along secondary and local/collector roads includes energy exploration and development activities, residential and business travel, livestock operations, and recreational activities. Table 3-22 provides the ADT recorded along secondary and local/collector roads within the Project Area.

**Table 3-21. 2006 Average Daily Traffic (ADT) along Primary Highways within the Project Area.**

| Station | Milepost | ADT |
|---|---|---|
| **U.S. 191** | | |
| Sweetwater/Sublette County Line | 51.62 | 3,340 |
| Jct. Speedway Road | 72.81 | 2,830 |
| Jct. SH 351 | 75.75 | 2,280 |
| **SH 351** | | |
| Jct. U.S. 191 | 0 | 2,230 |
| Jct. County Road 136 North | 12.91 | 1,620 |
| Jct. U.S. 189 | 0 | 550 |
| **U.S. 189** | | |
| Jct. SH 351 | 109.38 | 1,430 |
| Jct. Airport Road | 107.97 | 4,070 |
| Marbleton North Corp. Limits | 107.47 | 4,520 |
| Marbleton South Corp. Limits | 106.93 | 5,000 |
| Big Piney North Corp. Limits | 106.32 | 6,190 |
| Jct. SH 350 | 105.94 | 5,930 |
| Big Piney South Corp. Limits | 105.81 | 4,180 |

**Table 3-22. Minimum Average Daily Traffic (ADT) along Secondary and Local/ Collector Roads within the Project Area.**

| Road | ADT |
|---|---|
| Luman Road | 312–610[1] |
| Jonah North Road | 128[2] |
| Paradise Road | 506[3] |
| Mesa Road | 11[4] |

[1] predicted ADT volume associated with JIDP activities, which does not include non-JIDP vehicular activity; BLM 2006

[2] 2004 ADT; BLM 2008a

[3] 2006 ADT; recorded along North Anticline Road 0.62 mile north of its intersection with Paradise Road (assumes all traffic was using Paradise Road); BLM 2008a

[4] 2002 ADT; BLM 2008a

# 4.0 ENVIRONMENTAL CONSEQUENCES

## 4.1 NATURAL ENVIRONMENT

### 4.1.1 Soils

#### 4.1.1.1 Impact Criteria

Based on management objectives of the Pinedale RMP ROD, impact indicators for soils include destabilizing soil layers, accelerated erosion, and chemical degradation of the soil resource. Most soils in the Project Area have a high erosion potential and generally limited rehabilitation potential because of thin soils, shallow depth to bedrock, excess salts, excess sand and/or small stones, clayey textures, and excess lime. Impacts to soils would be considered significant if a reduction in soil productivity and/or increased erosion would prevent successful reclamation or if soil disturbance or other activities resulted in a violation of the land use objectives identified in the Pinedale RMP ROD (BLM 2008a). Potential direct impacts to Project Area soils would result from the exposure and disturbance of in-place soils, and any resulting short-term and long-term loss of topsoil, soil compaction, and increased susceptibility to wind and water erosion. Increased surface runoff and erosion would occur primarily in the short term and would decline in time due to natural stabilization through particle aggregation, soil structure development, and armoring.

Direct impacts would result from mechanical grading and leveling of soil. Indirect impacts to soils may result from crushing of vegetation by heavy equipment. Impacts to soils are assumed to be proportional to the amount of new surface disturbance including vegetation crushing. Potential impacts, both directly from ground disturbances and indirectly from vegetation crushing, would be more pronounced in areas of steeper slopes. Direct and indirect adverse impacts to soil resources can typically be reduced to below a level of significance through the implementation of effective mitigation measures.

#### 4.1.1.2 No Action Alternative

Under the No Action Alternative, no additional disturbance/development beyond that which has already been authorized by the BLM would occur. Impacts to soil resources within the proposed Project Area would continue at current rates, being affected primarily by ongoing oil and gas activity and livestock grazing.

#### 4.1.1.3 Alternative 1

Alternative 1 would consist of installing Segments 1 through 7 as well as constructing the Paradise and Jonah Substations. Under Alternative 1, no new roadways would be created along or within the proposed transmission line ROW. Existing roadways adjacent to or paralleling the proposed transmission line ROW would be used to the greatest extent possible to minimize potential disturbances to soils. Several categories of surface disturbance have been identified for the Project Area, shown in Appendix A, ranging from long-term disturbance from installation of industrial facilities, to driving over vegetation during access along the ROW. Table 4-1 summarizes the acreage totals for each soil group as it pertains to each segment of the action alternatives.

**Table 4-1. Estimated Disturbance in Soil Types, by Alternative.**

| Project Segment | Soil Types | Alt. 1 Disturbance (acres) | Alt. 2 Disturbance (acres) | Alt. 3 Disturbance (acres) |
|---|---|---|---|---|
| 1 | SUO1 | 60.72 | 60.72 | 60.72 |
| | SUO2 | 41.49 | 38.37 | 41.07 |
| | SUO5 | 42.29 | 48.05 | 43.00 |
| | SUO6 | 39.55 | 39.55 | 39.55 |
| | SUO9 | 0.80 | 0.80 | 0.80 |
| | **Segment Total** | **184.85** | **187.49** | **185.14** |
| 2 | SUO1 | 28.67 | 28.67 | 28.67 |
| | SUO2 | 7.62 | 32.19 | 7.62 |
| | SUO5 | 134.07 | 143.14 | 134.23 |
| | SUO6 | 17.03 | 20.76 | 17.03 |
| | **Segment Total** | **187.39** | **224.76** | **187.55** |
| Paradise Substation and 25-kV distribution | SUO1 | 7.29 | 7.29 | 7.29 |
| | SUO2 | 2.20 | 2.20 | 2.20 |
| | SUO5 | 21.52 | 20.97 | 20.27 |
| | **Substation and Distribution Line Total** | **31.01** | **30.46** | **29.76** |
| 3 | SUO1 | 89.16 | NA | NA |
| | SUO5 | NA | 90.83 | 89.49 |
| | **Segment Total** | **89.16** | **90.83** | **89.49** |
| 4 | SUO1 | 15.90 | 19.43 | 19.98 |
| | SUO2 | NA | NA | 0.19 |
| | SUO5 | 3.12 | 3.12 | 5.05 |
| | **Segment Total** | **19.02** | **22.55** | **25.22** |
| 5 | SUO1 | 45.13 | 45.13 | 42.57 |
| | SUO2 | 0.55 | 0.55 | NA |
| | SUO5 | 70.61 | 70.61 | 69.13 |
| | **Segment Total** | **116.29** | **116.29** | **111.70** |
| 6 | SUO3 | 7.26 | NA | NA |
| | SUO5 | 195.54 | 271.25 | 271.25 |
| | **Segment Total** | **202.80** | **271.25** | **271.25** |
| 7 | SOU03 | 37.44 | 37.44 | 37.44 |
| | SOU05 | 50.33 | 50.33 | 50.33 |
| | **Segment Total** | **87.77** | **87.77** | **87.77** |
| Jonah Substation | SOU03 | 7.00 | 7.00 | 7.00 |
| Pulling and Tension Sites outside of 150-foot ROW | SOU01 | 32.91 | 33.00 | 32.91 |
| | SOU02 | 10.11 | 6.04 | 10.11 |
| | SOU05 | 31.36 | 52.84 | 32.29 |
| | **Total** | **74.38** | **91.88** | **75.31** |

| Project Segment | Soil Types | Alt. 1 Disturbance (acres) | Alt. 2 Disturbance (acres) | Alt. 3 Disturbance (acres) |
|---|---|---|---|---|
| **Temporary** | **Total (acres) Soil Disturbance*** | **999.67** | **1,130.28** | **1,070.19** |
| **Long-term** | **Total (acres) Soil Disturbance*** | **80.61** | **88.69** | **85.90** |

* Detailed calculations provided in Appendix A

Short-term impacts to soils with Alternative 1 would include direct construction disturbance and mixing of soil resulting in approximately 999.67 acres of total soil disturbance, as shown in Table 4-1 and detailed in Appendix A. The majority of the surface disturbance would crush vegetation, but leave vegetative root systems intact to facilitate rapid recovery of vegetative cover. Areas where temporary grading and vegetation removal is required would be reclaimed per BLM mitigation guidelines. Under Alternative 1, all temporary soil-disturbing activities would be subject to an approved Stormwater Pollution Prevention Plan and Interim Reclamation Plan. The duration of the construction phase is estimated to be approximately nine months, and would be followed immediately by interim reclamation and soil stabilization. Some increased soil loss through erosion would be unavoidable under all of the alternatives, but would not be significant. The short-term direct and indirect impact to soil is considered minor and could be mitigated with construction Best Management Practices (BMPs).

Alternative 1 would include long-term direct impacts to soils from substations, an informal two-track road, and transmission structures, amounting to 80.61 acres. The long-term impact to soils in the Project Area from the permanent siting of these facilities would be considered minor.

#### 4.1.1.4 Alternative 2

As shown in Table 4-1, Alternative 2 includes different alignments of the transmission line in Project Segments 1, 2, 4, and 6. Appendix A identifies the detailed surface disturbance calculations for Alternative 2. Short-term direct and indirect impacts would result from a total of 1,130.28 acres of soil disturbance during the construction phase. The short-term impact to soils in Alternative 2 would include some minor impacts from compaction and disturbance in areas with thin topsoils, and disturbance in Segment 2 where slopes may be greater than 15%. The short-term impact to soils in Alternative 2 is considered minor and could be mitigated with construction BMPs.

Long-term impacts to soils in Alternative 2 would include the residual disturbance in areas where permanent substation facilities and transmission structures are sited. The total area of long-term soil disturbance was 88.69 acres with Alternative 2, the highest long-term effect of the Action Alternatives. Since most of the long-term impact to soils is the result of informal and unauthorized OHV use, long-term erosion may occur in some areas.

#### 4.1.1.5 Alternative 3

As shown in Table 4-1 and Appendix A, Alternative 3 would result in short-term direct and indirect impacts to a total of 1,070.19 acres of soil. The alternative includes different transmission line alignment for Segments 1, 4, 6, and the Paradise Substation and 25-kV distribution line. The short-term impact to soils in Alternative 3 is considered minor and could be mitigated with construction BMPs.

Long-term impacts to soils in Alternative 3 would include the residual disturbance in areas where permanent substation facilities and transmission structures are sited. The total area of long-term soil disturbance would be 85.90 acres. As with the other action alternatives, the long-term impact to soils is the result of informal and unauthorized OHV use, and long-term erosion may occur in some areas.

#### 4.1.1.6 Cumulative Impacts

Soil resources in the Project Area are affected by past, existing, and future development both within and outside of the Project Area boundary. The study area for cumulative impacts includes overlapping projects (i.e., JIDPA, PAPA, and NPL) within and surrounding the Project Area. Existing activities in this area include historical and ongoing oil and gas development, ranching and grazing, and any proposed or reasonably foreseeable developments and activities. These activities have all contributed to the removal of native vegetation and disturbance of soils. Project actions, combined with other surface-disturbing activities currently proposed for the region, would contribute incrementally to soil resource impacts including mixing of soil horizons, soil compaction, increased susceptibility of the soils to wind and water erosion, and contamination of soils with petroleum products or other chemicals.

Adverse impacts to soils from oil and gas development in the study area have occurred as a result of past and ongoing development in the JIDPA, PAPA, and NPL project areas. The Project would result in short-term disturbance to soils under all action alternatives. Interim reclamation would take place immediately following construction, and therefore the short-term effects of the Project would not result in adverse cumulative impacts to soils.

Long-term surface disturbance would result in indirect effects to soils, and primarily from unauthorized off-road vehicle use of the transmission ROW following project construction and reclamation. BLM anticipates that such unauthorized use would result in a two-track road in some areas. This would contribute incremental indirect impacts of up to 80.61 acres of long term disturbance to soils for Alternative 1, 88.69 acres of disturbance to soils for Alternative 2, and 85.9 acres of disturbance to soils for Alternative 3, mostly in the New Fork River watershed.

While these impacts represent only 0.001 percent of the approximately 802,000-acre New Fork River Drainage, the indirect impacts to soils add would add incrementally to other long-term soil disturbance in the Project Area and may result in long-term adverse cumulative impacts to soils without implementation of mitigation measures. Appropriate mitigation measures should be followed to limit the amount of soil disturbance during construction and maintenance activities as well as during the operational phase of the cumulative actions in the

Project Area. With mitigation and BMPs, the Project would not result in significant long-term cumulative impacts.

#### 4.1.1.7 Mitigation Opportunities

Under the various alternatives, Operators would implement management requirements and mitigation measures; therefore, impacts to soils would also be dependent on the effectiveness of this mitigation. These mitigation measures are based on the 2008 Pinedale RMP Appendix 3 (BLM 2008a).

To reduce impacts from uncontrolled long-term soil disturbance, BLM would monitor the Project ROW for any signs of unauthorized surface disturbance, and notify Rocky Mountain Power of the need for prompt erosion control and reclamation to control sediment transport to stream systems.

Implementation of these measures would minimize potential impacts to soil resources as a result of project construction, protect surface water quality, and promote the revegetation of disturbed areas.

### 4.1.2 Paleontological Resources

#### 4.1.2.1 Impact Criteria

The PFO RMP ROD has developed management objectives designed to protect significant fossils and known paleontological resources from damage or destruction and facilitate suitable scientific, educational, and recreational uses of fossils (BLM 2008a). According to the RMP, paleontological sites will be protected by using surface and subsurface protection stipulations and discretionary management authority.

Direct adverse impacts on paleontological resources would occur from the potential destruction of non-renewable paleontological resources and the loss of information associated with these resources. In general, the potential for direct impacts on paleontological resources increases with and is proportionate to ground-disturbing activities located in paleontologically sensitive geographic areas and geologic units. If potentially fossiliferous bedrock or surficial sediments are mechanically disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information (adverse impact). Construction of the proposed transmission line is anticipated to result in bedrock disturbance during substation construction and auger holes for both the H-frame poles and steel monopoles, as well as construction of the pulling and tensioning pads. These activities would produce adverse direct impacts to the extent that important paleontological resources would be destroyed.

Short-term indirect impacts to paleontological resources would result from vegetation crushing activities during construction. Such effects would occur during construction as the underlying surface deposit is abraded, and are considered generally minor. Long-term indirect impacts would include the unlawful or unauthorized collection of fossil remains.

Direct and indirect impacts to potentially fossiliferous geological sediments can typically be reduced to below a level of significance through the implementation of paleontological mitigation.

Table 4-2 summarizes the geology, paleontological sensitivity, and acreage of each geologic unit underlying each segment and alternative. Map 4-1 illustrates the paleontological sensitivity along the APE, based on the PFYC system.

#### 4.1.2.2 No Action Alternative

There would be no new impacts on paleontological resources if the high voltage transmission line is not built.

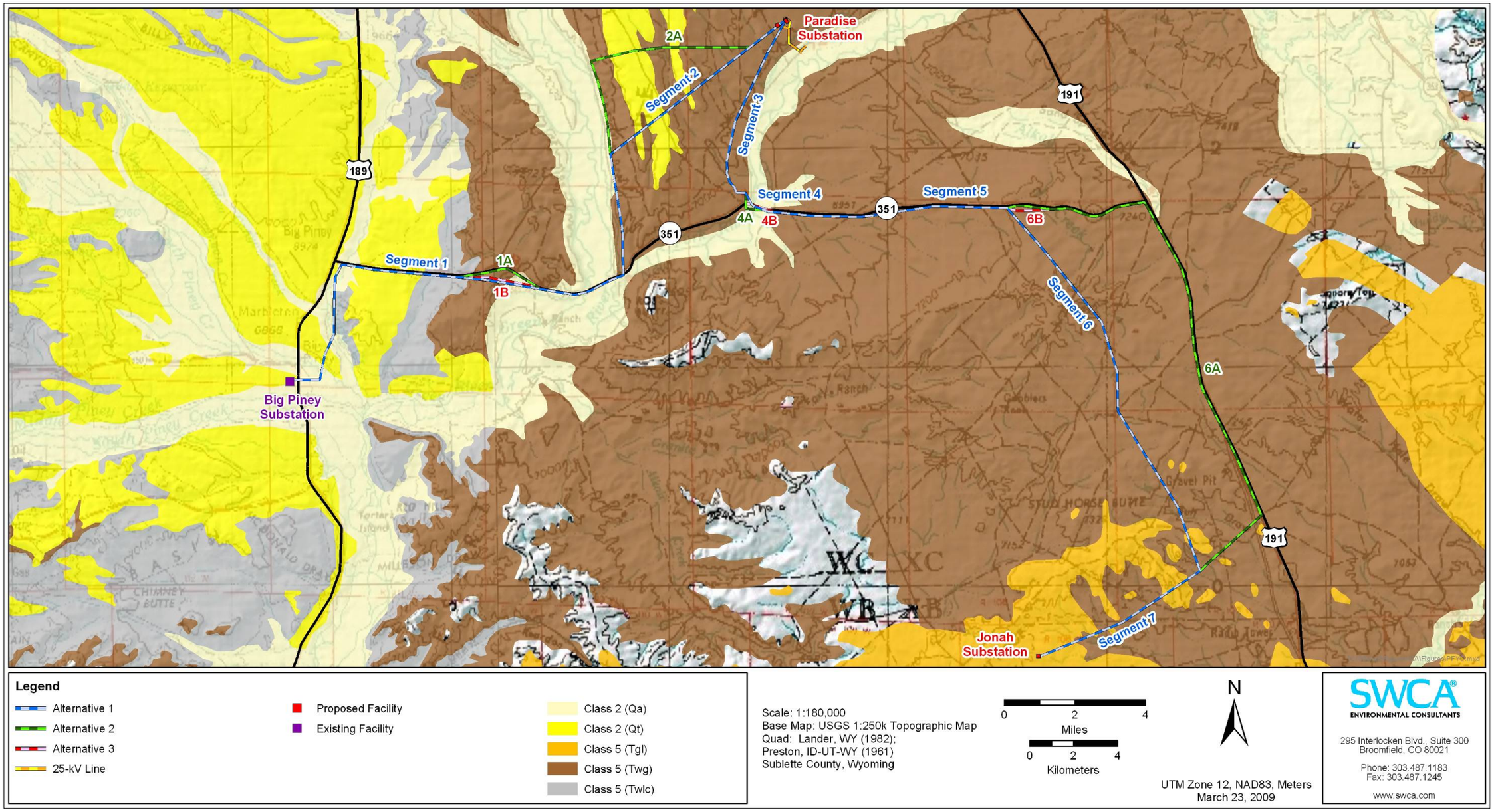
#### 4.1.2.3 Alternative 1

Alternative 1 would consist of Segments 1 through 7 and the Jonah and Paradise substations, and pulling and tensioning pads. Cumulatively, the APE for the Proposed Action is underlain by approximately 259.3 acres of Class 2 geologic units and 740.4 acres of Class 5 geologic units. The segment breakdown by geologic unit is provided in Table 4-2.

In the absence of mitigation, direct adverse impacts would be anticipated to paleontological resources from implementation of Alternative 1. The level of direct adverse impacts would be proportional to the acres of disturbance in areas with sensitive paleontological resources, as shown in Table 4-2. Some level of adverse impact to paleontological resources would be anticipated for all segments, but the intensity of impacts would increase with the area underlain by Class 5 resources.

Seventeen previously recorded fossil localities occur within 1 mile of Segment 6. Specific formational data as well as fossil type is not available. However, the presence of these localities, combined with the known sensitivity of the Green River and Wasatch formations, indicates that subsurface disturbance during construction and augering for pole placement has the potential to adversely impact fossil remains anywhere along Segment 6 since it is entirely underlain by PFYC Class 5 units. For example, an approximately 1-mile-long fossil fish locality was discovered during the construction for a subsurface pipeline in Section 20, T29N, R107W. However, because most of the route is vegetated, surface and shallow subsurface disturbance is unlikely to significantly impact paleontological resources for the vegetated portions of the route. Surface and subsurface disturbance along the sparsely vegetated badlands portions of Segment 6 does have the potential to adversely impact fossil remains.

Seven previously recorded localities occur within 1 mile of Segment 5 and three localities occur within 1 mile of Segment 7. The presence of these localities, combined with the known sensitivity of the Green River and Wasatch formations, indicates that subsurface disturbance has the potential to adversely impact fossil remains along the portions of Segments 1 through 5 and 7 that are underlain by PFYC Class 5 geologic units. However, because most of these segments are vegetated, surface and shallow subsurface disturbance would be unlikely to significantly impact paleontological resources along the vegetated portions of the segments.




**Map 4-1. PFYC within the Project Area.**

**Table 4-2. Comparison of Estimated Disturbance on Paleontologically Sensitive Geologic Units Underlying the APE for the Action Alternatives.**

| Project Segment | Geologic Unit | PFYC System | Acres Underlying APE for Alt. 1 | Acres Underlying APE for Alt. 2 | Acres Underlying APE for Alt. 3 |
|---|---|---|---|---|---|
| 1 | Gravel, pediment, and fan deposits | Class 2 | 41.48 | 41.48 | 41.48 |
| | Alluvium and colluvium | Class 2 | 101.05 | 97.92 | 100.63 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 17.19 | 48.09 | 17.38 |
| | La Barge and Chappo members of the Wasatch Formation | Class 5 | 25.13 | NA | 25.66 |
| | **Segment Total** | | **184.85** | **187.49** | **185.15** |
| 2 | Gravel, pediment, and fan deposits | Class 2 | 17.00 | 20.76 | 17.00 |
| | Alluvium and colluvium | Class 2 | 32.30 | 56.87 | 32.30 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 138.10 | 147.13 | 138.25 |
| | **Segment Total** | | **187.40** | **224.76** | **187.55** |
| Paradise Substation and 25-kV line | Alluvium and colluvium | Class 2 | 9.48 | 9.48 | 9.48 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 21.52 | 20.98 | 20.27 |
| | **Segment Total** | | **31.00** | **30.46** | **29.75** |
| 3 | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 89.16 | 90.83 | 89.49 |
| | **Segment Total** | | **89.16** | **90.83** | **89.49** |
| 4 | Alluvium and colluvium | Class 2 | 11.89 | 10.39 | 12.73 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 7.13 | 12.15 | 12.50 |
| | **Segment Total** | | **19.02** | **22.54** | **25.23** |

| Project Segment | Geologic Unit | PFYC System | Acres Underlying APE for Alt. 1 | Acres Underlying APE for Alt. 2 | Acres Underlying APE for Alt. 3 |
|---|---|---|---|---|---|
| 5 | Alluvium and colluvium | Class 2 | 3.11 | 3.11 | NA |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 113.18 | 113.18 | 111.70 |
| | **Segment Total** | | **116.29** | **116.29** | **111.70** |
| 6 | Laney Member of the Green River Formation | Class 5 | 7.26 | NA | NA |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 195.54 | 271.25 | 271.25 |
| | **Segment Total** | | **202.80** | **271.25** | **271.25** |
| 7 | Laney Member of the Green River Formation | Class 5 | 37.44 | 37.44 | 37.44 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 50.33 | 50.33 | 50.33 |
| | **Segment Total** | | **87.77** | **87.77** | **87.77** |
| Jonah Substation | Laney Member of the Green River Formation | Class 5 | 7.00 | 7.00 | 7.00 |
| Pull and Tension Sites | Alluvium and colluvium | Class 2 | 42.99 | 39.00 | 42.99 |
| | Undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation | Class 5 | 31.39 | 52.87 | 32.32 |
| | **Segment Total** | | **74.38** | **91.87** | **75.31** |
| **Grand Total Temporary** | | | **999.67** | **1,130.26** | **1070.20** |
| **Grand Total Long-term** | | | **80.61** | **88.69** | **85.90** |

Of the three alternatives, Alternative 1 has the potential to impact the fewest acres of Class 5 geologic units. However, Alternative 1 also has 27 known fossil localities within 1 mile, which is more than the other alternatives. The presence of these known localities indicates a high potential for adverse impacts to subsurface paleontological resources during ground disturbance.

#### 4.1.2.4 Alternative 2

Alternative 2 would consist of Segments 1A, 2A, 3, 4A, 5, 6A, 7, the Jonah Substation, the Paradise Substation A, and pulling and tensioning pads. Cumulatively, the APE for Alternative 2 is underlain by approximately 279.0 acres of Class 2 geologic units and 851.3 acres of Class 5 geologic units. The segment breakdown by geologic unit is provided in Table 4-2.

*Segment 1A*

Adverse effects to paleontological resources in Segment 1A would be proportional to unmitigated surface disturbance in sensitive surface and subsurface geological units with fossil potential. Segment 1A would potentially affect 187.5 acres of sensitive fossil-bearing geological units. Significant areas of Segment 1A are underlain by 48.1 acres of Class 5 resources from undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation.

*Segment 2A*

Segment 2A would potentially affect 224.8 acres of sensitive fossil-bearing geological units, including gravel, pediment, and fan deposits, alluvium and colluvium, undifferentiated Fontenelle Tongue of the Green River Formation, and New Fork Tongue of the Wasatch Formation. Segment 2A would result in potentially adverse affects to approximately 147.1 acres of Class 5 resources.

*Substation A*

The alternative substation location would potentially affect 30.5 acres of sensitive fossil-bearing geological units, including alluvium and colluvium and undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation. Substation A would result in potentially adverse affects to approximately 21.0 acres of Class 5 resources.

*Segment 4A*

Segment 4A would potentially affect 22.5 acres of sensitive fossil-bearing geologic units, including 12.2 acres of Class 5 undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation.

*Segment 6A*

Adverse effects to paleontological resources would be proportional to unmitigated surface disturbance in sensitive surface and subsurface geological units with fossil potential. Segment 6A would potentially affect 271.3 acres of sensitive fossil-bearing geological units of the undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation. No Laney Member of the Green River Formation resources would be affected.

Eight previously recorded fossil localities occur within 1 mile of this segment, one of which is within the APE (Section 3, T30N, R108W). In comparison, 17 localities have been documented within 1 mile of the proposed Segment 6. However, Segment 6 has scattered badlands exposures along the route whereas paleontologically sensitive bedrock along Segment 6A is mostly covered with vegetation.

Of the three alternatives, Alternative 2 has the potential to impact the greatest number of acres of Class 5 geologic units. Alternative 2 also has 18 known fossil localities within 1 mile (seven previously recorded localities within 1 mile of Segment 5; eight previously known localities within 1 mile of Segment 6; three localities within 1 mile of Segment 7), which is less than Alternative 1 and the same as Alternative 3. Therefore, of the three alternatives, Alternative 2 has the potential for more adverse impacts on paleontological resources than Alternative 3, but less potential than Alternative 1.

#### 4.1.2.5 Alternative 3

Alternative 3 would consist of Segments 1B, 2, 3, 4B, 5, 6B, 7, the Jonah Substation, the Paradise Substation B, and pulling and tensioning pads. Cumulatively, the APE for Alternative 3 is underlain by approximately 256.6 acres of Class 2 geologic units and 813.6 acres of Class 5 geologic units. The segment breakdown by geologic unit is provided in Table 4-2.

*Segment 1B*

Adverse effects to paleontological resources in Segment 1B would be proportional to unmitigated surface disturbance in sensitive surface and subsurface geological units with fossil potential. Segment 1B would potentially affect 185.2 acres of sensitive fossil-bearing geological units. Significant areas of Segment 1B are underlain by 43.0 acres of Class 5 resources from undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation, and the LaBarge and Chappo members of the Wasatch Formation.

*Substation B*

The Substation B location would potentially affect 29.8 acres of sensitive fossil-bearing geological units, including alluvium and colluvium and undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation. Substation B would potentially result in adverse affects to approximately 20.3 acres of Class 5 resources.

*Segment 4B*

Segment 4B would potentially affect 25.2 acres of sensitive fossil-bearing geologic units, including 12.5 acres of Class 5 undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation.

*Segment 6B*

Adverse effects to paleontological resources in Segment 6B would be proportional to unmitigated surface disturbance in sensitive surface and subsurface geological units with fossil potential. Segment 6B would potentially affect 271.3 acres of sensitive fossil-bearing geological units of the undifferentiated Fontenelle Tongue of the Green River Formation and New Fork Tongue of the Wasatch Formation. No Laney Member of the Green River Formation resources would be affected.

Eight previously recorded fossil localities occur within 1 mile of Segment 6B, one of which is within the APE (Section 3, T30N, R108W). In comparison, 17 localities have been documented within 1 mile of the proposed Segment 6. However, Segment 6 has scattered

badlands exposures along the route whereas paleontologically sensitive bedrock along Segment 6B is mostly covered with vegetation.

Alternative 3 has the potential to impact 813.6 acres of Class 5 geologic units, which is more than Alternative 1 and less than Alternative 2. Alternative 3 also has 18 known fossil localities within 1 mile (seven previously recorded localities within 1 mile of Segment 5; eight previously known localities within 1 mile of Segment 6; three localities within 1 mile of Segment 7), which is less than Alternative 1 and the same as Alternative 2. Therefore, of the three alternatives, Alternative 3 has the least potential for adverse impacts on paleontological resources.

#### 4.1.2.6 Cumulative Impacts

Multiple oil and gas drilling and production projects contribute to the cumulative impacts to paleontological resources in the Project Area. Where those and other private projects occur on fee land or state land, protection of paleontological resources and the information they contain may be lost. Increased cumulative impacts on paleontological resources from implementation of the Project would be expected to be minor due to the predominance of federal management with more stringent mitigation guidelines, and would be limited to direct and indirect impacts within the Project Area.

#### 4.1.2.7 Mitigation Opportunities

Mitigation measures recommended below would reduce adverse impacts to below the level of significance either through avoidance of resources or through fossil recovery, preservation, and permanent storage in a BLM-approved repository.

- All significant surface fossils were collected during the field survey of the Proposed Action and Segment 6A; therefore, immediate surface clearance would be recommended for Segments 1 through 7 and 6A, as well as the Jonah and Paradise substations.
- A field survey by a BLM-permitted paleontologist is recommended for Segments 1A, 1B, 2A; Paradise Substations A and B; Segments 4A and 4B; Segment 6B; the pulling and tensioning pads; and the 25-kV distribution line. All significant surficial fossils should be collected and housed in a BLM-approved repository. Further mitigation recommendations would be made by the BLM-permitted paleontologist based on the survey results. The BLM will consider the recommendations and determine the proper level of mitigation.
- In all areas underlain by PFYC Class 5 geologic units there is the potential for adverse impacts to subsurface (buried) paleontological resources during ground disturbance. This is further evidenced by the large number of mostly fragmentary and poorly preserved fossils that have eroded onto the surface in areas of badland topography inspected during the field survey.
    - Based on the results of the field survey, which was conducted by a BLM-permitted paleontologist, monitoring would be recommended for the excavations for the Jonah Substation (NWSW, Section 9, T28N, R108W) and Paradise Substation (Sections 4 and 9, T31N, R109W).

- Powerline poles for Segments 1, 3, 5, 6, and 7 would consist of wooden H-frame poles. The size of the excavations for these poles is anticipated to be small and they are expected to be drilled with an auger; therefore, monitoring would not be feasible as the drilling process typically pulverizes rocks and any contained fossils. However, the poles along Segments 2 and 4 would consist of reinforced steel monopoles. Ground disturbance associated with this construction is expected to be over a greater area and deeper than that for the wooden H-frames; therefore, paleontological monitoring would be recommended for construction activities associated with the steel monopole installation. If expected procedures change from those outlined in this EA, recommendations should be re-evaluated.
- Specific pole types for Segments 1A, 1B, 2A, 4A, 4B, 6A and 6B are unknown at this time. However, if steel monopoles are used, ground disturbance associated with construction should also be monitored.

- If feasible, it is recommended that the fossil fish locality (mentioned in Alternative 1) located in Section 20, T29N, R107W, be avoided in order to reduce the potential for adverse impacts to this known resource. If avoidance is not feasible, subsurface disturbance during construction should be monitored by a qualified and BLM-permitted paleontologist. The BLM has location data for this locality.
- If feasible, it is recommended that the fossil locality (mentioned in Alternative 2) located in Section 3, T30N, R108W, be avoided in order to reduce the potential for adverse impacts to this known resource. If avoidance is not feasible, subsurface disturbance during construction should be monitored by a qualified and BLM-permitted paleontologist. The BLM has location data for this locality.
- Should any subsurface bones or other potential fossils be discovered by construction personnel anywhere within the Project APE, the BLM must be notified immediately, as specifically stated in the Green River RMP (BLM 1997a), and work in the area of the discovery should cease until the BLM or a qualified and BLM-permitted paleontologist can assess the discovery, determine its significance, and make additional recommendations.

### 4.1.3 Water Resources

#### 4.1.3.1 Impact Criteria

Short-term direct and indirect impacts would be greatest during construction activities and would decrease as reclamation and mitigation procedures are implemented. The resource indicators used to assess potential impacts to the affected water resources environment address changes to both the water quality and physical hydrology (quantity and timing) of the resources.

Effects on water quality for both surface water and groundwater are indicated by changes in the measured values of water quality parameters. Effects on physical hydrology are indicated by changes in the timing and quantity of water downstream (for surface water) or downgradient (for groundwater) from the Project Area project activities. Changes in physical hydrology would also be indicated by changes in channel morphology, erosion, and drainage patterns.

Impacts to surface water resources from the Action Alternatives would be proportional to unmitigated effects of surface disturbance from construction and development activities, including grading, stockpiling, access road construction, and excavation. Detailed surface disturbance calculations for the Action Alternatives are provided in Appendix A. Surface-disturbing activities can affect surface water quality through increased sedimentation and runoff. Soil disturbance and the removal of vegetative cover increases the potential for soil erosion, which in turn increases sediment loading during runoff-producing storm events. Salts, metals, and organic substances contained in or adsorbed onto sediments can be transported into the surface waters along with the sediment and further degrade water quality. Soil erosion can also affect drainage patterns and channel morphology. Accidental spills of hazardous materials can also impact surface water. Increased surface runoff and erosion would occur primarily in the short term and would decline in time due to natural stabilization through particle aggregation, soil structure development, and armoring.

Impacts to water resources are assumed to be proportional to the amount of new surface disturbance for all alternatives, as identified in Table 4-3, since increased disturbance would result in a proportionally increased potential for runoff and erosion. Potential impacts from ground disturbances would be more pronounced in areas of steeper slopes. Direct and indirect adverse impacts to water resources can typically be reduced to below a level of significance through the implementation of effective mitigation measures including requiring a Storm Water Pollution Prevention Plan.

**Table 4-3. Temporary and Long-term Effects on Water Resources, by Alternative.**

| Type of Surface Disturbance | Alt. 1 | Alt. 2 | Alt. 3 |
|---|---|---|---|
| Total Temporary Disturbance (Acres) | 998.55 | 1,106.04 | 1,073.82 |
| Total Long-term Disturbance (Acres) | 79.60 | 87.66 | 84.58 |
| Temporary Disturbance on BLM (Acres) | 863.16 | 954.18 | 917.27 |
| Long-term Disturbance on BLM (Acres) | 71.75 | 77.87 | 75.68 |

#### 4.1.3.2 No Action Alternative

There would be no impacts on water resources if the electrical substations and high voltage transmission line are not built.

#### 4.1.3.3 Alternative 1

No potential impacts to groundwater resources would be anticipated from Alternative 1. Transmission structures would be buried in the ground at depths of up to 30 feet. Since the majority of the groundwater resources are deeper than 50 feet (Hamerlinck and Arneson 1998), Alternative 1 is not likely to affect groundwater resources.

There would be no use of or depletion of surface waters associated with Alternative 1. Due to increased surface disturbance from construction of the Jonah and Paradise substations and associated access roads, surface water drainage patterns may be altered locally. Runoff that otherwise would have infiltrated into the ground may flow more rapidly into nearby drainages as overland flow. This effect would likely be localized and would not alter the overall surface water patterns in the watershed. The proper engineering of infrastructure, implementation of a

Storm Water Pollution Prevention Plan, use of standard BMPs, and implementation of BLM-recommended BMPs and mitigation measures would help to reduce effects to drainage patterns and surface water quality. With the successful implementation of the proposed mitigation measures, only minor amounts of project-related runoff sediments would be anticipated to reach perennial surface waters, and surface water quality would not be significantly degraded.

Soil compaction resulting from development activities decreases the ability of the soil to infiltrate precipitation, leading to increased runoff. Runoff on or from the Jonah and Paradise substations and associated access roads would be conveyed at higher velocities than would occur with overland flow on undisturbed surfaces, resulting in increased erosion and sediment loading. Sediment and other pollutants present on roads could be transported in the runoff, contributing to water quality degradation. The extent of these impacts depends on the amount, type, and location of surface disturbance at any particular time and the climatic conditions.

Alternative 1 would have the lowest amount of potential runoff from surface disturbance compared with the other Action Alternatives. As shown in Table 4-3, temporary disturbance would occur in all parts of in the 150-foot ROW, from the combined effects of soil compaction and vegetation crushing from vehicle and work equipment use including anticipated grading and other ground-disturbing activity during construction and routine maintenance. Additional temporary disturbance would be anticipated outside of the ROW area. Appendix A provides detailed surface disturbance information for all alternatives. A total of 998.55 acres of temporary surface disturbance effects in Alternative 1 could increase runoff to surface water. The overall impact to surface water from the combined effects of Alternative 1 would be insignificant if all recommended BMPs and mitigation measures are implemented during the construction of the Project.

Long-term impacts to water resources from Alternative 1 installation of permanent impermeable surfaces and other long-term surface disturbance along the transmission line ROW would affect 79.60 acres. Of this amount, 71.75 acres would be on BLM land ownership. No long-term impact to water resources would be anticipated from the small increase in impermeable surface within the Project Area.

#### 4.1.3.4 Alternative 2

As shown in Table 4-3 and Appendix A, Alternative 2 would result in the highest level of surface disturbance compared with the other Action Alternatives, affecting a total of 1,106.04 acres of temporary surface disturbance, which could increase runoff to surface water. The short-term indirect impacts to surface water would be minor if all recommended BMPs and mitigation measures are implemented during the construction of the Project and followed quickly by approved reclamation.

Long-term impacts to water resources from Alternative 2 installation of permanent impermeable surfaces and other long-term surface disturbance along the transmission line ROW would affect 87.66 acres. Of this amount, 77.87 acres would be on BLM land ownership. No long-term impact to water resources would be anticipated from the small increase in impermeable surface within the Project Area.

#### 4.1.3.5 Alternative 3

As shown in Table 4-3 and Appendix A, Alternative 3 would result in an intermediate level of surface disturbance, affecting a total of 1,073.82 acres during construction, which could increase runoff to surface water if not controlled. The overall impact to surface water from the combined effects of Alternative 3 would be minor if all recommended BMPs and mitigation measures are implemented during the construction of the Project.

Long-term impacts to water resources from Alternative 3 installation of permanent impermeable surfaces and other long-term surface disturbance along the transmission line ROW would affect 84.58 acres. Of this amount, 75.68 acres would be on BLM land ownership. No long-term impact to water resources would be anticipated from the small increase in impermeable surface within the Project Area.

#### 4.1.3.6 Cumulative Impacts

The study area for cumulative impacts to water resources includes the portions of watersheds that the Project Area crosses containing West Muddy Creek, the Green River, the North Fork River and Alkali Creek. Existing activities in this area include historical and ongoing oil and gas development in the PAPA, JIDPA, and NPL Project Area, ranching and grazing, and any other proposed or reasonably foreseeable developments and activities.

The greatest risk of impacts to water resources exists along the Green and New Fork rivers where the ROW follows these drainages for the greatest length. The Green River is a Class 1 water in a portion of the Project Area. The remainder of the Green River and the New Fork rivers are Class 2AB in the Project Area, known to support game fish populations, spawning, or nursery areas at least seasonally, and where drinking water use is attainable. Unless it is shown otherwise, Class 2AB waters are presumed to have sufficient water quality and quantity to support drinking water supplies and are protected for that use.

The Project may contribute incremental long-term indirect cumulative impacts to water resources, based on the anticipated unauthorized use by OHV following Project construction and restoration, and the transformation of vegetated surface to impermeable surface for the substations. The Project would contribute incremental indirect impacts of up to 80.61 acres of long term surface disturbance for Alternative 1, 88.69 acres of disturbance for Alternative 2, and 85.9 acres of disturbance for Alternative 3. These incremental effects may add to other forms of surface disturbance already taking place on private and federal land for pipelines, roads, well pads, housing developments, and other commercial activities in the watersheds of the cumulative effects area.

Surface waters of the Green and New Fork rivers are of greatest concern since the transmission lines are in close proximity to the rivers and several other private and federal activities are also taking place in these areas. Any cumulative effects from this and other projects that could result in future impairment of the Class 1 and Class 2AB waters would be considered a significant adverse impact. Long-term cumulative impacts on surface water resources from the indirect effects of surface disturbance may include increased sedimentation and water quality degradation.

Implementation of mitigation measures and BMPs contained the PFO RMP Appendix 3 would reduce adverse impacts (BLM 2008a). Implementation of additional measures to monitor and detect unauthorized surface use over the life of the project, and conduct additional reclamation as needed to reduce erosion and sedimentation impacts would reduce any incremental impacts to the Green and New Fork rivers.

#### 4.1.3.7 Mitigation Opportunities

No permanent cumulative impacts would be anticipated with Alternative 1 or any of the Action Alternatives because all future development activities would comply with Section 404 of the Clean Water Act and EOs 11988 and 11990. Other mitigation opportunities to minimize potential impacts to water resources include the following.

- Transmission alignment crossings of perennial and intermittent streams would be located at points that minimize disturbance to the stream channel and associated riparian habitat. For surface disturbance within the high bank of any ephemeral or intermittent stream, or within the high bank +50 feet of any perennial stream, Alternative 1 would be designed to protect fish spawning, fry, and other important fish life stages and habitats within the stream or connected streams and to maintain fish passage. All disturbances occurring within the high bank +50 feet would be reclaimed to meet Proper Functioning Condition standards.
- Appropriate areas for power pole installation and placement would be identified during construction design planning.
- Surface disturbances would be avoided within 500 feet of surface water, riparian areas, wetlands, and 100-year floodplains unless it is determined through site-specific analysis, approved in writing by the BLM, that no practicable alternative to Alternative 1 exists.
- Prudent use of erosion control measures would be employed to control transportation of upland erosion from surface-disturbing activities to stream systems.
- After interim reclamation, BLM would monitor the Project ROW for any signs of unauthorized surface disturbance, and notify Rocky Mountain Power of the need for prompt erosion control and reclamation to control sediment transport to stream systems.

## 4.2 BIOLOGICAL ENVIRONMENT

### 4.2.1 Vegetation Resources

#### 4.2.1.1 Impact Criteria

Direct adverse impacts to vegetation resources would result from vegetation crushing by heavy equipment and vehicles, and surface disturbances such as mechanical grading and clearing of vegetation. Temporary impacts to vegetation would also result in crushing of existing vegetation and compaction of soils from construction and maintenance traffic within the 150-foot construction corridor and dragging transmission lines through vegetation. These impacts may be short-term if the disturbed areas are re-seeded after clearing. Long-term impact would result from construction of permanent new facilities.

Long-term loss of area of Wyoming big sagebrush community is an important indicator of adverse impacts. Wyoming big sagebrush is dominant in the Project Area. A reduction in shrub cover and increased herbaceous cover could provide increased forage for some wildlife and livestock before the pre-disturbance community structure is restored. Shrubs may take 30 to 100 years or longer to reach pre-disturbance productivity levels and wildlife habitat complexity (Braun 1998; Slater 2003). Because it would take many years for impacted and reclaimed areas to develop the structure and function of their pre-disturbance condition, impacts would persist for an undetermined number of years. Reclaimed areas would produce less wildlife and livestock forage initially until revegetation is considered successful, at which time native grasses and possibly forbs would become established. Crushing of shrub riparian and forested riparian vegetation would also result in adverse direct impacts due to the ecological value and rarity of these habitat areas.

Indirect impacts that could occur as a result of project activities include increased water runoff and accelerated soil loss and erosion due to the surface disturbance and loss of stabilizing vegetation until interim reclamation restabilizes soil surfaces. Potential soil loss would be much greater in areas with a steep grade or a high exposure to the elements of weather. Another short-term indirect impact in areas that are cleared of vegetation and the soil has been disturbed and/or exposed is invasion of noxious weed species.

#### 4.2.1.2 No Action Alternative

Under the No Action Alternative, no additional impacts to vegetation other than those previously approved for the Project Area would occur.

#### 4.2.1.3 Alternative 1

Table 4-4 provides a summary comparison of the effects of the alternatives, including Alternative 1, on vegetation resources in the Project Area. Direct short-term impacts would occur during construction of Alternative 1. As shown in Appendix A, approximately 999.67 acres would be subject to crushing or removal of vegetation by construction equipment during the construction. Soil disturbance by mechanical grading and leveling to construct the Paradise and Jonah substations would result in 30 acres of the short-term surface disturbance, while the remainder would be the result of transmission structure placement, pole augering, and placement of pulling and tensioning equipment. All areas where direct soil disturbance occurs would be recontoured and re-seeded as part of an interim reclamation plan, resulting in approximately 79.60 acres of long-term surface disturbance where utility pole structures and substations are located, and where informal and unauthorized OHV use results in a 2-track road.

Clearing of vegetation and grading the soil surface to construct and assemble the proposed Jonah and Paradise substations would result in both temporary and permanent surface disturbances and loss of vegetation and habitat. Temporary surface disturbances that would be associated with the Jonah and Paradise substations during construction activities would include approximately 15 acres for each substation and work area. The overall disturbance to vegetation due to the substations would be approximately 30 acres.

Long-term impacts on vegetation would result from loss of vegetation where permanent facilities are located.

**Table 4-4. Project Effects on Vegetation Resources, by Alternative.**

| Project Segment | Vegetation Community | Alternative 1 Construction Disturbance (Acres) | Alternative 2 Construction Disturbance (Acres) | Alternative 3 Construction Disturbance (Acres) |
|---|---|---|---|---|
| 1 | Wyoming Big Sagebrush | 114.69 | 117.32 | 114.98 |
| | Agriculture/Irrigated Crops | 25.04 | 25.04 | 25.04 |
| | Shrub-dominated Riparian | 18.68 | 18.68 | 18.68 |
| | Greasewood | 15.52 | 15.52 | 15.52 |
| | Mixed Grasslands | 10.93 | 10.93 | 10.93 |
| 2 | Wyoming Big Sagebrush | 141.08 | 170.45 | 141.24 |
| | Agriculture/Irrigated Crops | 16.29 | 16.29 | 16.29 |
| | Mixed Grasslands | 12.40 | 23.77 | 12.40 |
| | Human Settlement | 10.27 | 10.27 | 10.27 |
| | Forest-dominated Riparian | 3.98 | 3.98 | 3.98 |
| | Rock/Bare Ground | 3.38 | NA | 3.38 |
| Paradise Substation and 25-kV line | Irrigated Crop-Riparian | 5.84 | 5.84 | 5.84 |
| | Irrigated Crops-Upland | 9.14 | 9.14 | 9.14 |
| | Wyoming Big Sagebrush | 16.02 | 15.48 | 14.77 |
| 3 | Wyoming Big Sagebrush | 79.17 | 80.84 | 79.50 |
| | Mixed Grasslands | 9.99 | 9.99 | 9.99 |
| 4 | Wyoming Big Sagebrush | 9.25 | 10.71 | 14.55 |
| | Agriculture/Irrigated Crops-Riparian | 6.45 | 8.13 | 8.34 |
| | Forest-dominated Riparian | 3.14 | 2.88 | 2.34 |
| | Greasewood | 0.19 | 0.82 | NA |
| 5 | Wyoming Big Sagebrush | 72.55 | 72.55 | 67.97 |
| | Mixed Grasslands | 43.73 | 43.73 | 43.73 |
| 6 | Wyoming Big Sagebrush | 193.86 | 268.82 | 268.54 |
| | Mixed grasslands | 7.78 | 1.63 | 1.63 |
| | Rock-Bare Ground | 1.16 | 0.80 | 1.07 |
| 7 | Wyoming Big Sagebrush | 64.32 | 64.32 | 64.32 |
| | Mixed grasslands | 23.45 | 23.45 | 23.45 |
| Jonah Substation | Wyoming Big Sagebrush | 7.00 | 7.00 | 7.00 |

The distances of each vegetation type crossed by each segment and acreages that may be impacted are described in the following subsections and are summarized in Table 4-4.

As shown in Table 4-4, vegetation impacts would occur from construction surface-disturbing activities that crush, remove, blade, grade, or auger in vegetation. Under Alternative 1, 697.94 acres of Wyoming big sagebrush and 7.12 acres of forest-dominated riparian vegetation, two of the more important vegetation types in the Project Area, would be disturbed. These vegetation types would be slow to recover from construction activities and their destruction or loss would represent a potentially adverse short-term impact to the ecological value of the

Project Area. Wyoming big sagebrush provides important wildlife habitat values, and riparian woodlands are rare in the Project Area and provide high ecological value to many species.

Installation of new permanent facilities at the substations would result in the long-term loss of approximately 23 acres of Wyoming big sagebrush, with additional acres disturbed by long-term two-track road use along the ROW corridor. These long-term impacts would be adverse due to the ecological importance of this native vegetation type, but not considered significant due to the relative abundance of this vegetation type in the Project Area.

#### 4.2.1.4 Alternative 2

The types of direct and indirect impacts would be the same for all of the Action Alternatives, but would differ in the amount of acreage impacted. Table 4-4 shows the comparison of effects of vegetation loss between the Action Alternatives. Short-term impacts from construction of Alternative 2 would increase due to the effects of crushing and/or removal, totaling 807.49 acres of Wyoming big sagebrush and 6.86 acres of forest-dominated riparian vegetation.

Installation of new permanent facilities at the substations would result in the long-term loss of approximately 23 acres of Wyoming big sagebrush, with additional acres disturbed by long-term two-track road use along the ROW corridor. These long-term impacts would be considered moderate, due to the ecological importance of this native vegetation type.

#### 4.2.1.5 Alternative 3

Short-term impacts from construction of Alternative 3 would result in crushing and/or removal of 772.87 acres of Wyoming big sagebrush, and 6.32 acres of forest-dominated riparian vegetation.

Long-term impacts of Alternative 3 would be similar to the other Action Alternatives.

The Wyoming big sagebrush shrubland community is the dominant vegetation type in the study area, and would experience the greatest amount of short-term disturbance under Alternative 3 and the least impact under Alternative 2. Reclamation and revegetation efforts would be required for all areas of temporary disturbance within the Project Area. These efforts typically involve recontouring and planting native grasses. With these mitigation measures, the cumulative project impacts to vegetation would be reduced over time.

#### 4.2.1.6 Cumulative Impacts

The cumulative impacts study area for vegetation includes the proposed Project corridor and the adjacent Jonah Gas Field. Existing activities and other reasonable and foreseeable actions in the Project Area include historical and ongoing oil and gas development, ranching and grazing, and any proposed or reasonably foreseeable developments and activities. These activities have all contributed to the removal of native vegetation, and an increase in invasive and noxious weed species in the area. Adverse impacts to vegetation from oil and gas development in the study area have occurred as a result of past and ongoing development.

#### 4.2.1.7 Mitigation Opportunities

Many mitigation measures have been developed to reduce potential adverse impacts of construction on vegetation in the Project Area. For all locations and access roads, the reclamation contractor or operator would promptly redistribute topsoil, and recontour and revegetate all disturbed areas outside of transmission pole and substation footprints with a BLM-approved seed mixture outlined in the transmission line and substations Plans of Development (PODs). Revegetation would commence immediately after construction and debris would not be scattered on the transmission line until after seeding operations are completed. Seed mixtures would meet all the requirements of the Federal Seed Act and the seed laws and noxious weed laws of Wyoming and only certified, weed-free seed would be used. Broadcast seeding would be used as the method of application after the seedbed preparation is complete. Seeding would take place in the fall (September to November); however, if this cannot be done, spring seeding should take place in February or March as conditions dictate. If the seed does not germinate and establish to at least one desirable perennial species per square foot after two growing seasons, the contractor or Rocky Mountain Power would reseed the area or take other reclamation actions until the success criteria is met.

The operator and reclamation contractor would coordinate with the BLM Authorized Officer (AO) to determine the specifics of site reclamation. The BLM AO would use discretion to determine if additional measures need to be incorporated to increase reclamation success. Measures may include, but are not limited to, irrigation of reclaimed site, fencing around perimeter of reclaimed area, use of matting, seeding of crown and ditch of roadways and other areas not needed for ongoing operations, as well as the incorporation of other new technologies. Any fencing that is installed would follow guidelines set forth by the BLM AO.

Reclamation achievement would be evaluated using the Public Land Health Standards that include Indicators of Rangeland Health (BLM 1997b). Periodic monitoring would take place during construction and reclamation to assure contractor compliance to specified construction activities and success of restoration practices. Rehabilitation efforts must be repeated if it is concluded that the success rate is below an acceptable level as determined by the BLM.

A reclamation status report would be submitted to the RSFO and PFO annually for all actions that require the disturbance of surface soils on BLM-administered lands as a result of Alternative 1. Internal and external review of this report and the process used to acquire the necessary information would be conducted annually, and new information or changes in the reporting process would be incorporated into the report. PacifiCorp would conduct all surface activities in accordance with the Pinedale RMP (BLM 2008a) and the Green River RMP (BLM 1997a). Materials and methods must be approved in advance by the BLM AO.

Off-road driving would be restricted to the ROW corridors and approved temporary access roads during construction and maintenance activities.

### 4.2.2 Wetlands, Riparian Areas, and Floodplains

#### 4.2.2.1 Impact Criteria

Direct impacts to wetlands and floodplains would include the potential disturbance and displacement of wetland and floodplain vegetation around steel towers and around H-frame poles. Direct impacts to wetlands and riparian resources would also occur from equipment operation in wetland areas. To the extent that the Project would be able to completely or partially avoid all driving and equipment operation within wetlands and riparian areas, and span those areas with overhead cable, no adverse impacts would occur to these resources. The crushing or removal of riparian and wetlands vegetation would result in adverse direct impact to wetlands and riparian resources.

Indirect impacts may also include damage to wetland substrate and impacts to water quality and flow from heavy equipment traffic during installation of the towers along the transmission line. Indirect impacts to wetland and riparian resources would occur from construction-related erosion and sediment movement, which are covered by applicable Storm Water Pollution Prevention Plans (see Section 4.1.3). Any impacts not compliant with Section 404 of the Clean Water Act would be considered significant.

#### 4.2.2.2 No Action Alternative

Under the No Action Alternative, no additional impacts to wetlands, floodplains, and riparian areas other than those previously approved for the Project Area would occur.

#### 4.2.2.3 Alternative 1

Impacts that would result from Alternative 1 would be both direct and indirect in nature and would take place primarily during construction and periodic maintenance activities. All potential adverse impacts to wetlands and riparian areas could be avoided or mitigated by careful project planning to prevent equipment operation or construction within wetlands, riparian areas, and floodplains to the extent possible.

The proposed transmission line ROW would cross valleys, depressions, stream channels, floodplains, and wetlands. Transmission line poles along the Project corridor would be positioned to span these areas to the largest degree possible. However, locations along the Project corridor that follow Muddy Creek and cross the Green River are too wide for support poles to completely span floodplains and wetlands. Steel poles may need to be placed within the floodplains (which are typically dry) of the Green and New Fork rivers along the beginning of Segment 2; however, wetlands and riparian areas would be avoided within these floodplains. Wooden H-frame poles may also need to be placed within some wetlands adjacent to the Muddy Creek drainage along the south/north-running portion of Segment 1.

These impacts would be expected to be minimal, because the H-frame towers would be erected on upland islands or hummocks along Section 1 to avoid impacts to wetlands. No clearing and/or grading would take place along the transmission line ROW. Construction areas, including pulling and tensioning stations, and equipment staging areas would not be cleared of vegetation and would be designed to avoid wetlands, floodplains, and riparian corridors. Construction activities would be kept at a distance away from these features, so water quality and hydrology would not be impacted by surface disturbances. Also, the

floodplain where steel poles would be placed in Section 2 is typically dry and wetlands and riparian areas would be avoided.

The Wyoming BLM's *Standard Mitigation Guidelines for Surface-Disturbing Activities* require that projects should avoid surface disturbances within 500 feet of surface water, riparian areas, wetlands, and 100-year floodplains unless it is determined through site-specific analysis and approved in writing by the BLM. The BLM also requires construction to be restricted within 100 feet of the edge of the inner gorge of intermittent and large ephemeral drainages (BLM 1997a, 2008b). To the extent practical, all segments along the Project corridor that cross drainages and/or riparian areas would span those areas, thus avoiding impacts to the resource. Wetlands would also be spanned or avoided by transmission pole placement to the greatest extent practicable. Consequently, there would be no direct or indirect impacts to wetlands, floodplains, and riparian areas as a result of Alternative 1.

Potential impacts to wetlands from the proposed Project would be coordinated and permitted under Section 404 of the Clean Water Act under guidance of the USACE Wyoming regulatory office in Cheyenne, Wyoming, and would meet water quality standards required by the WDEQ.

Due diligence by the project proponent would be performed prior to project implementation to comply with all local and federal regulations pertaining to the wetland habitats and the Clean Water Act of 1972. If jurisdictional wetlands or waters of the U.S. are identified within the Project Area through onsite wetland delineations, the appropriate permits and authorization (e.g., Nationwide Permit [NWP] 12) would be obtained through the USACE prior to construction activities. Special and general conditions of all applicable authorizations would be adhered to, and BMPs for erosion, sedimentation, and stormwater management would be followed. With the proper implementation of BMPs and adherence to federal and state laws, no significant impacts to nearby wetlands, floodplains, and riparian areas would be expected.

According to the USFWS NWI database, under Alternative 1, approximately 39.92 acres of wetlands and riparian areas are contained within the 150-foot corridor of the proposed Project (Table 4-5). Wetlands and riparian areas within the construction ROW would be identified and avoided by construction and maintenance traffic. Where possible utility poles would be placed outside of wetlands and riparian areas and the transmission line would span these areas. Any wetlands and floodplains that would be impacted by Project construction would be subject to Section 404 of the Clean Water Act.

Under Alternative 1, temporary impacts may occur within the proposed ROW during construction of the transmission line, which may intercept 35.77 acres of freshwater emergent wetlands according to wetlands mapped by NWI. Approximately 2.5105 acres of freshwater forested shrub wetlands may also occur within the APE. These wetlands would be avoided to the largest degree possible during construction and installation of the transmission line, and spanned by the transmission cables whenever possible.

**Table 4-5. Effects on Wetland and Riparian Resources, by Alternative.**

| Project Area | Wetland/Riparian Type | Alternative 1 (acres) | Alternative 2 (acres) | Alternative 3 (acres) |
|---|---|---|---|---|
| 1 | Freshwater Emergent Wetland | 23.77 | 23.77 | 23.77 |
| | Freshwater Forested/Shrub Wetland | 0.0005 | 0.0005 | 0.0005 |
| 2 | Freshwater Emergent Wetland | 12.00 | 12.00 | 12.00 |
| | Freshwater Forested/Shrub Wetland | 2.42 | 2.42 | 2.42 |
| | Freshwater Pond | 0.21-spanned | 0.21-spanned | 0.21-spanned |
| | Riverine | 0.69-spanned | 0.69-spanned | 0.69-spanned |
| Paradise Substation and 25-kV line | None | NA | 0.05 | 0.05 |
| 3 | None | NA | NA | NA |
| 4 | Freshwater Forested/Shrub Wetland | 0.09 | 1.08 | 0.03 |
| | Riverine | 0.74 | 0.65 | 0.65 |
| 5 | None | NA | NA | NA |
| 6 | Freshwater Pond | NA | 0.17 | 0.17 |
| 7 | None | NA | NA | NA |
| Jonah Substation | None | NA | NA | NA |

No wetlands and/or floodplains are known to be present at either proposed Substation locations, and no long-term wetland loss is anticipated from Alternative 1

The overall anticipated impact of Alternative 1 on wetlands and riparian areas would be minor, but adverse, and any adverse impacts would require mitigation.

#### 4.2.2.4 Alternative 2

The types of direct and indirect impacts would be similar for all of the alternatives, but would differ in the amount of acreage impacted. Table 4-5 shows the comparison of effects among the Action Alternatives. According to the USFWS NWI database, Alternative 2 may intercept the same number of acres of freshwater emergent wetlands as Alternative 1. Approximately 3.50 acres of freshwater forested shrub wetlands may also occur within the area of construction. These wetlands would be avoided to the largest degree possible during construction and installation of the transmission line, and spanned by the transmission cables whenever possible.

Approximately 0.05 acre of wetlands may be present at the Paradise Substation A in Alternative 2. If direct effects to wetlands cannot be avoided during construction, the impact of the alternative on wetlands and riparian areas would be adverse, and would require mitigation.

Wetlands and riparian areas within the construction ROW would be identified and avoided by construction and maintenance traffic. Where possible utility poles would be placed outside of wetlands and riparian areas and the transmission line would span these areas. Any wetlands and floodplains that would be impacted by Project construction would be subject to Section 404 of the Clean Water Act.

#### 4.2.2.5 Alternative 3

Short-term impacts from implementing Alternative 3, shown in Table 4-5, may occur during construction of the transmission line across a total of 35.77 acres of freshwater emergent wetlands according to wetlands mapped by NWI. Approximately 2.45 acres of freshwater forested shrub wetlands may also occur within the APE. These wetlands would be avoided to the largest degree possible during construction and installation of the transmission line. Approximately 0.05 acre of wetlands may be present at the Paradise Substation B location in Alternative 3.

Wetlands and riparian areas within the construction ROW would be identified and avoided by construction and maintenance traffic. Where possible utility poles would be placed outside of wetlands and riparian areas and the transmission line would span these areas. Any wetlands and floodplains that would be impacted by Project construction would be subject to Section 404 of the Clean Water Act.

#### 4.2.2.6 Cumulative Impacts

The cumulative impacts study area for wetlands, floodplains, and riparian areas includes those areas within the Project Area. Existing activities in this area include historical and ongoing oil and gas development, ranching and grazing, and any proposed or reasonably foreseeable developments and activities. Wetlands, floodplains, waters of the U.S., and riparian areas would be avoided where possible during implementation of this and other proposed projects in the area. Impacts to wetlands and riparian areas would not be expected as a result of Alternative 1 and thus would not contribute to cumulative impacts on these resources. No permanent cumulative impacts are anticipated because all future development activities would comply with Section 404 of the Clean Water Act and EOs 11988 and 11990.

#### 4.2.2.7 Mitigation Opportunities

To mitigate for and minimize potential surface water impacts, the narrowest portions of perennial and intermittent streams have been selected to allow the transmission line to span these resources. Appropriate areas for power pole installations and placement would be identified during construction design planning; routing of any construction access road would be placed outside the 500-foot buffer around wetland areas; and construction activities would be limited to seasons of low flow or dry conditions. All stream crossings would be analyzed on a project-specific basis during the construction planning process and through Clean Water Act permitting, if necessary.

Continued implementation of these stipulations would adequately protect riparian areas, floodplains, and wetlands if such conditions are later documented within the Project Area.

### 4.2.3 Special Status Species

#### 4.2.3.1 Impact Criteria

Potential impacts of the Project to Special Status Species, as identified in Section 3.2.3, are almost entirely related to direct and indirect effects resulting in the loss of individuals or populations, or loss of suitable or occupied habitat, or reduction in the attributes that contribute to habitat quality for species. Since every species is different in the range of suitable habitat characteristics, determinations of potential impacts are made on a case-by-case basis in this section. A Draft Biological Assessment for this Project has been prepared for the USFWS and is included in Appendix D.

#### 4.2.3.2 No Action Alternative

There would be no impact on federally listed animal species if the electrical substations and high voltage transmission line are not built.

#### 4.2.3.3 Alternative 1

*Black-footed Ferret (BFF)*

No BFF were found during 2008 surveys and BFF are not expected to occur along any segment within the Alternative 1 ROW or vicinity. If future surveys within the Big Piney Prairie Dog Complex find BFF, then status information should be forwarded to the USFWS and appropriate avoidance protocol implemented. Utility poles and transmission lines would not affect the BFF's ability to hunt or to reproduce, should they be found to survive in the area. The placement of poles and lines within a prairie dog town may attract raptors and increase diurnal hunting in the vicinity, but would not contribute to predation pressure on BFF since they are nocturnal and spend most of their time underground in pursuit of prairie dogs. Impacts to prairie dogs may indirectly affect BFF and those impacts are discussed in the BLM Sensitive Species section (Section 4.2.4).

*Gray Wolf*

Alternative 1 would not impact the gray wolf since all segments of the ROW would be outside of the known range of Wyoming packs and they do not rely on the Project Area for hunting or breeding. Gray wolves may be temporarily deterred from passing through the Project Area during construction due to noise and human activity; however, the transmission lines and poles would not affect their movement. No adverse impact to gray wolf is anticipated as a result of the Project.

*Listed Fish Species*

No water withdrawals or depletions would be associated with Alternative 1 and no impacts to water quality would be expected with mitigation measures in place to protect water resources. Therefore, there would be no impacts to Colorado pikeminnow, razorback sucker, humpback chub, and bonytail chub downstream from the Project Area.

*Yellow-billed Cuckoo*

Utility poles would be located in potential western yellow-billed cuckoo habitat (shrub and forest-dominated riparian) at the Green and New Fork river crossings – Segments 1, 2, and 4. Approximately 25.8 acres of potential habitat is located within the construction ROW which would not be removed but could be crushed during construction (Table 4-4). Most of the

habitat loss would be temporary and only a small area of habitat would be permanently replaced by the utility poles. This minimal loss of riparian habitat would not cause significant impacts to the western yellow-billed cuckoo. Other potential impacts to these birds would include collisions with the transmission line where it crosses the rivers at Segments 2 and 4.

#### 4.2.3.4 Alternative 2

Potential impacts to BFF, gray wolf, and Colorado River fishes would be the same as described for Alternative 1. A portion of Segment 1A would be located within potential western yellow-billed cuckoo habitat; however, there would be no additional impacts to this habitat compared to Segment 1.

Segment 4A would be located within potential western yellow-billed cuckoo habitat; however, this segment includes 0.42 acre less potential habitat; however this segment includes 0.8 acres less potential habitat compared to Segment 4 of Alternative 1 and 0.54 acre less than Alternative 2. Suitable or occupied habitat for federally listed animal species is not known to occur in the area of Segment 6A. Therefore, no potential impacts to listed species would occur as a result of this alternative.

#### 4.2.3.5 Alternative 3

Potential impacts to BFF, gray wolf, and Colorado River fishes would be the same as described for Alternatives 1 and 2. A portion of Segment 1A would be located within potential western yellow-billed cuckoo habitat; however, there would be no additional impacts to this habitat compared to Segment 1.

Potential impacts to BFF, gray wolf, and Colorado River fishes would be the same as described for Alternative 1. Segment 4A would be located within potential western yellow-billed cuckoo habitat with similar habitat compared to Segment 4 of Alternative 1. Suitable or occupied habitat for federally listed animal species is not known to occur in the area of Segment 6A. Therefore, no potential impacts to listed species would occur as a result of this alternative.

#### 4.2.3.6 Cumulative Impacts

Federally listed animal species are not anticipated because the species would not be affected as a result of Alternative 1; therefore, no incremental or cumulative impacts would occur.

#### 4.2.3.7 Mitigation Opportunities

If any federally listed species are observed during pre-construction surveying or project operations, status information would be forwarded to the USFWS and appropriate avoidance protocol implemented. Operations that would adversely affect the listed species must be discontinued until consultation with the USFWS indicates that impacts are not likely to adversely affect the species. To protect avian species, including yellow-billed cuckoo, the transmission line design for river crossings, plus three spans on either side, would include bird flight diverters (design to be discussed) installed on the high neutral.

### 4.2.4 BLM Sensitive Animal Species

#### 4.2.4.1 Impact Criteria

Most impacts to sensitive wildlife would be short-term and would involve, but not limited to, crushing of existing vegetation and compaction of soils from construction and maintenance traffic, and disturbance from noise and human activity. Impacts to vegetation can reduce nesting and foraging habitat from direct disturbance as well as indirectly from weed proliferations. Therefore, the indicator to be used for impacts to BLM sensitive species would be surface disturbance within suitable habitat for each species.

Transmission structures offer perches for raptors and may increase predation on sensitive species, including pygmy rabbits, white-tailed prairie dogs, Idaho pocket gophers, and burrowing owls. A recent study in southwestern Wyoming suggested that perch deterrents can reduce raptor and raven predation (Slater and Smith 2008). Results of the driving surveys, behavioral observations, and prey-remains surveys all suggested that raptor and raven use of primary cross-arm and pole-top perches was significantly lower on lines with deterrents compared to lines without deterrents. Significantly fewer (a ten-fold decrease) single prey items were found under the deterrent line than under the control line. However, these surveys also revealed that the deterrent devices did not completely exclude raptors and ravens because some birds are likely to overcome the deterrent devices to take advantage of these rare tall structures in sagebrush steppe. So, whereas the addition of tall structures in a landscape that generally lacks trees is seen as a negative impact to prey species, sensitive raptors may benefit from addition of these structures.

Transmission line structures do not result in significant habitat fragmentation for most species since they have a relatively small footprint on the ground. The poles are not expected to restrict the movement of any species. Sensitive species would be temporarily impacted by reduction of habitat during construction and reclamation. For example, short-term loss of sagebrush habitat from crushing and removal would temporarily impact greater sage-grouse, sage sparrow, sage thrasher, loggerhead shrike, and Brewer’s sparrow. Sensitive birds may also be impacted by increased fatalities due to electrocutions and collisions with transmission lines.

#### 4.2.4.2 No Action Alternative

There would be no impacts on BLM sensitive animal species if the substations and high voltage transmission lines are not built.

#### 4.2.4.3 Alternative 1

Table 4-6 compares the impacts to suitable habitat for those sensitive species for which data are available. Acreages are based on a 150-foot-wide ROW; these areas would be temporarily impacted as vegetation is crushed during construction. At the substations, vegetation would be cleared for construction and vegetation would re-establish outside of the fenced area after construction. Only a relatively small area of sensitive species habitat would be permanently replaced by the utility poles and facilities.

**Table 4-6. Short-term Effects on BLM-listed Species Habitats, by Alternative.**

| Project Segment | Species | Alternative 1 (Acres) | Alternative 2 (Acres) | Alternative 3 (Acres) |
|---|---|---|---|---|
| 1 | White-tailed prairie dog | NA | NA | NA |
| | Pygmy rabbit | 0.05 | NA | NA |
| | Greater sage-grouse | 49.14 | 51.77 | 49.43 |
| | Raptors | 41.85 | 43.50 | 42.04 |
| 2 | White-tailed prairie dog | 11.06 | 11.06 | 11.06 |
| | Pygmy rabbit | 0.77 | NA | 0.77 |
| | Greater sage-grouse | 60.33 | 84.86 | 60.49 |
| | Raptors | 55.52 | 87.12 | 55.69 |
| Paradise Substation | Greater sage-grouse | 2.45 | 6.92 | 1.46 |
| | Raptors | 6.92 | 6.92 | 6.65 |
| 25-kV Line | Raptors | 24.08 | 23.55 | 23.11 |
| | Greater sage-grouse | NA | 1.74 | NA |
| 3 | White-tailed prairie dog | 18.09 | 18.09 | 18.09 |
| | Pygmy rabbit | 0.23 | 0.23 | 0.23 |
| | Greater sage-grouse | 65.52 | 66.09 | 65.85 |
| | Raptors | 69.03 | 70.70 | 69.36 |
| 4 | White-tailed prairie dog | 5.08 | 5.11 | 5.11 |
| | Pygmy rabbit | NA | NA | 0.29 |
| | Raptors | 19.03 | 22.55 | 25.23 |
| 5 | Pygmy rabbit | 1.30 | 1.30 | 1.30 |
| | Greater sage-grouse | 59.52 | 59.52 | 59.52 |
| | Mountain plover | 0.26 | 0.26 | 0.26 |
| | Raptors | 11.24 | 11.24 | 6.66 |
| 6 | Pygmy rabbit | 5.59 | 10.06 | 9.55 |
| | Greater sage-grouse | 166.62 | 82.35 | 82.35 |
| | Mountain plover | 1.19 | NA | NA |
| | Raptors | NA | 12.66 | 12.66 |
| 7 | Pygmy rabbit | 1.96 | 1.96 | 1.96 |
| | Greater sage-grouse | 15.93 | 15.93 | 15.93 |
| | Mountain plover | 9.93 | 9.93 | 9.93 |
| | Raptors | 30.67 | 30.67 | 30.67 |
| Jonah Substation | Pygmy rabbit | 0.00 | 0.00 | 0.00 |
| Out-of ROW Pull and Tension Sites | White-tailed prairie dog | 10.56 | 10.56 | 10.56 |
| | Pygmy rabbit | 0.31 | NA | NA |
| | Greater sage-grouse | 20.62 | 3.05 | NA |
| | Raptors | 21.55 | 36.47 | 21.55 |

*White-tailed Prairie Dog*

Under Alternative 1, the transmission line would bisect known white-tailed prairie dog towns, including large towns located on the west side of the New Fork River. Effects to prairie dog habitat along each segment are shown in Table 4-6. Temporary impacts would be moderate for white-tailed prairie dogs and would result from construction activities (e.g., crushing vegetation) over approximately 44.79 acres. Prairie dogs may be temporarily displaced during construction activities, but would be expected to re-establish quickly after construction is completed.

Long-term impacts may occur from loss of 2.43 acres of available habitat and the indirect effects of increased predation along 2.0 miles of added overhead powerlines. These long-term changes are not anticipated to affect the local population of prairie dogs. A slight increase in predation rates on prairie dogs may be expected to affect survival of individual prairie dogs, but would not affect the population of white-tailed prairie dogs at the colony level.

*Raptors*

Alternative 1 would temporarily affect 272.97 acres inside of raptor nest buffer areas, as shown in Tables 4-6 and 4-7. Impacts to riparian vegetation may temporarily disturb peregrine falcon foraging habitat. Raptors could benefit from the addition of tall structures that provide nest sites and perches from which to hunt. Pre-construction raptor surveys would be conducted to determine the species presence and status of nests. An active eagle nest is one that has been occupied once in the past five years (three years for all other raptors). Impacts to vegetation within buffers of known raptor nests are shown in Table 4-6. A ferruginous hawk nest occurs within 1 mile of the location of Alternative 1 Paradise Substation and overhead powerlines.

BLM timing stipulations and surface use restrictions would be enforced for sensitive raptors in addition to perch-deterrent devices and visual enhancement device placement in areas where collisions are anticipated. With appropriate mitigation including the seasonal stipulations within raptor buffer areas, shown in Table 4-8, no impacts would be expected.

Long-term impacts may occur from loss of 18.55 acres of available habitat within buffer areas, and the indirect effects of collision increases along 15.3 miles of added overhead powerlines. In addition, the Project would construct structures in burrowing owl territories that may be used by other raptor species; thus, increasing competition for prey resources between burrowing owls and other raptors. These long-term changes would not be anticipated to affect the local raptor population.

**Table 4-7. Summary of Short-term and Long-term Effects on BLM-listed Species Habitats, by Alternative.**

| Species | Disturbance Type | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|---|
| White-tailed prairie dog | Short-term habitat disturbance (acres) | 44.79 | 44.82 | 44.82 |
| | Long-term Overhead Lines (miles) | 2.00 | 2.00 | 2.00 |
| | Long-term Habitat Loss (acre) | 2.43 | 2.43 | 2.43 |
| Pygmy rabbit | Short-term habitat disturbance (acres) | 10.21 | 13.55 | 14.1 |
| | Long-term Overhead Lines (miles) | 0.57 | 0.80 | 0.80 |
| | Long-term Habitat Loss (acre) | 0.69 | 0.97 | 0.97 |
| Greater sage-grouse | Short-term habitat disturbance (acres) | 440.13 | 372.23 | 335.03 |
| | Long-term Overhead Lines (miles) | 24.61 | 21.52 | 19.66 |
| | Long-term Habitat Loss (acre) | 29.83 | 26.08 | 23.80 |
| Raptors | Short-term habitat disturbance (acres) | 272.97 | 338.46 | 293.62 |
| | Long-term Overhead Lines (miles) | 15.3 | 17.90 | 16.16 |
| | Long-term Habitat Loss (acre) | 18.55 | 21.70 | 19.59 |
| Mountain Plover | Short-term habitat disturbance (acres) | 11.38 | 10.19 | 10.19 |
| | Long-term Overhead Lines (miles) | 0.67 | 0.85 | 0.85 |
| | Long-term Habitat Loss (acre) | 0.81 | 1.03 | 1.03 |

**Table 4-8. BLM Seasonal Wildlife Stipulations.**

| Species | Pinedale RMP Stipulation |
|---|---|
| Greater sage-grouse | No surface-disturbing activity within 0.25 mile of an occupied lek from 8 p.m.–8 a.m., March 1–May 15;<br>No surface-disturbing activity within 2 miles of an occupied lek to protect nesting habitat March 15–July 15;<br>No surface-disturbing activity within identified winter habitat November 15–March 15 |
| Mountain plover | No surface-disturbing activity within nesting area April 10–July 10, buffer determined on case-by-case basis |
| Burrowing owl | No surface-disturbing activity within a 0.5-mile radius of an active nest April 1–August 15 |
| Bald eagle | No surface-disturbing activity within a 1-mile radius of an active nest February 1–August 15;<br>No surface-disturbing activity within a 1-mile radius of a winter roost November 1–April 1 |
| Ferruginous hawk | No surface-disturbing activity within a 1-mile radius of an active nest March 1–July 31 |
| Colorado River cutthroat trout | No work can occur within stream channels with habitat June 1–August 15 |

*Mountain Plover*

Mountain plover may be impacted by increased predation rates if common ravens or raptors use the new structures for nesting or hunting perches in or near plover nesting sites. Approximately 11.38 acres of mapped plover habitat along Segments 5, 6, and 7 would be temporarily impacted by Alternative 1 (Tables 4-6 and 4-7). Since BLM timing stipulations and surface use restrictions for mountain plover would be enforced, no significant impacts would be expected (Table 4-8).

*Sagebrush-obligate Birds*

Crushing and removal of sagebrush habitat would temporarily impact sagebrush-obligate birds, including greater sage-grouse, sage sparrow, sage thrasher, and Brewer's sparrow. Loggerhead shrike also uses sagebrush, but will use other habitat types. The total short-term impacts to Wyoming big sagebrush habitat for all segments of Alternative 1 would be approximately 679.94 acres. Wyoming big sagebrush habitats may take 30 to 100 years or longer to reach pre-disturbance productivity levels and wildlife habitat complexity (see Section 4.2.1.1). Since most of the impacts to sagebrush would be temporary, although slow to return to mature status, and there is an abundance of this habitat type in the Project Area, the impacts from the transmission line would not be significant.

*Greater Sage-grouse*

Greater sage-grouse breeding habitats are composed of leks, nesting, and early brood rearing habitats. The PFO RMP maps suitable nesting and brood rearing habitats as the area within 2 miles of occupied leks. Some areas within 2 miles of leks are likely to lack vegetation characteristics necessary for nesting and brood rearing, and areas outside of the 2-mile buffer may be used by sage-grouse. However, "suitable habitat" based on vegetation and

documented use has not been mapped for the Project Area, so nesting and brood rearing habitat was assumed to include areas within a 2-mile radius around each active lek. Overall, Alternative 1 would temporarily impact approximately 440.13 acres of potential habitat within 2 miles of leks (Table 4-6 and Table 4-7).

Segment 6 would pass within 1 mile of six occupied sage-grouse leks. Three of these leks, located in the Yellowpoint Complex, have special management requirements in the PAPA FSEIS (BLM 2008b). The PAPA FSEIS states that if year-round development is approved, year-round development will only occur within 1 mile of one of the designated key greater sage-grouse leks at any time.

There is a No Surface Occupancy (NSO) stipulation within 0.25 mile of sage-grouse leks on BLM-administered land. In addition, surface-disturbing activities are restricted during breeding and nesting season (Table 4-8). BLM timing stipulations and surface use restrictions would be enforced for sage-grouse; therefore, impacts would be minimized.

In addition, portions of Segments 2 and 3, as well as the Paradise Substation, are within the Daniel Sage-grouse Core Area, as designated by Wyoming EO 2008-2. The EO provides Stipulations for Development in Core Sage-Grouse Population Areas (State of Wyoming 2008e), including designing aboveground towers to minimize raptor perching and siting transmission lines over 0.5 mile from the perimeter of occupied sage grouse leks.

Long-term impacts to sage-grouse may occur from loss of suitable habitat and the indirect behavioral changes resulting from new overhead structures. Recent studies indicate that sage-grouse avoid vertical structures, possibly due to increased concentration or composition of raptors using the structures as perches (Holloran and Anderson 2005). Research shows that this habitat avoidance encompasses approximately a 1-kilometer band centered on the powerline (Braun 1998). As a result, it is expected that construction of the transmission line across sagebrush stands would alter the utilization of the habitat (fragment) by sage-grouse and possibly other sagebrush obligate species. Alternative 1 would produce effects from the addition of 24.61 miles of new overhead structures and lines, and approximately 29.83 acres of potential habitat loss.

As result of these project effects on sage-grouse, moderate adverse impacts to the local population would be anticipated. Adoption of mitigation measures and stipulations would be recommended.

*Pygmy Rabbit*

Pygmy rabbits also use sagebrush habitat and would be temporarily impacted by crushing and removal of sagebrush vegetation along the ROW and at the Jonah Substation. The total temporary effects to the pygmy rabbit habitat mapped along the Alternative 1 ROW and at the Jonah Substation would be approximately 10.21 acres. Long-term impacts could arise from loss of 0.57 acre of suitable habitat and increased predation along 0.69 mile of overhead powerlines. This may result in adverse affects to pygmy rabbits.

*Fish*
Sensitive fish species could be indirectly impacted by pollution, sedimentation, and water depletions. However, no water depletion would be associated with the Project and no stream impacts (e.g., sedimentation or erosion issues) would be expected with mitigation measures in place to protect water resources. The Alternative 1 would result in the transmission line spanning riparian habitats, but support poles would be placed outside of these habitats and most maintenance activities should occur outside of these habitats as well. Additional measures would be implemented during maintenance actions to ensure fish habitats would not be degraded. Therefore, Alternative 1 would not affect bluehead sucker, flannelmouth sucker, or Colorado River cutthroat trout in the Project Area or downstream.

*Riparian Species*
Crushing of riparian habitat may temporarily and indirectly impact sensitive species, including trumpeter swan, white-faced ibis, peregrine flacon, long-billed curlew, and northern leopard frog. Trumpeter swan, white-faced ibis, and peregrine falcon are unlikely to occur in the Project Area except for foraging if they are migrating though. Therefore, these species would not be expected to be impacted by vegetation disturbance. Sensitive birds may also be directly impacted by increased fatalities due to electrocutions and collisions with transmission lines where they occur in riparian areas. Expected adverse impacts to riparian species would be minor.

#### 4.2.4.4 Alternative 2

Alternative 2 would result in short-term direct and indirect impacts to habitat within 44.82 acres of white-tailed prairie dog habitat, 13.55 acres of pygmy rabbit habitat, 372.23 acres of greater sage-grouse buffers, and 10.19 acres of mountain plover habitat, as shown in Tables 4-6 and 4-7. Alternative 2 would slightly reduce impacts to these species compared to Alternative 1. Temporary impacts during construction would include disturbance in 338.46 acres of raptor buffers, resulting in an adverse impact, however seasonal stipulations and other mitigation measures would reduce the impacts to a minor level.

Long-term impacts could arise from loss of 26.08 acres of suitable habitat for the Greater sage-grouse and indirect behavioral effects resulting from the addition of 21.52 miles of overhead structures and transmission lines. This may result in adverse affects to greater sage-grouse.

Wyoming big sagebrush habitat, used by sage-grouse and other sensitive bird species (i.e., sage sparrow, sage thrasher, loggerhead shrike, and Brewer's sparrow), would be temporarily impacted in Segment 2A. Compared to Alternative 1, Segment 2A would impact more habitat within sage-grouse buffers and a portion within the Daniel Sage-grouse Core Area, as designated by Wyoming EO 2008-2. Less sage-grouse habitat occurs within raptor buffers in Segment 2A, resulting in similar levels of impacts compared to Alternative 1. Impacts to prairie dogs would also be the same. Pygmy rabbit habitat has not been mapped along this segment.

The Alternative 2 Paradise Substation A would be within the Daniel Sage-grouse Core Area, as designated by Wyoming EO 2008-2 and described above, resulting in similar impacts compared to Alternative 1. Approximately 15 acres of sagebrush habitat used by sage-grouse

and other sensitive bird species (i.e., sage sparrow, sage thrasher, loggerhead shrike, and Brewer's sparrow) would be cleared for construction of Substation A. After construction, 7 acres would be reclaimed. Substation A would impact more habitat within sage-grouse buffers and the same amount of habitat within raptor buffers compared to Alternative 1. Like Alternative 1, this Alternative would include the location of the new Paradise Substation A within 1 mile of an existing ferruginous hawk nest, resulting in potential indirect adverse impacts.

Since Segment 6A would follow U.S. 191 rather than traverse less developed land, fewer sensitive species are likely to be present in the area, reducing the potential for adverse impacts from the Project. In particular, sage-grouse are likely to already avoid the highway due to traffic and habitat disturbance. Portions of Segment 6A is within the South Pass Sage-grouse Core Area, which extends to the east of U.S. 191. Approximately 82.35 acres of Segment 6A would be within the 2-mile sage-grouse buffer and would be temporarily disturbed. This is significantly less than Alternative 1. Also, this segment is farther from occupied sage-grouse leks than Segment 6. Segment 6A would be greater than 1 mile from occupied leks. Therefore, construction of Segment 6A would result in lower adverse impacts to greater sage-grouse compared to Alternative 1.

Construction would temporarily impact approximately 13.55 total acres of pygmy rabbit habitat, and 10.19 acres of Mountain plover habitat, resulting in minor adverse impacts to the local resource.

#### 4.2.4.5 Alternative 3

As shown in Tables 4-6 and 4-7, Alternative 3 would result in similar or lower adverse impacts to most BLM-listed species. Short-term impacts would include disturbance in 44.82 acres of white-tailed prairie dog habitat, 14.1 acres of pygmy rabbit habitat, 293.62 acres of raptor nest buffer areas, and 10.19 acres of mountain plover habitat. Short-term impacts to greater sage-grouse would be reduced to 335.03 acres, compared with 372.23 acres for Alternative 2, and 440.13 acres for Alternative 1.

Long-term impacts to greater sage-grouse would be reduced, as well, producing 19.66 acres of overhead lines in sage-grouse buffers, and 23.80 acres of long-term habitat loss. In addition, adverse impact to an existing ferruginous hawk nest would be slightly less than the other alternatives.

Alternative 3 would result in minor adverse impacts to BLM-listed species, since not all impacts can be mitigated by seasonal stipulations shown in Table 4-8.

#### 4.2.4.6 Cumulative Impacts

The proposed Project would contribute incremental impacts to existing and future foreseeable projects, including disturbance and long-term loss of sagebrush habitat that is occurring in the Project Area as the result of multiple energy development projects. However, the disturbance from transmission line structures compared to the cumulative effects of oil and gas development is minor. Studies in the Project Area have found that sage-grouse are negatively impacted by oil and gas development, including the associated habitat loss, fragmentation, traffic, and noise (BLM 2008b). The proposed Project would contribute to existing factors

that are causing sage-grouse declines in the area. Potential cumulative impacts to sage-grouse from this and other reasonably foreseeable actions would not be likely to result in significant adverse impacts, providing timing and mitigation stipulations are followed.

#### 4.2.4.7 Mitigation Opportunities

BLM seasonal stipulations for surface-disturbing activities shown in Table 4-8 would be followed for all alternatives (BLM 2008a). Note that the buffer distance for raptors may vary depending on the species involved, prey availability, natural topographic barriers, line-of-sight distances, and other conflicting issues.

In addition to the above seasonal stipulations, the following BLM-recommended mitigation measures (BLM 2008a) would be applied to all alternatives:

- Pre-construction surveys for sensitive raptors and other species would be conducted in areas of potential habitat by a qualified biologist.
- Initiation of the Project should occur within 14 days of plover surveys if plovers are determined to be not present. If an active plover nest is found in the survey area, the planned activity should be delayed 37 days, or one week post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least 7 days.
- USFWS and WGFD consultation and coordination would be conducted for all mitigation activities relating to raptors and threatened and endangered species and their habitats, and all permits required for movement, removal, and/or establishment of raptor nests would be pursued if they meet the requirements of the USFWS Migratory Bird Treaty Act.
- Wherever possible, permanent structures requiring repeated human presence would not be constructed within 1,000 feet (1,400 feet for ferruginous hawks; 2,600 feet for bald eagles) of active raptor nests.
- If while conducting operations, substantial unanticipated environmental effects to listed, proposed, or candidate species are observed (whether effects are direct or indirect), formal consultation with USFWS would be initiated immediately in addition to cessation of all such operations.
- Permanent, high-profile structures would not be constructed within 0.25 mile of an occupied greater sage-grouse lek.
- Facilities would be sited at a sufficient distance from the edge of an occupied greater sage-grouse lek to result in a noise level increase from operating facilities no greater than 10 decibels (dBA) above background (i.e., 39 dBA background + 10 dBA = 49 dBA).

The following mitigation measures would also be applied to all alternatives to protect federally listed and BLM sensitive species during construction and operation of the proposed transmission lines.

- Avoid sensitive biological resources within the ROW. Avoidance areas would be clearly marked with wooden stakes 3 to 4 feet in height, which would be spray painted to indicate avoidance.

- If construction occurs during migratory bird breeding season, a survey for migratory birds (including BLM sensitive bird species) shall be made just prior to construction. Activities would avoid impacts to nests and fledglings.
- Transmission lines would be constructed with avian-safe design standards and perch discouragers used to deter raptor nesting and reduce the risk of raptor electrocutions and collisions that could occur.
- Avoid construction within 1 mile of key sage-grouse leks in the Yellowpoint Complex (Shelter Cabin Reservoir, The Rocks, and South Rocks leks) and such that timing does not conflict with management and mitigation measures.
- Consider Wyoming EO 2008-2, and the Wyoming Stipulations for Development in Core Sage-Grouse Population Areas.

### 4.2.5 Federally Listed and BLM Sensitive Plant Species

#### 4.2.5.1 Impact Criteria

Impacts to special status plant species would occur as direct mortality and destruction of special status plant populations during construction and maintenance activities. Indirect effects on federally listed and BLM sensitive plant species would include potential loss of habitat and temporary disturbance due to construction activities. Loss of suitable habitat could prevent recruitment and colonization of new populations in those areas. Other indirect effects on these species would include impacts from fugitive dust from vehicles that could collect on photosynthetic surfaces and lead to reduced plant vigor, growth, and reproductive success.

Direct and indirect impacts have the potential to occur as a result of temporary disturbances such as grading and leveling of the ground surface to construct the Paradise and Jonah substations.

#### 4.2.5.2 No Action Alternative

Under the No Action Alternative, no additional impacts to federally listed or BLM sensitive plant species would occur other than those previously approved for the Project Area.

#### 4.2.5.3 Alternative 1

Six BLM sensitive and one federally threatened plant species were identified as having potential habitat in the Project Area: meadow pussytoes, Trelease's milkvetch, Cedar Rim thistle, Beaver Rim phlox, large-fruited bladderpod, tufted twinpod, and Ute ladies'-tresses. However, only three of these species have populations that were mapped within the vicinity of the proposed Project Area. The mapped species include Cedar Rim thistle, Beaver Rim phlox, and large-fruited bladderpod. A population of Cedar Rim thistle approximately 0.25 mile from the proposed Jonah Substation is one of the two nearest occurrences of a BLM-sensitive plant to the Project. The closest BLM sensitive species is a mapped population of Beaver Rim phlox that has the potential to be located within the 150-foot ROW along the south/north-running portion of Segment 1. The endangered blowout penstemon has no known habitat or record of occurrence within the Project Area and would not be impacted by the proposed Project.

Temporary surface disturbing activities in Alternative 1 would affect 997.6 acres in the Project Area, resulting in potential direct impacts to some special status plants. Other potential temporary direct and indirect impacts to special status plant species would result from crushing of existing vegetation and compaction of soils from construction and maintenance traffic within the 150-foot ROW and dragging transmission lines through vegetation. Long-term impacts could arise from removal of special status plants during construction of permanent facilities such as substations, transmission structures, and a road.

Based on the potential for BLM sensitive plant species to occur within the construction corridor, the proposed Project could impact sensitive species; however, pre-construction surveys would be conducted to identify any suspected or unknown areas where special status plant populations exist. Any rare plant populations identified during pre-construction surveys would be avoided during construction of the Project by marking and placing fencing around the identified populations. All results from pre-construction surveys would be provided to BLM specialists immediately following completion of surveys. As a result, Alternative 1 would have no direct effect on any BLM sensitive species, and it likely would not cause a trend to federal listing or a loss of viability of any sensitive plant species.

In known occupied Ute ladies'-tresses habitat, the USFWS recommends that the BLM use management actions that are compatible with protection and conservation of pollinators of the Ute ladies'-tresses orchid. Although potential habitat may exist in the Project Area for Ute ladies'-tresses within riparian areas, Alternative 1 would not take place in riparian habitat suitable for this species. Pre-construction surveys would identify the presence of this species and any found populations would be avoided. Therefore, Alternative 1 would have no effect on Ute ladies'-tresses or on designated habitat of listed species.

#### 4.2.5.4 Alternative 2

No known or mapped populations of special status plant species exist along any of the alternative segments or substation alternatives. No additional impacts would occur to sensitive plants resulting from any of the alternative segments (Segments 1A, 2A, 4A, and 6A) and substation (Substation A) compared to Alternative 1, providing the appropriate mitigation measures, including field surveys and avoidance tactics for special status plant species found within the Project Area, are followed.

#### 4.2.5.5 Alternative 3

No known or mapped populations of special status plant species exist along any of the alternative segments or substation alternatives. No additional impacts would occur to sensitive plants resulting from any of the alternative segments (Segments 1B, 4B, and 6B) and substation (Paradise Substation B) compared to Alternative 1, providing the appropriate mitigation measures, including field surveys and avoidance tactics for special status plant species found within the Project Area, are followed.

Although potential habitat may exist in the Project Area for Ute ladies'-tresses within riparian areas, Alternative 3 would not be constructed in riparian habitat suitable for this species. Pre-construction surveys would identify the presence of this species and any found populations would be avoided. Therefore, Alternative 3 would have no effect on Ute ladies'-tresses or on designated habitat of listed species.

#### 4.2.5.6 Cumulative Impacts

Cumulative impacts to federally listed or BLM sensitive plant species would not be anticipated because the species would be avoided during construction operations if they are found within the Project ROW and would not be affected as a result of Alternative 1.

#### 4.2.5.7 Mitigation Opportunities

The following measures are recommended to protect federally listed and BLM sensitive species during construction, operation, and maintenance of the proposed transmission lines.

- Known populations of sensitive plant species would be avoided. Populations within the ROW should be fenced and clearly marked with wooden stakes 3 to 4 feet in height, which would be spray painted to indicate avoidance.
- If federally listed or BLM sensitive plants are discovered during pre-construction or construction surveys, operations at the site would stop and the BLM would be contacted. Project activities would avoid areas where sensitive plants exist and/or have been discovered.
- Individuals or populations of sensitive plant species that are found within the Project ROW during pre-construction and construction surveys would be fenced and clearly marked and avoided during final project design, utility pole placement, and general construction activities.
- The Proposed Project would be designed and locations selected to avoid disturbances to known blowout penstemon populations, and if the avoidance of adverse affects is not possible, the BLM would re-initiate consultation with the USFWS. Project activities would not be authorized closer than 0.25 mile from any known blowout penstemon populations without concurrence of the USFWS and the BLM authorized officer. No activities would be authorized within 0.25 mile of any known blowout penstemon populations during the essential growing season time period (from April 15 to September 15, the growing, flowering and fruiting stages) to avoid impacts to this species.
- In the event that a new population of blowout penstemon is found, the USFWS Wyoming Field Office (307-772-2374) would be notified within one week of discovery.
- The Proposed Project would be designed and locations selected to avoid disturbances to known Ute ladies'-tresses populations, and if the avoidance of adverse affects is not possible, the BLM would re-initiate consultation with the USFWS. Project activities would not be authorized closer than 0.25 mile from any known Ute ladies'-tresses populations without concurrence of the USFWS and the BLM authorized officer. No activities would be authorized within 0.25 mile of any known Ute ladies'-tresses populations during the essential growing season time period (from July to September, the growing, flowering and fruiting stages) to avoid impacts to this species.
- For the protection of Ute ladies'-tresses and its potential habitat, surface-disturbing activities listed above, should be avoided in the following areas when they occur outside of the protective 0.25-mile buffer from populations of the orchid: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells,

and wetlands; and (c) areas within 100 feet from the inner gorge of ephemeral channels.

### 4.2.6 Wildlife and Fish Resources

#### 4.2.6.1 Impact Criteria

Most impacts would result from loss of seasonal forage habitat and other characteristics that contribute to habitat quality. These changes in wildlife and fisheries habitat and/or habitat quality can be caused directly or indirectly by project activities such as crushing or removal of existing vegetation, compaction of soils from construction and maintenance traffic, disturbance from noise and human activity, and increased erosion and sedimentation of streams and water resources.

Criteria for determining significance of adverse impacts to wildlife and fish resources include loss of habitat value for habitats defined by WGFD as Vital or High. For habitats classified as Moderate, no significant adverse impacts would occur as long as no net loss of habitat value occurs after restoration or other mitigation.

Although other big game species would be affected by the Project, pronghorn may be disproportionately affected. Since the Project would potentially affect pronghorn more than other species, the analysis will consider the threshold for loss of habitat for pronghorn crucial winter and crucial winter/year-long range of greater than 9.38% (60 acres per square mile of available habitat) to be an indicator of significant adverse impacts, per WGFD criteria for Vital or High value habitats. Miles and acres of long-term disturbance within pronghorn migration corridors and bottleneck areas will also be used as an indication of adverse impacts, shown in Map 4-2.

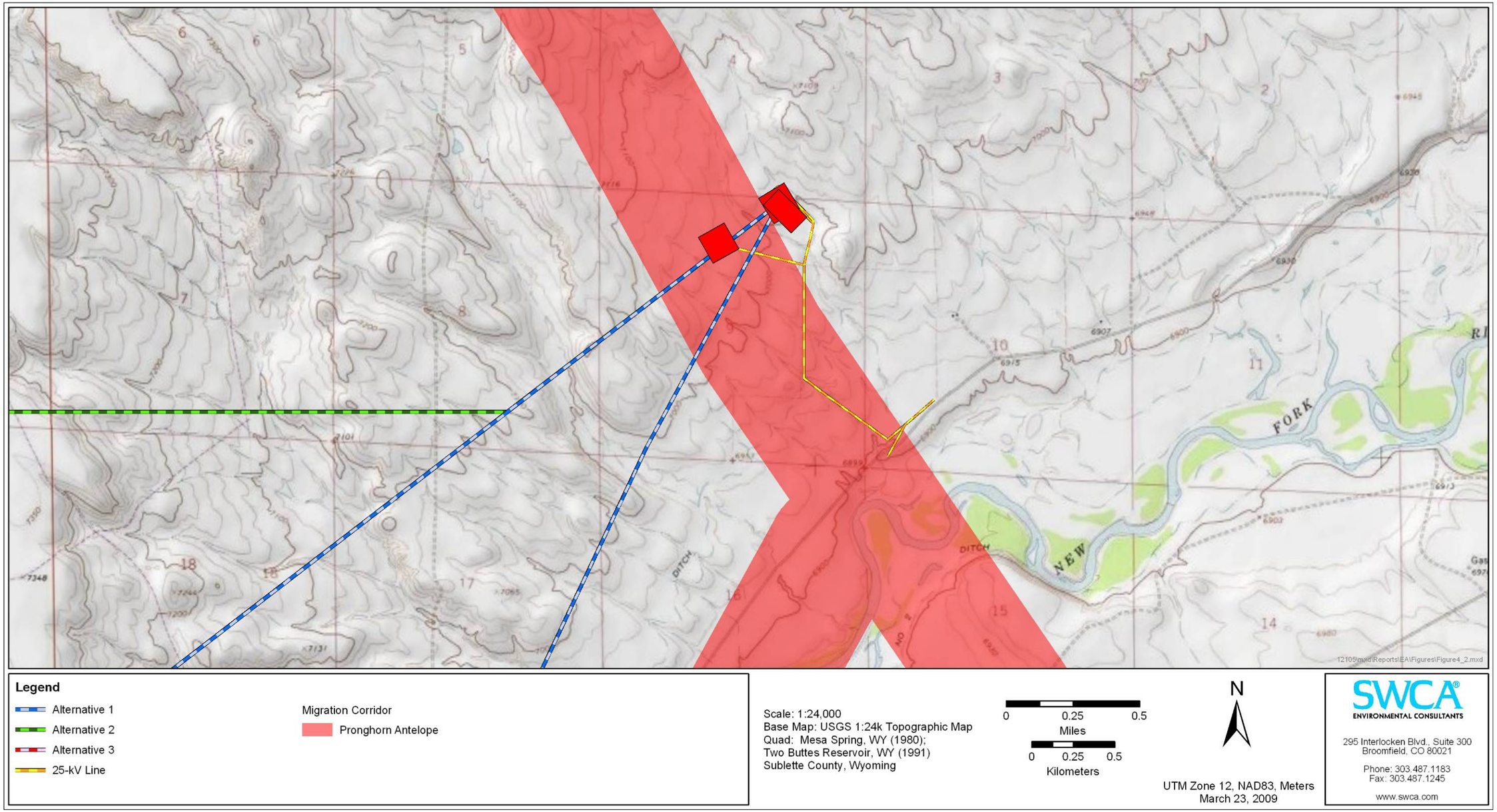
#### 4.2.6.2 No Action Alternative

There would be no impacts on wildlife and fish resources if the high voltage transmission line is not built.

#### 4.2.6.3 Alternative 1

The Green River and associated riparian areas would be crossed by the west end of Segment 2. The New Fork River and associated riparian areas would be crossed by Segment 4. Other than these two river crossings, affected habitat would primarily be upland big sagebrush steppe.

Minimal long-term impacts to wildlife overlapping the 150-foot-wide alignment ROW would be expected. Permanent loss of habitat would occur only from displacement of vegetation by transmission poles.




**Map 4-2. Effects of Alternatives within Pronghorn Migration Corridors.**

Potential increase of the human population in the region may result in increased disturbance to wildlife. These potential impacts include, but are not limited to, increased opportunity for poaching/hunting, disturbance from increased OHV use and other recreational activities, and increased traffic on existing paved roadways crossing important range habitats and migration corridors.

*Big Game*

The proposed Project lies within seasonal use ranges and migration corridors for big game species, as shown in Map 4-2 and Table 4-9. Although some minimal effects to other big game species may occur, most effects to big game range would occur to pronghorn.

Temporary displacement effects on big game may occur, and minimal long-term habitat loss would be expected once construction and remediation are complete, as species are expected to return to their historic ranges and use patterns. Potential effects of the alternatives on pronghorn migration corridors are shown in Map 4-2. Disturbance of big game during migration, including pronghorn, may lead to hastening of migration and possibly result in increased stress and energetic expenditure. Disturbance during occupancy of crucial winter range may result in higher densities in other areas of crucial winter range and use of non-crucial range (i.e., suboptimal habitat), decreased foraging opportunities, and increased risk of mortality (Hayden-Wing 1980; Morgantini and Hudson 1980). No designated parturition areas for any big game species are in or immediately adjacent to the Project Area.

*Pronghorn*

Alternative 1 would result in temporary disturbance 443.15 acres of pronghorn crucial winter and crucial winter/year-long range. The impacts would be adverse for the herd, however not significant given the large area of the herd unit, and the ability of the species to travel long distances. The Sublette North Herd covers approximately 10,700 square miles and has a relatively stable annual survival rate. Construction disturbance would be temporary and with appropriate BMPs and reclamation, native winter forage should return within three to five years.

Permanent disturbance in pronghorn crucial winter and crucial winter/year-long range would occur at the substations, power poles, and along the two-track road. A total of 38.76 acres of long-term loss of habitat would occur from Alternative 1, which represents 4.37% of the 887.2-acre total pronghorn crucial winter and crucial winter/year-long range available in the Project Area. The long-term loss of habitat is below the threshold for long-term significant impacts of 9.38%, based on WGFD guidance for Vital or High Priority wildlife species. This indicates that the impact would not be significant. Alternative 1 also crosses approximately 15.70 miles of pronghorn migration corridor shown in Map 4-2, which would potentially affect the local pronghorn population. In addition, the proposed Paradise Substation location would result in loss of 6.92 acres to the location of permanent facilities within a recognized pronghorn migration bottleneck, resulting in long-term adverse impacts.

The combined direct project effects on pronghorn habitat with Alternative 1 would result in adverse indirect impacts from short-term loss of forage in crucial winter range and disruption of migrations during construction of the Project, and adverse long-term indirect impacts from permanent facilities within a migratory corridor. The impacts would not be significant.

**Table 4-9. Potential Effects on Big Game Habitat, by Alternative.**

| Project Segment | Big Game Range | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|---|
| 1 | Pronghorn CWYL | 108.86 acres<br>6.40 miles | 111.49 acres<br>6.55 miles | 109.15 acres<br>6.41 miles |
| | Pronghorn WYL | 17.97 acres<br>1.08 miles | 17.97 acres<br>1.08 miles | 17.97 acres<br>1.08 miles |
| | Pronghorn SSF | 58.04 acres<br>3.42 miles | 58.04 acres<br>3.42 miles | 58.04 acres<br>3.42 miles |
| | Pronghorn migration corridor | 31.57 acres<br>1.86 miles | 23.46 acres<br>1.38 miles | 32.00 acres<br>1.89 miles |
| | Mule Deer W | 6.63 acres<br>0.38 mile | 6.63 acres<br>0.38 mile | 6.63 acres<br>0.38 mile |
| | Mule Deer SSF | 177.97 acres<br>10.49 miles | 180.61 acres<br>10.64 miles | 178.27 acres<br>10.51 miles |
| | Elk WYL | 184.86 acres<br>10.89 miles | 187.50 acres<br>11.04 miles | 185.16 acres<br>10.91 miles |
| | Moose CWYL | 18.78 acres<br>1.10 miles | 18.78 acres<br>1.10 miles | 18.78 acres<br>1.10 miles |
| 2 | Pronghorn CW | 130.94 acres<br>7.80 miles | 140.14 acres<br>8.41 miles | 131.10 acres<br>7.80 miles |
| | Pronghorn SSF | 56.46 acres<br>3.31 miles | 84.62 acres<br>4.97 miles | 56.46 acres<br>3.31 miles |
| | Pronghorn migration corridor | 8.24 acres<br>0.50 mile | 5.97 acres<br>0.51 mile | 8.40 acres<br>0.51 mile |
| | Mule Deer CW | 71.36 acres<br>4.21 miles | 113.06 acres<br>6.66 miles | 71.36 acres<br>4.21 miles |
| | Mule Deer WYL | 23.32 acres<br>1.40 miles | 23.32 acres<br>1.40 miles | 23.32 acres<br>1.40 miles |
| | Mule Deer W | 11.23 acres<br>0.65 mile | 11.23 acres<br>0.65 mile | 11.23 acres<br>0.65 mile |
| | Mule Deer SSF | 81.48 acres<br>4.85 miles | 77.14 acres<br>4.66 miles | 81.64 acres<br>4.85 miles |
| | Elk WYL | 3.64 acres<br>0.20 mile | 3.64 acres<br>0.20 mile | 3.64 acres<br>0.20 mile |
| | Moose CWYL | 24.76 acres<br>1.45 miles | 24.76 acres<br>1.45 miles | 24.76 acres<br>1.45 miles |
| 25-kV line | Pronghorn CW | 24.08 acres<br>1.82 miles | 23.55 acres<br>1.44 miles | 23.11 acres<br>1.82 miles |
| | Pronghorn migration corridor | 15.99 acres<br>0.95 mile | 18.75 acres<br>1.16 miles | 15.99 acres<br>0.95 mile |
| | Mule Deer SSF | 24.08 acres<br>1.82 miles | 23.55 acres<br>1.44 miles | 23.11 acres<br>1.82 miles |
| Paradise Substation | Pronghorn CW | 6.92 acres | 6.92 acres | 6.65 acres |
| | Pronghorn migration corridor | 1.90 acres | 6.92 acres | 0.69 acre |
| | Mule Deer SSF | 6.92 acres | 6.92 acres | 6.65 acres |

| Project Segment | Big Game Range | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|---|
| 3 | Pronghorn CW | 89.16 acres<br>5.33 miles | 90.83 acres<br>5.33 miles | 89.49 acres<br>5.33 miles |
| | Pronghorn migration corridor | 29.06 acres<br>1.73 miles | 29.41 acres<br>1.74 miles | 29.75 acres<br>1.74 miles |
| | Mule Deer SSF | 89.16 acres<br>5.33 miles | 90.83 acres<br>5.33 miles | 89.49 acres<br>5.33 miles |
| 4 | Pronghorn CW | 17.29 acres<br>1.00 mile | 20.81 acres<br>1.22 miles | 19.23 acres<br>1.13 miles |
| | Pronghorn SSF | 1.74 acres<br>0.09 mile | 1.74 acres<br>0.09 mile | 6.00 acres<br>0.4 mile |
| | Mule Deer WYL | 9.24 acres<br>0.53 mile | 10.62 acres<br>0.62 mile | 13.75 acres<br>0.80 mile |
| | Mule Deer SSF | 9.79 acres<br>0.57 mile | 11.93 acres<br>0.69 mile | 11.48 acres<br>0.67 mile |
| | Moose CWYL | 10.91 acres<br>0.63 mile | 10.44 acres<br>0.60 mile | 11.75 acres<br>0.69 mile |
| 5 | Pronghorn CW | 65.90 acres<br>3.88 miles | 65.90 acres<br>3.88 miles | 65.90 acres<br>3.88 miles |
| | Pronghorn SSF | 50.39 acres<br>2.95 miles | 50.39 acres<br>2.95 miles | 45.80 acres<br>2.68 miles |
| | Pronghorn migration corridor | 18.99 acres<br>1.11 miles | 18.99 acres<br>1.11 miles | 18.99 acres<br>1.11 miles |
| | Mule Deer WYL | 13.49 acres<br>0.78 mile | 13.49 acres<br>0.78 mile | 8.90 acres<br>0.51 mile |
| | Moose CWYL | 2.32 acres<br>0.12 mile | 2.32 acres<br>0.13 mile | NA |
| 6 | Pronghorn SSF | 202.80 acres<br>11.93 miles | 271.25 acres<br>15.96 miles | 271.25 acres<br>15.96 miles |
| | Pronghorn migration corridor | 119.80 acres<br>7.05 miles | 9.18 acres<br>0.53 mile | 11.06 acres<br>0.64 mile |
| 7 | Pronghorn SSF | 87.77 acres<br>5.16 miles | 87.77 acres<br>5.16 miles | 87.77 acres<br>5.16 miles |
| | Pronghorn migration corridor | 10.17 acres<br>0.60 mile | 10.17 acres<br>0.60 mile | 10.17 acres<br>0.60 mile |
| Jonah Substation | Pronghorn SSF | 7.00 acres | 7.00 acres | 7.00 acres |

CW = crucial winter
CWYL = crucial winter/year-long
SSF = spring/summer/fall
W = winter
WYL = winter/year-long

*Small Mammals*

Small mammals may be affected by construction activities of Alternative 1. Individuals within riparian zones of the Green and New Fork rivers may experience temporary disturbance when the transmission lines are strung across the rivers. However, there would be no in-water work and little disturbance to the riparian areas as the poles would be placed with consideration for minimizing impacts to the riparian zone.

Construction activities identified in Appendix A would disrupt wildlife use of the sagebrush habitat within the immediate work vicinity. However, this temporary dislocation should not result in significant impacts to small mammal populations. Mortality of fossorial (burrowing) mammals may occur as those species may be less able to disperse from construction activities.

Increased electricity potential related to Alternative 1 may increase the human population in the Big Piney area. Significant adverse impacts to small mammals would not occur as a result of Alternative 1.

*Reptiles and Amphibians*

Similar impacts to upland reptile species and the Great Basin spadefoot may occur as described for small mammals. Individuals within riparian zones of the Green and New Fork rivers would experience some temporary disturbance when the transmission lines are strung across the rivers. Construction and maintenance of the transmission line within the alignment could temporarily dislocate lizards and snakes in the immediate work vicinity, if present. This temporary dislocation should not affect herptile populations or their prey within sagebrush or riparian habitats in the Project Area. Significant adverse impacts to reptiles and amphibians would not occur as a result of Alternative 1.

*Birds – Non-special Status Species*

Construction of the Project would result in the temporary loss of big sagebrush habitat now available to birds for nesting, predator avoidance cover, and foraging. These impacts would be temporary once construction and reclamation were complete. Permanent loss of sagebrush habitat would occur at the substations, individual pole locations, and two-track roads associated with the Project. The long-term loss of vegetation is not likely to affect habitat value to non-special status bird species.

Perch- and nest-discouraging devices would be used to reduce the use of poles and cross arm structures by birds that require trees, or suitable tree-like surrogates, for a nesting substrate. Raptor nests have been identified throughout the Project Area, but are generally concentrated in three distinct areas: along the New Fork River corridor; in the vicinity of Ross Ridge/North Alkali Draw south of SH 351; and near Segment 7 along Yellow Point Ridge/Sand Draw and surrounding area.

The proposed Project includes the use of line visibility devices to reduce the potential for bird collisions with structures, transmission lines, grounding wires, and guy wires, and potential injury or mortality from electrocution. The risk of electrocution to perching and migratory birds has been minimized over the years by designing insulators and conductors to preclude birds from perching on the conductors. Waterfowl are typically more prone to collisions with powerlines, especially the grounding wires located at the top of the structures (Meyer 1978;

James and Haak 1979; Beaulaurier 1981; Beaulaurier et al. 1982; Faanes 1987). Raptors are less likely to collide with the powerlines, perhaps due to their excellent eyesight and tendency to not fly at dusk or in low visibility weather conditions (Olendorff and Lehman 1986). Smaller migratory birds are at risk, but are generally not as prone to collision because of their small size, their ability to quickly maneuver away from obstacles, and the fact that they often migrate high enough above the ground to avoid transmission lines. Permanent resident birds that fly in tight flocks may be at higher risk than other species. The main issues influencing avian mortality from collisions and electrocutions are species-specific factors such as size, age, and agility; environmental factors including the effects of weather on line visibility or activities that either attract or frequently flush birds from an area; and electrical equipment design (Avian Power Line Interaction Committee [APLIC] 2006).

Raptors and other avian species using the transmission corridor may be impacted by traffic in those areas where the transmission line and highways are in close proximity, including mortality from vehicle-animal collision. Rough-legged hawks commonly use utility poles and lines for hunting perches and are known to scavenge road-kill, particularly jackrabbits, along roadways. Highway mortality may be a major factor in winter survivorship of rough-legged hawks (Keran 1981).

Even with some level of direct or indirect impacts to avian species from collisions with structures or cables, and increased electrocution risk, these impacts would be minor to the overall health of the populations in the Project Area with implementation of mitigation measures. Significant adverse impacts to birds would not occur as a result of Alternative 1.

*Aquatic Species*

Fish species could be present in the Green and New Fork rivers crossed by the transmission line. However, there would be no direct impact to either of these rivers. Additionally, construction activities would not be anticipated to deliver sediment to these rivers with implementation of the BMPs. Thus, no impacts to fish resources would be anticipated as the result of construction or operation of Alternative 1.

#### 4.2.6.4 Alternative 2

Alternative 2 would result in temporary disturbance of 470.69 acres of pronghorn crucial winter, crucial winter/year-long, and winter/year-long range. The short-term impacts would be adverse to the local pronghorn population, but may not be significant due to the large area of the herd unit. Because these short-term impacts can be mitigated by phasing the construction and implementing rapid reclamation and re-seeding of disturbed areas, and the pronghorn herd has a large range available, the impact is not considered significant.

Long-term loss of approximately 39.98 acres, or approximately 4.5%, of available pronghorn crucial winter, crucial winter/year-long, and winter/year-long range by the Project facilities would produce an adverse impact. The impact would be adverse but not significant for the Sublette herd. In addition, Alternative 2 would also result in long-term disturbance from crossing approximately 7.03 miles of pronghorn migration corridor and bottleneck, as shown in Map 4-2. The loss of habitat crucial to pronghorn survival and long-term disruption of migration could result in adverse long-term indirect impact to the local pronghorn population.

Construction of Segment 6A would result in impacts to pronghorn spring/summer/fall range. Approximately 271.25 acres of pronghorn spring/summer/fall range located adjacent to U.S. 191 would be affected. This area has a high degree of habitat alteration and human disturbance and would not have a significant adverse affect on the pronghorn population. Upon completion of construction activities, the transmission line would have no significant adverse effects on the pronghorn population.

As a result, the construction of Alternative 2 would produce adverse short-term and long-term impacts to pronghorn which may be significant unless mitigated.

Effects of Alternative 2 on other wildlife and aquatic species would be similar to Alternative 1 and would not result in significant adverse impacts.

#### 4.2.6.5 Alternative 3

Alternative 3 would result in temporary disturbance of 455.95 acres of pronghorn crucial winter, crucial winter/year-long, and winter/year-long range. Long-term loss of approximately 39.97 acres, or approximately 4.5%, of available pronghorn crucial winter, and crucial winter/year-long range would occur as a result of implementation of Alternative 3. The impact of this long-term habitat loss is considered adverse, but not significant, based on WFGD guidelines. In addition, long-term disturbance would occur from crossing approximately 7.44 miles of pronghorn migration corridor which would affect the local pronghorn population. In addition, the proposed Paradise Substation location would result in permanent facilities outside of a recognized pronghorn migration bottleneck, resulting in lower impacts than Alternatives 1 and 2. The combined direct project effects on pronghorn habitat with Alternative 3 would result in minor impacts to pronghorn population. This alternative would not result in significant adverse impacts to wildlife.

#### 4.2.6.6 Cumulative Impacts

Reasonably foreseeable future actions in the Project Area that would impact wildlife include oil and gas exploration and mineral resource extraction, road construction, residential development, recreation, wildlife species management and hunter harvests, and livestock grazing. Surface disturbance and habitat fragmentation has occurred and will increase over time in varying degrees with continuing energy exploration, development, and production activities, increases in human population, and other activities. Although some species have habituated to human presence, additional disturbance would likely cause new behavioral adaptations, movement, and/or avoidance of activity areas on a temporary basis.

Adverse cumulative impacts to all wildlife species would result from further habitat fragmentation and habitat loss.

- Minor cumulative impacts to small mammals would result from road and site construction, vehicle traffic, and human and noise disturbance, and are cumulative to other projects in and adjacent to the Project Area.
- No cumulative impacts to reptiles and amphibians would be anticipated since all cumulative projects would be subject to BMPs and BLM standard stipulations that would protect water resources and other specialized habitats. Possible minor

cumulative effects to migratory birds may result in decreased local migratory bird abundance, decreased local biodiversity, altered food webs, and possible contributory impacts on regional avifaunal diversity as a result of habitat loss, habitat fragmentation, and habitat conversion.

- Minor cumulative impacts to raptors may occur from past and present actions that may include decreased nesting habitat and decreased available prey, although surface use restrictions and seasonal restrictions around raptor nests would mitigate most impacts.
- Required Storm Water Pollution Protection measures, BMPs, and BLM standard stipulations that would protect water resources would protect fish downstream of the Project Area. No cumulative impacts would be anticipated.

#### 4.2.6.7 Mitigation Opportunities

The following mitigation opportunities may offset adverse effects of the Project:

- Activities and surface use would not be allowed within big game crucial winter range from November 15 to April 30. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the BLM AO.
- Raptor nest surveys would be conducted before commencement of surface-disturbing activities within a 0.5- to 1.0-mile radius of surface use or activity areas if activities are proposed to be conducted between February 1 and July 31.
- No surface-disturbing activities would occur within 0.5 mile of active nests (defined as having been occupied within the past three years) of non-sensitive raptor species from February 1 to July 31. Buffer distance may vary depending on the species involved, prey availability, natural topographic barriers, line-of-sight distances, and other conflicting issues. Linear disturbances, such as the proposed Project, may be granted exceptions if analysis of the disturbance concludes no adverse effects to the nesting individuals.
- Where the proposed line would interrupt existing raptor nest platforms, platforms would be relocated to adjacent optimal habitat within ROW constraints.
- As necessary, the appropriate authorities (Wyoming Department of Transportation on highways and WGFD or BLM on rural and county roads) would be notified of the presence of roadside carrion and asked to remove the carrion as soon as possible. Carcasses may be covered in the interim to discourage scavenging by raptors, but only authorized personnel may touch or remove the carcasses.
- If areas are identified by BLM data as having specific raptor nesting concerns, perch discouragers would include designs that discourage nesting on structures. Structures outside of these identified sensitive areas would be left without any perch discouragers as research shows that perch deterrents are most effective when alternative perching areas are available.
- In river crossings or wetland areas, three spans on either side would include bird flight diverters (design to be discussed) installed on the high neutral.
- Distribution lines and/ or underbuild would be built to raptor-safe specifications (60 inches horizontal spacing).

- Mechanically graded areas would be seeded with a predetermined seed mix identified by the BLM to restore the grass and forbs in the disturbed big sagebrush habitat. Weed control measures would also be implemented to reduce the spread of non-native/invasive plant species that may diminish big game foraging habitat in areas disturbed by construction.
- A 7-foot-high wildlife-proof fence would be used around the perimeter of the 8.0-acre substations.

### 4.2.7 Noxious, Non-Native, and Invasive Plant Species

#### 4.2.7.1 Impact Criteria

Project impacts related to noxious, non-native, and invasive plant species are generally indirect. Noxious weeds and invasive plants can be introduced and become established in areas disturbed by construction, vehicle traffic, road maintenance, and topsoil removal. Establishment of noxious weeds leads to displacement of native species and shifts in plant community composition and ecosystem functioning. The resulting changes in the plant community can alter wildlife habitat, reduce the quality of wildlife and livestock forage, weaken ecosystem function, and create a shift in fire frequency and behavior.

Impacts to vegetation communities would be significant if there were a long-term increase in noxious weeds and other non-native species that contributes to unsuccessful revegetation of affected portions of the Project Area. This includes the permanent loss of vegetation, the introduction of noxious or invasive plants into areas that were previously free of weeds, and/or an increase in noxious or invasive species where they already exist. Any species included on the Sublette County and/or state of Wyoming noxious weed lists would be of primary concern, especially if the proposed Project introduces new noxious weeds or spreads noxious weeds into areas that were previously clear of noxious weeds.

Although vegetation would be restored in areas requiring reclamation within the first five years after construction activities, resulting in no long-term surface disturbance impacts, the pre-disturbance vegetation composition, density, or production would not be achieved for many years (BLM 2008a). If integrative weed management practices and prompt reclamation recommendations are not followed, noxious/invasive plants could adversely impact vegetation communities and wildlife habitat.

#### 4.2.7.2 No Action Alternative

Under the No Action Alternative there would be no additional impacts to vegetation from noxious weeds within the Project Area. However, the No Action Alternative may allow present populations of noxious weeds to persist or increase as no additional weed monitoring or management efforts would occur.

#### 4.2.7.3 Alternative 1

Construction of the transmission lines for this Project would include direct and indirect impacts associated with staging areas for construction materials, the movement of equipment during installation (dragging transmission lines through vegetation) of the transmission line, and heavy construction vehicle traffic and increased traffic volumes within the construction corridor. The direct impacts within the Project Area would include the crushing and

compaction of vegetation within the transmission line ROW which could increase the potential for the spread of noxious/non-native plant species; however, the chance of invasive species spreading and taking over is less than if the vegetation were removed and the soil disturbed. The introduction of invasive species into areas that originally had only native species would be an indirect impact that could result from construction of the proposed Project. Invasive species could be introduced during project construction and maintenance and would be brought in by workers (clothing and shoes) and unwashed vehicles and heavy equipment. The introduction of invasive species could also occur from livestock and wildlife that may pass through disturbed areas within the Project Area.

These direct and indirect impacts would also occur at and around the construction sites of the Jonah and Paradise substations. The impacts at these sites would include the direct impact of permanent vegetation and habitat loss, as well as indirect impact of increasing the potential for noxious/non-native plant introduction and invasion. These sites would be most at risk of non-native species invasion because the vegetation would be cleared from the site.

Under Alternative 1, impacts would be both temporary and permanent in nature. Approximately 991.32 acres of native vegetation, as shown in Table 4-10, would be damaged as a result of vehicles and heavy equipment moving through the 150-foot ROW during construction of the transmission line. Crushing of native vegetation and equipment operation increases opportunities for noxious plant infestation and spread. This increase in opportunity would result in adverse impacts from non-native plant increases.

**Table 4-10. Effects of Surface Disturbance on Native Plants, by Alternative.**

| Project Segment | Alternative 1 (Acres of Surface Disturbance) | Alternative 2 (Acres of Surface Disturbance) | Alternative 3 (Acres of Surface Disturbance) |
|---|---|---|---|
| 1 | 171.26 | 174.06 | 171.55 |
| 2 | 168.73 | 212.38 | 168.89 |
| Paradise Substation and 25-kV line | 16.67 | 23.49 | 23.66 |
| 3 | 95.53 | 97.29 | 95.90 |
| 4 | 13.44 | 15.42 | 18.06 |
| 5 | 124.57 | 124.57 | 119.65 |
| 6 | 216.00 | 289.74 | 289.32 |
| 7 | 110.00 | 94.00 | 93.99 |
| Jonah Substation | 15.00 | 15.00 | 15.00 |
| Pull and Tension Sites | 60.12 | 80.71 | 64.14 |
| **Total** | **991.32** | **1,126.66** | **1,060.16** |

No clearing and grading of vegetation would take place to create pulling/tensioning stations and/or equipment staging areas which would minimize the opportunities for invasive species to spread. All of the transmission line construction activities would be located within the 150-foot ROW. Through construction of the Jonah and Paradise substations, approximately 14

acres of temporary ground disturbance and 16 acres of permanent ground disturbance would result through clearing and grading. Because limited clearing and/or grading would take place along the transmission line ROW and providing equipment is washed prior to entering new areas, invasion of non-native species would be expected to be minimal and of short duration. Reclamation following BLM standards should also help minimize impacts related to non-native species invasion.

#### 4.2.7.4 Alternative 2

The types of direct and indirect impacts would be the same for all of the alternatives as Alternative 1, but would differ in the amount of acreage impacted. Table 4-10 shows the comparison of impacts between Alternative 1and each of the proposed alternatives.

This alternative would result in 1,126.66 acres of native vegetation disturbance, producing an increased adverse impact compared to Alternative 1. This would be exacerbated by the additional opportunity of non-native seeds and plants to be spread from the proximity of U.S. 191 and the South Anticline Road.

Since the effects of vegetation disturbance can be mitigated with the use of BMPs, no long-term adverse impact would be anticipated from this alternative.

#### 4.2.7.5 Alternative 3

Alternative 3 would result in 1,060.16 acres of native vegetation disturbance, producing an adverse impact intermediate between Alternatives 1 and 2. This would be exacerbated by the additional opportunity of non-native seeds and plants to be spread from the proximity of U.S. 191 and the South Anticline Road.

Since the effects of vegetation disturbance could be mitigated with the use of BMPs, no long-term adverse impact would be anticipated from this alternative.

#### 4.2.7.6 Cumulative Impacts

The cumulative impacts study area for vegetation includes the entire Project Area and the adjacent Anticline and Jonah fields. Existing activities in this area include historical and ongoing oil and gas development, ranching and grazing, and any proposed or reasonably foreseeable developments and activities. These activities have all contributed to the removal of native vegetation, and an increase in invasive and noxious weed species in the area. Adverse impacts to vegetation from oil and gas development in the study area have occurred as a result of past and ongoing development. Heavy use of roads in the Project Area by industrial traffic has also led to the increase in non-native plant species.

Reclamation and revegetation efforts would be required for all areas of temporary disturbance within the Project Area. These efforts typically involve recontouring and planting native grasses and monitoring for noxious weeds for several years following reclamation. This often results in increased dominance of herbaceous vegetation and a general decrease in the shrub stratum, at least temporarily. Providing reclamation and the appropriate mitigation measures are followed, Alternative 1 would not contribute cumulatively to an increase in non-native species within the Project Area.

4.2.7.7 Mitigation Opportunities

The Operator would conduct all surface activities in accordance with the BLM Manual 9015 - Integrated Weed Management, the Pinedale RMP (BLM 1987, 2008a), and the Rock Springs RMP (BLM 1997a). Materials and methods must be approved in advance by the AO. Mitigation measures to be incorporated would include the following.

- Conduct pre-construction surveys in the spring for noxious weed infestations within the site boundaries and along access roads.
- Consult with BLM and Sublette County Weed and Pest Control to determine treatment for noxious weeds, if identified.
- Construction vehicles and equipment would be cleaned, power-washed, and free of soil and vegetation debris prior to entry and use of access roads to prevent transporting weed seeds.
- All seed mix, erosion control materials, and reclamation materials would be certified weed free.
- Revegetated areas would be monitored for at least three years following seeding to evaluate the need for supplemental seeding and noxious weed control.
- The ROW and other disturbed areas would be monitored for noxious weed infestations, and new or expanding populations would be controlled or eradicated for the duration of the construction, operation, and reclamation phases.
- The presence of designated weeds in the Project Area requires that the Operator develop and implement management measures to prevent the spread of noxious weeds and install a monitoring system for a minimum of three years.

## 4.3 HUMAN ENVIRONMENT

### 4.3.1 Livestock and Range Resources

4.3.1.1 Impact Criteria

Wildlife and domestic animals depend upon rangeland for food and habitat. Livestock grazing is a primary land use of the Project Area, with approximately 90% of the Project Area being in a portion of a grazing allotment. Impacts would occur throughout the Project Area as a result of loss of forage. Livestock forage is affected by vegetation and soil disturbance, reclamation success, weed control, road construction and use (i.e., dust and animal/vehicle collisions) that result in varying degrees from project activities.

Impacts to livestock grazing would be significant if project activities precluded livestock grazing use of the Project Area for the long term, if there were a reduction in AUMs that would require modification in grazing allotments, or other actions that would prevent the realization of grazing management goals, or if project activities resulted in a violation of BLM RMP or other land use plan goals/objectives.

Indirect impacts to rangeland resources would include displacement of livestock; damage to rangeland improvements including fences, cattle guards, water wells, and water impoundments; increased competition with wildlife; loss of palatability of vegetation from road dust; livestock losses due to vehicle collisions; and the spread of noxious weeds.

Disturbance of soils and increased vehicle activity would increase the introduction, establishment, and spread of undesirable non-native/noxious weed species. This can reduce forage availability and animal weight gains, in addition to affecting trail routes and overall animal health. The introduction of halogeton is of particular concern to grazing resources since it is lethally toxic to sheep and cattle. Proper reclamation of disturbed sites would help reduce these potential impacts.

The movement of heavy trucks, auguring equipment, heavy construction equipment, and temporary staging and construction sites creates the potential for damage to range improvements. Damaged cattle guards and fences could allow livestock to move into non-permitted areas, leading to potential resource conflicts and displacement and concentration of animals could cause excessive grazing pressure on vegetation that cattle would not normally graze. Loss of livestock is possible if vehicle collisions and the resulting mortality increase with development of the proposed transmission line and substations.

#### 4.3.1.2 No Action Alternative

Under the No Action Alternative, no additional impacts to rangeland resources other than those previously approved for the Project Area would occur.

#### 4.3.1.3 Alternative 1

Impacts to AUMs on the grazing allotments within the Project Area are presented by each alternative in Table 4-11. Construction of the Segments described for Alternative 1 would result in both direct and indirect impacts. Direct impacts would be the short-term loss of available forage during construction activities. Although available forage would be reduced during construction, it would be reclaimed as soon as feasible. Most of the vegetation removed or damaged throughout the Project Area would be short-term.

A long-term loss of forage would occur due to construction the Jonah and Paradise substations (16 total acres of Wyoming big sagebrush habitat). The Paradise Substation is proposed in the Mesa Common grazing allotment and would result in 8 acres (0.65 AUM) of permanent vegetation loss. The Jonah Substation is proposed in the Boundary grazing allotment of the RSFO and would also result in a permanent vegetation loss of 8 acres (0.91 AUM), thus a total of 16 acres (1.56 AUMs) would be lost to the construction of the two substations.

For Alternative 1, the transmission line would cross through nine BLM allotments: Blue Rim Desert, Blue Rim Individual, Boundary, Marincic Mesa, Mesa Common, Muleshoe, Northwest Square Top Individual, Piney Bridge, and Stud Horse Common. The proposed Project has a short and temporary construction period and the reduction in AUMs of livestock forage is expected to be minimal and short-term in affected allotments. Vegetation along the extent of the transmission line would not be removed, but would be impacted by vehicle and equipment activity within the 150-foot ROW during construction and maintenance activities.

Under Alternative 1, approximately 800.26 acres of vegetation within all of the nine grazing allotments combined would be subject to surface disturbance from construction and maintenance activities. Alternative 1 would produce the lowest total AUM impact of the alternatives, affecting 71.10 AUMs. Mesa Common, Stud Horse Common, and Boundary

allotments would be the most affected by this alternative. Alternative 1 would result in the lowest overall effect to grazing leases compared with the other action alternatives.

**Table 4-11. AUM Effects on Livestock and Range Resources, by Alternative.**

| Proposed Segment | Allotment | Alternative 1 Temporary Disturbance (Acres) | Alternative 2 Temporary Disturbance (Acres) | Alternative 3 Temporary Disturbance (Acres) |
|---|---|---|---|---|
| 1 | Muleshoe | 125.33<br>8.24 AUMs | 117.84<br>7.75 AUMs | 125.45<br>8.25 AUMs |
| | Piney Bridge Individual | 8.92<br>0.50 AUM | 4.52<br>0.26 AUM | 8.38<br>0.47 AUM |
| 2 | Mesa Common | 99.17<br>8.06 AUMs | 104.43<br>8.49 AUMs | 99.33<br>8.08 AUMs |
| | Marincic Mesa Individual | 61.97<br>3.60 AUMs | 94.05<br>5.47 AUMs | 61.97<br>3.60 AUMs |
| Paradise Substation and 25-kV | Mesa Common | 10.83<br>0.88 AUM | 10.29<br>0.84 AUM | 9.58<br>0.78 AUM |
| 3 | Mesa Common | 82.96<br>6.74 AUMs | 84.64<br>6.88 AUMs | 83.29<br>6.77 AUMs |
| 4 | Blue Rim Desert | 0 | 0 | 2.08<br>0.15 AUM |
| | Mesa Common | 0.23<br>0.02 AUM | 0.23<br>0.02 AUM | 0.23<br>0.02 AUM |
| 5 | Blue Rim Individual | 83.66<br>6.64 AUMs | 83.66<br>6.64 AUMs | 83.66<br>6.64 AUMs |
| | Blue Rim Desert | 29.67<br>2.12 AUMs | 29.67<br>2.12 AUMs | 28.04<br>2.00 AUMs |
| 6 | Northwest Square Top Individual | 38.11<br>4.33 AUMs | 83.36<br>9.47 AUMs | 83.36<br>9.47 AUMs |
| | Blue Rim Individual | 60.11<br>4.77 AUMs | 52.30<br>4.15 AUMs | 52.49<br>4.17 AUMs |
| | Stud Horse Common | 100.86<br>14.01 AUMs | 123.21<br>17.11 AUMs | 123.21<br>17.11 AUMs |
| | Boundary | 3.67<br>0.42 AUM | 12.35<br>1.40 AUMs | 12.35<br>1.40 AUMs |
| 7 | Boundary | 87.77<br>9.97 AUMs | 87.77<br>9.97 AUMs | 87.77<br>9.97 AUMs |
| Jonah Substation | Boundary | 7.00<br>0.80 AUM | 7.00<br>0.80 AUM | 7.00<br>0.80 AUM |
| **Total Acres Disturbance** | | **800.26** | **895.32** | **868.19** |
| **Total AUM Impact** | | **71.10 AUMs** | **81.37 AUMs** | **79.68 AUMs** |

#### 4.3.1.4 Alternative 2

The types of direct and indirect impacts would be the same for all of the alternatives as Alternative 1, but would differ in the amount of acreage impacted. Table 4-11 shows the comparison of impacts between Alternative 1 and each of the proposed alternatives. Alternative 2 would result in the largest effect to grazing in terms of acres of total disturbance and AUM impacts. Approximately 895.32 acres of construction disturbance would occur as a result of the Project, with impacts to 81.37 AUMs.

The same nine allotments would be affected by Alternative 2, with the highest area of effect occurring in the Stud Horse Common, Mesa Common, Boundary, and Blue Rim Individual, and Northwest Square Top Individual allotments.

#### 4.3.1.5 Alternative 3

Alternative 3 would have very similar effects on allotments as Alternative 2, although the amount of acreage impacted would be slightly lower, as shown in Table 4-11. Alternative 3 would result in approximately 868.19 acres of construction disturbance affecting approximately 79.68 AUMs.

The same nine allotments would be affected by Alternative 3, compared with Alternatives 1 and 2. Stud Horse Common, Mesa Common, Boundary, Blue Rim Individual, and Northwest Square Top Individual allotments would be the most affected by this alternative.

#### 4.3.1.6 Cumulative Impacts

The study area for grazing resources is the total area of the nine allotments that overlap the Project Area. Existing activities in this area include historical and ongoing oil and gas development, ranching and grazing, and any proposed or reasonably foreseeable developments and activities. These activities have all contributed to the removal of forage in each of the allotments, and an increase in invasive and noxious weed species in the area.

The cumulative impact of forage loss in all nine allotments would be less than 1% of total AUMs allotted for all allotments, but would only be short-term. As a result, the proposed Project would not contribute significant impacts to rangeland resources compared to existing development within the area.

#### 4.3.1.7 Mitigation Opportunities

BMPs would include implementing an intensive reclamation and weed control program beginning the first growing season after each segment of project completion. Any range improvements directly impacted by the proposed Project would be repaired or relocated as directed by the AO. Other recommended mitigation includes the following:

- Develop on-site and off-site stock water facilities throughout the affected grazing allotments to aid in directing stock use to appropriate areas. Coordinate with Jonah Interagency Office to protect and enhance water well projects.
- Establish wildlife friendly cross-fencing in allotments to protect livestock.
- Monitor reclamation as it applies to forage and AUMs.

### 4.3.2 Socioeconomic Resources

#### 4.3.2.1 Impact Criteria

Impacts to socioeconomic resources would result from the effects of construction dollars and workers on local economy and social conditions. Significant short-term adverse impacts would be significant if the projected increases in demand for local government facilities or services outstrip the capacity of institutions; and/or if the increase in demand for non-traditional housing such as hotels outstrips the availability. Short-term beneficial impacts would result from increases in generated tax revenue due to additional workforce in the county.

Effects of long-term operations on local, state, and national economy could also produce socioeconomic impacts. Significant long-term impacts may occur from changes to the property values near the transmission lines or substation. In addition, significant indirect long-term economic impacts may come from increased industrial, commercial, and residential growth in the county.

#### 4.3.2.2 No Action Alternative

There would be no impacts on socioeconomics of the region if the high voltage transmission line is not built. Under the No Action Alternative, no temporary/permanent jobs related to construction and operation of a new transmission line and substation would be created. Furthermore, increased energy demands of the gas field would not be met, limiting the natural gas production in the area. As such, associated increases in population, employment, housing demands, and tax revenue would not result if the transmission line and substation are not built. Electrical supply to the region would continue to be unpredictable, resulting in outages and frequent voltage fluctuations for end users. It is anticipated that the town of Pinedale would continue to experience at least one power outage per year.

#### 4.3.2.3 Impacts Common to All Alternatives

Alternatives 1 and 2 would support energy development in the area by increasing available electricity for industrial support for regional energy development, as well as increase electrical reliability for growing commercial and residential areas. The socioeconomic impacts for these alternatives would be expected to be very similar, as they would serve the Project purpose and need of supplying energy to the region.

*Population*

In general, the direct socioeconomic effects of added power lines and substations on a county-wide scale are expected to be relatively small. Construction and operation of the proposed new high-voltage substation and 230-kV overhead transmission line would add one full-time, permanent job at Rocky Mountain Power. Additionally, a small workforce would be expected to temporarily relocate to Sublette County during the construction phase (see “Employment, Housing, and Infrastructure” discussion below). Therefore, direct impacts to population from Alternative 1 would be negligible.

The Paradise 230-kV line would add the capability to serve an additional 265 Mw of load to the current capacity of the system in Sublette County, thereby meeting immediate customer requests (plus an additional 25 to 50 Mw of service requests). Current requests for power

service by the proposed Paradise 230-kV line include both large transmission-voltage delivery requests and requests for service at distribution-voltage levels, as shown in Table 4-12. The provision of adequate and reliable power to the region could enable additional commercial, industrial, and residential growth to the county, thereby indirectly increasing population in the region. Sublette County is already amongst the fastest growing counties in the nation.

**Table 4-12. Anticipated Rocky Mountain Power Electrical Loads Serviced by the Proposed Project.**

| Customer[1] | Type of Service Requested | Maximum Load Requested |
|---|---|---|
| A | Transmission | 59 Mw |
| B | Transmission | 18 Mw |
| C | Transmission | 9 Mw |
| D | Transmission or Distribution | 70 Mw |
| E | Transmission or Distribution | 25 Mw |
| F | Distribution | 8 Mw |
| G | Distribution | 1 Mw |
| H | Distribution | 10 Mw |
| I | Distribution | 11 Mw |
| J | Distribution | 4 Mw |
| Total Contracted Requests as of November 2008 | | 215 Mw |
| Anticipated Additional Requests to be served by the Paradise 230-kV Project | | 25–-50 Mw |
| Total Capacity of the Paradise 230-kV Project | | 265 Mw |

[1] Customer names are withheld due to the confidential nature of customer applications.
Source: Rocky Mountain Power, personal communication with Claudia Oakes, SWCA, November 12, 2008.

*Employment, Housing, and Infrastructure*

As discussed above regarding direct impacts to population, increased employment from Alternative 1 would be very small; only one permanent long-term job would be added by Rocky Mountain Power and the temporary, short-term construction workforce would expectedly be relatively small over the construction period (Table 4-13).

Jobs presented in Table 4-13 represent total personnel required for each construction phase; the same construction personnel could be used for multiple activities, therefore these numbers do not reflect total employment.

The temporary workforce would be expected to come from local and non-local communities, though non-resident workers would likely dominate the temporary workforce. The resident workforce would remain in the county, while non-local workers would require temporary housing in Sublette County. Non-resident workers would likely occupy non-traditional housing (i.e., hotels) during their stay and it is unlikely their families would accompany them. Given the relatively small size of the construction workforce, it is expected that existing

housing facilities should be able to adequately provide for temporary accommodations. Therefore, no direct impacts to housing would be expected.

**Table 4-13. Construction Jobs for the Proposed Project.**

| Construction Phase | Number of Jobs |
|---|---|
| Substation | |
| Site preparation | 4 |
| Yard construction | 7 |
| Equipment installation | 10 |
| Overhead line tie-in | 4 |
| Substation energizing | 4 |
| Site restoration and stabilization | 3 |
| **Subtotal** | **32** |
| Transmission Line | |
| Survey | 3 |
| Equipment transportation | 6 |
| Pole setting | 6 |
| Conductor installation | 10 |
| Sagging, clipping, dead-ending | 6 |
| Reclamation | 4 |
| **Subtotal** | **35** |
| **Total construction jobs** | **67** |

Construction of the proposed Project could foster additional commercial, industrial, and residential growth in the county. However, research indicates that although an adequate and reliable source of electricity can make a region like Sublette County attractive for new business opportunities, the provision of adequate and reliable electricity alone does not attract new jobs to an area. Additional electricity, combined with infrastructure improvements, additional oil and gas energy project development, a skilled workforce, and affordable housing options together increase opportunities for potential employment growth; thereby indirectly increasing the demand for employment and housing in the county.

Housing growth in the county has historically lagged behind population growth by roughly 50% (Jacquet 2005) in large part because new home construction costs are restrictively expensive in the region for most median wage earners. An influx of potential residents and workers as a result of increased industrial and commercial growth in the region could further, though indirectly, increase the existing housing shortage.

Some concerns have been expressed regarding the potential effects of the action alternatives on property values along the project corridor. While average housing sales prices have increased 200.2% since 1998 in Sublette County, there is the potential for the action alternatives to affect property values. No quantitative analysis regarding the potential impacts on property value was conducted for this Project. Previous research results are wide ranging, as some studies report no effects on property values, while other studies report very small effects, and other studies report serious effects on property value (Seesholtz 2004). In general,

the following findings are common: properties directly adjacent to the line are more likely to be affected; impacts to property values, if any, decrease over time; and the overall reduction in property values for single-family residential properties is typically 2 to 10% (Kroll and Priestly 1992).

Private development for housing and industrial siting is concentrated in pockets of private land along the New Fork River and U.S. 191. Only a small percentage (3.6%, or 5.4 miles) of private land is adjacent to the proposed lines; therefore, impacts to property values, if any, are expected to be negligible, based on the above study findings (Kroll and Priestly 1992).

*Quality of Life/Cost of Living*

As discussed previously, short-term employment from construction is expected to increase demand for non-traditional units (i.e., motels) more than traditional housing, and direct employment for operation and maintenance of the line and substation would add a single worker; therefore, direct impacts to the cost of living are not expected. However, Sublette County already suffers from severe local workforce shortages and a high cost of living. Therefore, increases in industrial, commercial, and residential growth could indirectly increase the demand for housing in the region, and therefore indirectly add to the current housing shortage and increase the cost of living even further.

The non-resident regional workforce has increased since 1998; with this workforce expansion, the county has experienced significant increases in traffic accidents and arrests (Jacquet 2005). Additionally, there is a reported decrease in retail and entertainment businesses locally over the same time period because the cost of living is so high and retail and entertainment jobs tend to pay below the median income (Jacquet 2005). The result is that the quality of life for residents in the county has been changing as the influx of non-local residents change the regional lifestyle. As with employment, housing, and infrastructure, an influx of potential workers could further, though indirectly, increase the already high cost of living.

*Taxes and revenue*

Alternative 1 would likely result in direct and indirect economic benefits associated with increased industrial, commercial, and residential growth in the county. Direct benefits would result from material procurement for construction and associated sales taxes on those materials. Indirect benefits would include increased spending from increased oil and gas production, as well as increased lodging taxes from non-resident workforce spending on hotels and motels. Mineral severance and property taxes on production would also grow indirectly as a result of increased industrial activity in the oil and gas industry.

Communities such as Pinedale, Marbleton, and Big Piney would benefit from the economic activity generated by the purchase of services, manufactured goods, and equipment from local businesses. The majority of spending would be expected to occur in Sublette County. Spending on materials purchased within Sublette County would be subject to sales tax; a small percentage of these revenues would be distributed back to the local economy. Other state and local tax payments and fees would be incurred as a result of the transmission line construction. In addition to tax revenue generated for state and local governments, the action alternatives would also generate lease rental revenue for the federal government through PILT made to BLM.

If one of the action alternatives is implemented for the Project, Rocky Mountain Power revenue and kWh sold are expected to grow. Contracted requests for electricity may fluctuate in an economic downturn, but local requests for electrical service appear solid (see Table 4-12). Revenue from the Paradise 230-kV line would be based on the prices charged to customers, which are regulated by the Wyoming Public Service Commission. These charges vary according to the voltage-delivery level of service provided to the customer (transmission or distribution), the amount of capacity that Rocky Mountain Power provides to each customer, and the usage characteristic of the customer. Although kWh sales decreased between 2003 and 2004, sales increased between 2004 and 2008. Thus, kWh sales and operations revenue are both expected to increase, similar to historic trends, if one of the action alternatives is implemented.

*Cumulative Impacts*

Socioeconomic conditions in the region could be cumulatively affected by past, present, and future projects that contribute to the economy, increase employment (temporarily or permanently), increase the demand for public services, and/or change tax revenue. Existing and future oil and gas developments, such as the Jonah Gas and Pinedale Anticline Fields, as well as associated industrial, commercial, and residential development will cumulatively contribute to increased population, supply and demand on housing and employment, and increased taxes and revenues to governments. Local communities would experience the economic impacts of more consumption of local goods and services, and increased sales tax revenues. Actual impacts would depend on the number and size of future energy projects and the rate of development. Action alternatives associated with this Project would not be expected to significantly add to the cumulative social and economic impacts of energy development in the region.

*Mitigation Measures*

No mitigation measures have been proposed to offset impacts to socioeconomics under the action alternatives.

### 4.3.3 Recreation

#### 4.3.3.1 Impact Criteria

Management objectives for recreation resources for both the PFO and RSFO are to ensure the continued availability of diverse outdoor recreational opportunities sought by the public, while protecting other resources; maintain or enhance the health and viability of recreation-dependent resources and settings; mitigate conflicts between recreation and other types of resource uses; accommodate existing land uses; and provide for the anticipated recreational uses and use levels in the resource area (BLM 2007b, 2008a).

Short-term impacts to recreation would be considered significant if project development:

- changes the recreation use of the area surrounding the Project Area or result in violation of the BLM RMPs or other land use plan recreation objectives; or
- results in significant construction noise and disturbance on hunting and camping recreators such that it diminishes recreation experience for dispersed hunters using

public lands or diminishes the recreation experience of individuals visiting several campsites around the Project Area.

Significant long-term impacts from construction of the Project may occur if construction:

- effects the visual character of the area such that it diminishes the recreation experience of dispersed hunters, river recreators, and other public land users; or
- diminishes recreation experience of individuals visiting several campsites around the Project Area due to presence of industrial facilities such as transmission line and towers.

#### 4.3.3.2 No Action Alternative

There would be no impacts on recreation resources of the region if the high-voltage transmission line is not built.

#### 4.3.3.3 Alternative 1

Alternative 1 would have the potential to impact recreational activities and experience within the Project Area. Direct impacts to recreation resources would occur within the Project Area and would include noise created from construction activities and visual impacts from the added presence of a transmission line and associated towers across the landscape. These features would substantially alter the visual setting and hence impact the recreational user experience. Indirect impacts to recreation would include increased traffic in localized areas along the Project Area during construction activities and the potential for wildlife displacement and impacts to hunting activities if construction occurs around hunting seasons.

Impacts to the recreation areas surrounding the proposed transmission alignment, shown in Map 3-2, vary depending on the proximity, intensity of recreation use, and existing infrastructure. The Project Area is located on diverse lands that currently consist of a remote setting with little relative disturbance, as well as lands that contain various infrastructure including energy development (such as oil rigs) and transmission lines and towers. As such, some recreation sites within the Project Area already experience an altered natural setting.

The long-term visual impacts would be related to increased contrast and adverse impacts to the existing visual setting. This would be most evident along the Green River Road, Lander Trail crossings, New Fork Campground, and western portion of Segment 5. The setting in the eastern half of Segment 2, an area with few visible intrusions, would be substantially altered.

*Special Recreation Management Areas*

Portions of the Green and New Fork rivers SRMA located within the Project Area would not be impacted by implementation of Alternative 1 or any of Alternative 2.

*Ross Butte Management Area*

The Ross Butte Management Area, which is partially located within the southern section of the Project Area, would not be significantly impacted by Alternative 1 or any Alternative 2.

*Recreation Sites*

The recreation sites that have the potential to be adversely impacted are the South New Fork Bridge Road Access; the New Fork Olson Ranch access area; the New Fork/Ross Butte Fishing Access Area; the New Fork South of 351 Access Area; and the New Fork Campground. Potential impacts to these recreation sites would be indirect and to the recreational experience of the area (including aesthetic environment) and not related directly to the actual recreation site or activity offered. The recreation experience at these sites may be temporarily impacted due to construction activity. Construction of the proposed transmission line and Paradise Substation would also increase the likelihood of human interactions, increase the sights and sounds associated with the human environment such as elevated traffic levels, air pollution, and equipment noise, and create a more altered environment than existing conditions.

Under Alternative 1, there would be no direct impacts to the recreation experience at the South New Fork Bridge Road Access or the New Fork Olson Ranch access area. Indirect impacts would occur from incremental changes to the recreation setting. Alternative 1 would not dominate the view from these access areas, but it would be noticeable from various river float points accessed from here and from nearby dispersed recreation use areas.

Construction activities and placement of the transmission towers and line may impact the surrounding aesthetic environment of the New Fork/Ross Butte Fishing Access Area. Since this area is located 0.3 mile east of the proposed transmission alignment, the transmission route, power poles, and lines may be visible along the skyline. While noticeable to the casual observer, this recreation area is located along SH 351 in an area that has existing disturbance including other powerlines and the degree of change would not be significant.

The New Fork Campground is located adjacent to SH 351 and the proposed transmission route and has the potential to be adversely impacted under Alternative 1. Segment 4 is within the 0.25-mile No Surface Occupancy (NSO) buffer intended to protect the natural setting of the New Fork River Campground. The majority of the impacts would occur during the active phases of construction and would be minimal once completed. Construction activities may impede access to the site in addition to the increased level of noise, traffic, and overall human presence in the area. Long-term direct visual and aesthetic impacts would occur to this recreation site due to the site’s proximity to the transmission poles and lines, which would be visible. The steel monopole double circuit structures would appear tall and contrast against the sky since the new powerline would add a strong vertical element where none existed previously (see Appendix E, Visual Impact Assessment). However, this recreation area is located directly adjacent to an active highway, gravel quarry, and other existing disturbance, including small power lines and buildings. Alternative 1 would add a vertical element to the existing development, impacting the views of recreational users.

Potential indirect impacts of the construction phase to the recreation experience and setting at the New Fork South of 351 Access Area and the New Fork Campground may include access interruptions, additional construction traffic, and construction noise. However, if these impacts are realized, they would be temporary, ceasing once installation is complete in which recreation activities would resume uninterrupted. Any potential remaining impact from implementation of Alternative 1 would be to the northern skyline from the recreation site.

Implementation of Alternative 1 would have the potential to change the skyline view from the recreation site to a less natural setting due to the addition of a vertical transmission line and horizontal towers.

*Fishing and Boating*

Multiple fishing and boating access points are present in the vicinity of the proposed route of the transmission line. Impacts to fishing along the proposed transmission line may occur during active construction phases from temporary noise disturbances and increased vehicle traffic along SH 351, U.S. 189, and U.S. 191. Upon completion of the transmission line, impacts to the fishing experience in the Project Area would be limited to a change in the natural setting due to the presence of the proposed transmission line. No physical constraints to fishing activities would occur; however, in locations where minimal disturbance exists the presence of the transmission line would be more visible.

*OHV Use*

It is unlikely that OHV activities would be affected by the installation of the proposed transmission line. Upon implementation of Alternative 1, it is possible that there would be an increase in motorized vehicle traffic in areas of crushed/cleared vegetation and the additional two-track roads along ROWs.

*Big Game Hunting*

Impacts to hunting activities include disruption of game animals, impacts to access of hunting areas, increased activity due to expanded road network, aesthetics of area due to presence of work activity, and physical appearance of the transmission line. Disturbances, including construction activities, may impact the daily and seasonal movement of animals including birds and big game.

Due to the amount of existing disturbance (such as oil and gas drilling) along SH 351 and U.S. 191, it is unlikely that the installation of the proposed transmission line adjacent to either highway would have a noticeable impact to hunting activities in these locations. Additionally, WGFD hunting regulations do not allow hunting activities along public lands adjacent to roadways, including SH 351, U.S. 189, and U.S. 191. Alternative 1 Segment 2 on The Mesa and Segment 6 would create new ROWs that cross relatively undisturbed lands, thereby introducing new pedestrian access for hunting in the area.

#### 4.3.3.4 Alternative 2

Impacts to recreation sites under some of Alternative 2 would be indirect and affect only the recreational experience of the area (including aesthetic environment) and not related directly to the actual recreation site or activity offered.

The high-voltage powerline would be located approximately 1 mile south of the SH 351 Bridge under Segment 4A. Similar to Alternative 1, the steel monopole double circuit structures would be visible and would contrast against the sky since the new powerline would add a vertical element where none existed previously. However, under this alignment, the powerline and associated towers would appear smaller and therefore less noticeable from the New Fork Campground recreation site (see Appendix E, Visual Impact Assessment). Therefore, Alternative 2, Segment 4A would be less apparent and consequently of lower

impact to recreators at this site. Floaters and boaters who would pass under the river crossing near the campground would be impacted more than individuals staying at the campground. This impact would be the same for all alternatives.

#### 4.3.3.5 Alternative 3

Impacts to recreation sites under some segments of Alternative 3 would be indirect and affect only the recreational experience of the area (including aesthetic environment) and not related directly to the actual recreation site or activity offered.

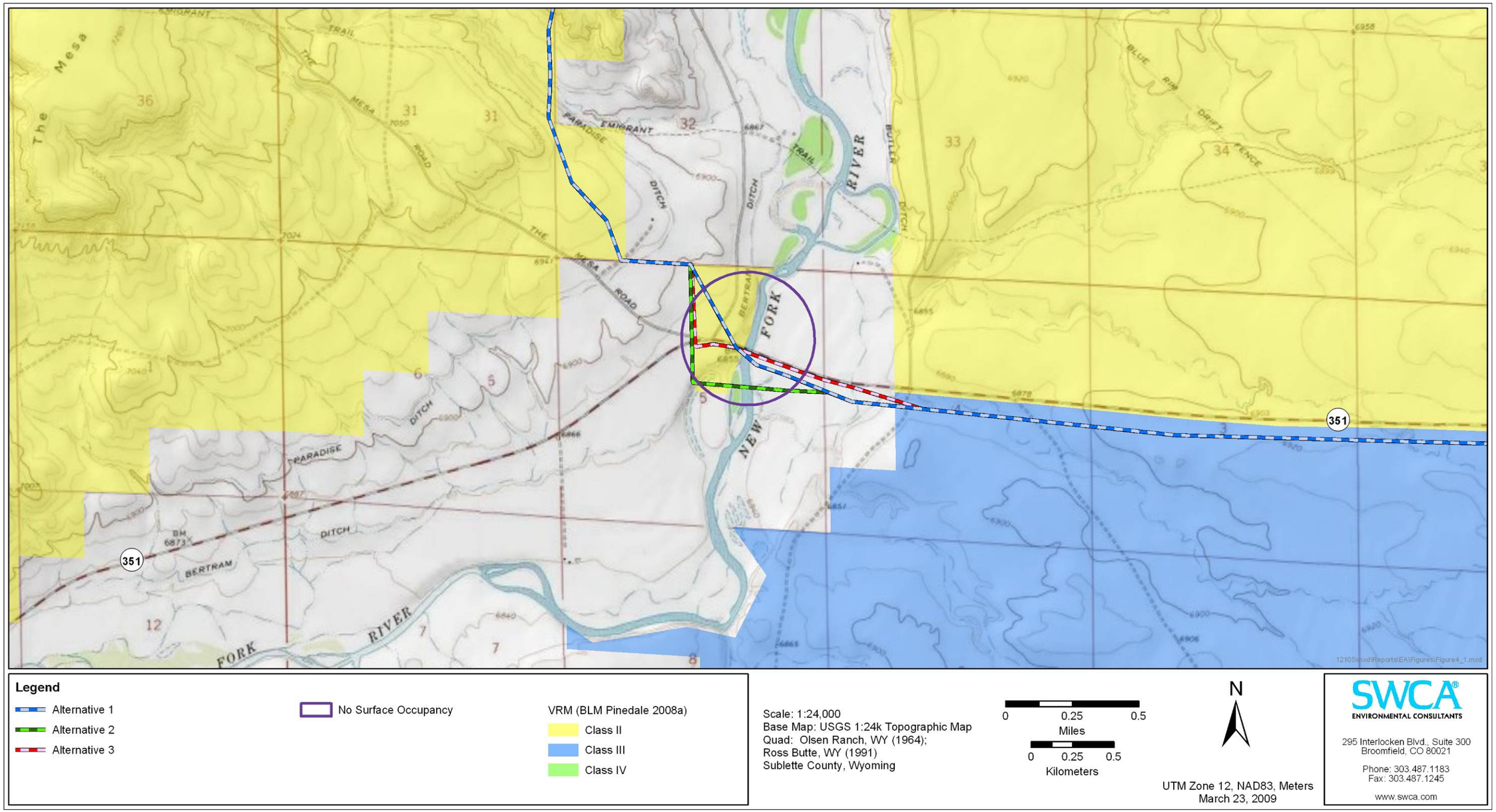
The high-voltage powerline would be located within a few hundred feet of the New Fork Campground recreation site, but would not pass directly ober the campground as in Alternative 1 (Map 4-3). The steel monopole structures would be within BLM's NSO, at the specific request of the landowner. The impact to recreators at this site would be considered adverse since the visibility from the recreation area is out of character with the recreation experience. Floaters and boaters who would pass under the river crossing near the campground would be impacted more than individuals staying at the campground, as with all the alternatives. Mitigation measures designed to improve the recreation experience of visitors could reduce the impacts of Alternative 3 to a level less than significant.

#### 4.3.3.6 Cumulative Impacts

Existing recreation sites and setting in the Project Area could be cumulatively affected by past, present, and future projects that contribute to energy development in the area. Existing and future oil and gas developments, such as the Jonah Infill Drilling Area, Pinedale Anticline Fields, Normally Pressurized Lance Project, as well as associated industrial, commercial, and residential development would cumulatively contribute to increased population. This increase in population may increase the number of recreators using existing recreation sites which has the potential to subsequently reduce the overall recreation experience for many users. Actual impacts would depend on the number and size of future energy projects and the rate of development. Additionally, recreators may avoid areas where new development diminishes their experience and opportunity for enjoyment of natural landscapes and activities.

#### 4.3.3.7 Mitigation Opportunities

Potential compensatory mitigation for impacts within the New Fork Campground NSO area was analyzed in the Visual Impact Assessment (Appendix E). No other mitigation measures are necessary for recreation resources since potential impacts are anticipated to be temporary in nature, such as noise from construction, and would cease once implementation is complete. In addition, any potential impacts realized from implementation of Alternatives 1 or 2 would not occur directly to the recreation site or affect activities offered. Impacts would be limited to the visual setting and mitigation measures are discussed in the visual resource analysis section of this EA.




**Map 4-3. Project Alternatives Relative to New Fork River VRM Classification and No Surface Occupancy Area.**

### 4.3.4 Visual Resources

#### 4.3.4.1 Impact Criteria

For the analysis of impacts to visual resources, impacts would be considered significant if the impacts of the proposed Project do not conform to the designated VRM classifications or management goals within the Project Area. Impacts are also based on visual simulations described in the Visual Impact Assessment (SWCA 2009; Appendix E). The visual simulation is a subjective comparison of the existing landscape with the potential visual contrasts created by a proposed activity, in terms of landscape form, color, line, and texture. The KOPs for assessing impacts to visual resources for the proposed Project are located throughout the Project Area in areas with high scenic quality and visual sensitivity, as shown in Map 3-3. The impacts of the Project at the 18 KOPs are detailed in the Visual Impact Assessment and are summarized in this section.

#### 4.3.4.2 No Action Alternative

Under the No Action Alternative, there would be no additional transmission line along the segments. The current disturbance within the proposed Project Area consists of existing transmission and distribution lines visible in VRM Class II and III areas along Segment 1 and portions of Segments 2 and 6A. The existing infrastructure is visible to casual viewers from KOPs 36, 32, 34, 38, 33, 29, and 8, as shown in Map 3-3 (also see Appendix E, Visual Impact Assessment).

#### 4.3.4.3 Alternative 1

The potential direct adverse impacts to visual resources from Alternative 1 would include the visual contrasts created by construction equipment, temporary clearance areas, poles, powerlines, and the substations. In general, construction vehicles and the surface disturbances associated with installation of the lines would impact scenic quality in the short term with human-made form, color, and line contrasts. The visual impacts from vertical wood H-frame and steel monopoles and horizontal powerlines would create a linear and vertical obtrusion across the landscape that is generally treeless and consists of low topography, and would persist in the long term. The H-frame and steel monopoles would be 80 to 100 feet tall and spaced every 300 to 1,000 feet, depending on topography, final design, and safety requirements (see discussion in Section 2.1.1).

Rocky Mountain Power is proposing to install COR-TEN steel monopoles, a weathering steel that is light rust to dark brown in color. PacifiCorp cannot predict the exact tone of the poles to be used in the Project as the variation in steel color from light rust to dark brown varies with the manufacturer of the poles. Even the individual tones of brown may vary from pole to pole in the Project.

Table 4-14 summarizes the miles and acreages that the proposed ROW would impact within each VRM Class by segment. VRM Class II areas are most sensitive to visual impact. In Alternative 1, 13.87 miles of the proposed transmission line would be within Class II, 20.06 miles within Class III, and 12.52 miles within Class IV managed areas. Temporary crushing of vegetation within this 150-foot-wide ROW would cause little visual impact along the proposed and alternative segments, but the two-track maintenance road would create a long-term visual disturbance. The greatest visual impact from vegetation disturbance would be at

the substations, where bare soils from graded areas would cause visual contrast until vegetation returned to the area.

**Table 4-14. Surface Disturbance for Project Segments and Components by VRM Class.**

| Segments and Components | VRM Class | Mileage | Long-term ROW Disturbance (acres) |
|---|---|---|---|
| 1 | Class II<br>Class III | 1.75<br>5.22 | 2.12<br>6.33 |
| 1A | Class II<br>Class III | 1.76<br>5.37 | 2.13<br>6.51 |
| 1B | Class II<br>Class III | 1.77<br>5.22 | 2.14<br>6.33 |
| 2 | Class II<br>Class III | 7.85<br>1.90 | 9.52<br>2.23 |
| 2A | Class II<br>Class III<br>Class IV | 6.42<br>4.36<br>1.17 | 7.79<br>5.14<br>1.41 |
| Paradise Substation | Class III<br>Class IV | NA | 7.99<br>0.01 |
| Paradise Substation A | Class III | NA | 8.00 |
| Paradise Substation B | Class III | NA | 8.00 |
| 25-kV Distribution Line | Class III | 0.63 | 0.29 |
| 3 | Class II<br>Class III | 3.90<br>1.08 | 4.73<br>1.23 |
| 4 | Class II | 0.37 | 0.45 |
| 4A | Class II | 0.13 | 0.16 |
| 4B | Class II<br>Class III | 0.43<br>0.11 | 0.40<br>0.12 |
| 5 | Class III | 6.67 | 8.08 |
| 6 | Class III<br>Class IV | 4.56<br>7.36 | 5.53<br>8.92 |
| 6A | Class III<br>Class IV | 12.92<br>1.33 | 15.66<br>1.62 |
| 6B | Class III<br>Class IV | 12.92<br>1.33 | 15.66<br>1.62 |
| 7 | Class IV | 5.16 | 6.26 |
| Jonah Substation | Class IV | NA | 8.00 |

Note: Does not include private or state land.

Photo simulations were analyzed in the Visual Impact Assessment (Appendix E) for KOPs along the proposed ROW. Table 4-15 summarizes the results of visual contrast ratings at each KOP and compares the alternative segments and substation. The degree of contrast at each KOP was rated none, weak, moderate, or strong, as defined in BLM Handbook H-8431.

**Table 4-15. Comparison of Visual Contrast Ratings by Alternative and Affected Areas.**

| KOP # | VRM Class | Segment Viewed | Sensitive Viewers | Visual Contrast Rating |
|---|---|---|---|---|
| KOP 36 | III | 1 | Industrial and local traffic | weak |
| KOP 32 | none | 1 | Residents and local traffic | weak |
| KOP 34 | none | 2 | Recreators | moderate |
| KOP 38 | none | 2 | Industrial and local traffic, recreators | moderate |
| KOP 33 | none | 2 | Recreators | weak |
| KOP 29 | II | 2 | Local traffic, residents, recreators | strong |
| KOP 30 | II | 2 | Local traffic and recreators | moderate |
| KOP 35 | II | 2 or 2A | Recreators | 2: weak<br>2A: none |
| KOP 8 | none | 3, Paradise Substation, Substation A, or Substation B | Industrial and local traffic | Substation: moderate<br>Substation A: moderate<br>Substation B: moderate |
| KOP 25 | II | 3 | Residents, recreators | weak |
| KOP 4 | II | 3 | Recreators | moderate |
| KOP 28 | II | 3 | Recreators | weak to moderate |
| KOP 18 | II | 4, 4A, or 4B | Industrial and local traffic, recreators | 4: strong<br>4A: moderate<br>4B: strong |
| KOP 37 | none | 4, 4A, or 4B | Industrial and local traffic, recreators | 4: moderate<br>4A: weak<br>4B: moderate |
| KOP 24 | III | 5 | Recreators | weak |
| KOP 13 | III | 5 | Industrial and local traffic | moderate |
| KOP 6a | III | 6, 6A, or 6B | Regional through traffic, industrial and local traffic | 6: weak<br>6A or 6B: strong |
| KOP 6b | III | 6A or 6B | Regional through traffic, industrial and local traffic | strong |
| KOP 27 | IV | 6A or 6B | Regional through traffic, industrial and local traffic | weak |

Table 4-16 provides a summary of visual impacts anticipated under Alternative 1. Segment 1 is within VRM Class II and III areas that can be seen by travelers along portions of U.S. 189 and SH 351. There is an existing transmission/distribution line along this segment. A portion of the segment would be visible in the distance from the Wardell Bison Trap cultural site and interpretive area located south of SH 351 (see Cultural Resources section). The contrast ratings from KOP 36 and KOP 32 along Segment 1 are weak.

**Table 4-16. Visual Impacts by Alternative.**

| Project Segments | Alternative 1 Visual Impacts | Alternative 2 Visual Impacts | Alternative 3 Visual Impacts |
|---|---|---|---|
| 1 | High visibility from Wardell Bison Trap site. Low visibility from SH 351. | Low visibility from Wardell Bison Trap site. High visibility from SH 351. | Moderate visibility from Wardell Bison Trap site. Low visibility from SH 351. |
| 2 | Within 3 miles of historic trail. | Stays 3 miles away from historic trail. More miles of transmission line along the Green River and Green River Road than Alternative 1. | Same as Alternative 2. |
| Paradise Substation | Visible from Paradise Rd. Close to New Fork River. | Similar impacts compared to Alternative 1. Slightly more visible from Paradise Rd. than Alternative 1 due to topography. | Similar impacts compared to Alternative 1. |
| 4 | High visibility from New Fork River boat launch area. Within 0.25 mile NSO for New Fork Campground and highly visible from SH 351. | Less visible from New Fork River boat launch area compared to Alternatives 1 and 3, but removes the most riparian vegetation. Within 0.25 mile NSO for New Fork Campground and highly visible from SH 351. | Slightly less visible from New Fork River boat launch area compared to Alternative 1. Within 0.25 mile NSO for New Fork Campground and highly visible from SH 351. |
| 6 | Low visibility from U.S. 191. | High visibility from U.S. 191. More miles of transmission line along SH 351 than Alternative 1. | High visibility from U.S. 191. More miles of transmission line along SH 351 than Alternative 1. |

Segment 2 of Alternative 1 is within VRM Class II and III areas that can be seen by travelers along portions of SH 351 and Green River Road. Recreators on the Green River and on the Lander Trail (also known as Lander Road or Lander Cutoff Trail) would have views of Segment 2 at certain points, impacting their recreational experience. This segment crosses Lander Trail near Green River Road then turns northeast and crosses through a VRM Class II area created to protect a 3-mile buffer around the trail. There is an existing transmission line along a portion of Segment 2. The contrast rating varies from the KOPs along Segment 2 (see Table 4-15).

Segment 3 of Alternative 1 follows the west side of the New Fork River floodplain and is within VRM Class II and III areas. The southern portion of the segment crosses the Lander Cutoff Trail. The VRM Class II area was created to protect the New Fork River and a 3-mile buffer around the Lander Cutoff Trail. Recreators on the New Fork River and on the Lander Cutoff Trail would have views of Segment 3 at certain points, impacting their recreational experience.

KOP 28, shown in the photo simulation below, represents the view of visitors to Lander Trail as well as views from nearby residential neighborhoods (Photograph 4-1). Construction equipment and surface disturbance would likely be visible in the short term from this KOP. The powerline and wooden poles would be slightly visible in the long term as a contrasting line and color in the background, as shown in the photo simulation. The impacts to scenic quality for hikers would be adverse and minor, in that some new disturbances and infrastructure would be visible. Due to distance of the structures from the trail marker, the contrast rating from KOP 28 is weak to moderate, depending on the sensitivity of the viewer.

**Photograph 4-1. Simulated view looking northwest across the New Fork River from a historic trail marker (KOP 28 at 263°).**

Segment 4 of Alternative 1 crosses the New Fork River and is on private land with no VRM classification except for the area around the New Fork River Campground, which is VRM Class II. The segment is within the 0.25-mile NSO buffer intended to protect the natural setting of the New Fork River Campground (Map 4-3). The segment can be seen by travelers on SH 351. It can also be seen by recreators on the New Fork River, briefly impacting their recreational experience as they pass under the line. The proposed transmission line would be located where there is currently no infrastructure other than the highway bridge crossing. The contrast rating from KOP 18 at the crossing is strong and from KOP 37 is moderate. Photograph 4-2 shows the simulation of the transmission line as viewed from the campground.

**Photograph 4-2. Simulated view looking west at Segment 4 from the New Fork River Campground (KOP 18 at 164°).**

Segment 5 follows SH 351 within VRM Class II and III areas. The segment would be seen by travelers along the highway. There is existing gas field development along this highway; therefore, the contrast rating from KOP 24 would be weak and KOP 13 would be moderate.

Segment 6 of Alternative 1 would cross VRM Class III and IV areas that can be seen from gas field access roads. The segment is parallel to U.S. 191, approximately 3 miles to the west, and can be seen in the distance by travelers at certain points. KOP 6a in the photograph below simulates the view travelers on U.S. 191 would have of Segment 6 when looking west from their vehicle (Photograph 4-3).

As shown in the photograph, the poles and wires are slightly visible in the background where there is existing disturbance. It is unlikely that an observer driving on U.S. 191 would notice the transmission line in the distance. The visual contrast rating for this KOP is weak due to the distance from the viewer and existing infrastructure at that same distance.

Segment 7 would be located adjacent to the existing Jonah Gas Field and would be seen by industrial workers using undeveloped access roads in the gas field. The area is VRM Class IV. There are no KOPs along this segment since the area has low public use and the visual sensitivity is low.

**Photograph 4-3. Simulated view looking west at Segment 6 from U.S. 191 (KOP 6a at 250°).**

The proposed Paradise Substation would be located in an area that is VRM Class III. The substation can be seen by travelers on Paradise Road. From KOP 8, a low hill slightly hides the lower portion of the substation. The contrast rating from KOP 8 is moderate and from KOP 25 is weak.

The proposed Jonah Substation would be located in a VRM Class IV area. The substation would be adjacent to the existing Jonah Gas Field and would be seen by industrial workers using undeveloped access roads in the gas field. There are no KOPs at the Jonah Substation since the area has low public use and the visual sensitivity is low.

#### 4.3.4.4 Alternative 2

Tables 4-15 and 4-16 compare the visual impacts of Alternative 1 with the segment and substation alternatives.

*Segment 1A*

This segment would follow SH 351 rather than the existing line that deviates from the highway. It would be farther away from the Wardell Bison Trap interpretive site and therefore would have less impact on viewers from that location compared to Alternative 1. However, the existing line, visible from the interpretive site, would remain in place along Segment 1. Segment 1A would follow the highway and would have greater impact on travelers along that portion of the highway compared to Alternative 1.

*Segment 2A*

Segment Alternative 2A would have less impact to recreators on the Lander Cutoff Trail compared to Alternative 1 since it would be outside the 3-mile trail buffer (a VRM Class II area). The transmission line cannot be seen from KOP 35 on the trail at that distance. However, the segment would still cross the trail and there would be more miles of transmission line located along Green River Road. Therefore, there would be more impact on recreators on the Green River and travelers on Green River Road compared to Alternative 1. The contrast rating at KOP 35 is none because Segment 2A would not be visible.

*Substation A*

The visual impacts from Paradise Substation and its alternative location would be similar. The Alternative Substation would be located just west of the proposed substation, but would still be visible from Paradise Road. From KOP 8, the Alternative Substation may stand out to the viewer because the topography does not obstruct the view of the substation; however, the contrast rating would be the same as for Alternative 1. The contrast rating at KOP 8 is moderate and KOP 25 is weak.

*Segment 4A*

The segment can be seen by travelers on SH 351 and by recreators on the New Fork River. The segment is within the 0.25-mile NSO buffer intended to protect the natural setting of the New Fork River Campground. Compared to the other alternatives (Photogragh 4-2), Segment 4A would be less visible from the New Fork River boat launch because it is moved slightly south of the bridge. This alternative would remove more riparian tree and shrub habitat, which could impact visual resources. However, boaters' recreational experience would still be briefly impacted as they pass under the line. The contrast rating from KOP 18 at the crossing is moderate and from KOP 37 is weak.

*Segment 6A*

Since Segment 6A is longer than Alternative 1 Segment 6 and would be located along U.S. 191, there would be more visual disturbance within VRM Class III areas compared to Alternative 1 (Table 4-16). Segment 6A would cross 12.9 miles of VRM Class III land and 1.3 miles of VRM Class IV land. Existing powerlines, described in the No Action Alternative, would remain in place where they are located along the highway. KOPs 6a and 6b in Photographs 4-4 through 4-6 below simulate the view travelers on U.S. 191 would have of Segment 6A from their vehicles. KOP 27 simulates the view travelers on U.S. 191 would have of Segment 6A when driving north.

As shown in the photo simulations, the transmission line is visible as observers drive on U.S. 191 and much more noticeable compared to KOP 6a for Segment 6A. The proposed transmission structures would not impede the view of the observer and the existing landscape is still visible. The new horizontal lines created by the wires would repeat the existing horizon line. The poles create strong vertical lines against the sky, but the sky is not blocked by narrow lines of the new structures. The observer would notice the contrasting structures compared to the flat topography and low growing vegetation, but could still feel connected to existing elements of view. Overall the contrast from KOP 6a is strong.

**Photograph 4-4. Simulated view looking west at Segment 6A from U.S. 191 (KOP 6a at 250°).**

**Photograph 4-5. Simulated view looking south at Segment 6A from U.S. 191 (KOP 6b at 162°).**

**Photograph 4-6. Simulated view from U.S. 191 looking northwest at Segment 6A (KOP 27 at 310°).**

The visual impacts at KOPs 6b and 27 along U.S. 191 are similar to those described for KOP 6a, as shown in the photo simulations. The contrast rating for KOP 6b is strong and KOP 27 is weak. However, the contrast rating would become strong as the traveler drives north of KOP 27 and parallels the transmission line in a VRM Class III area.

4.3.4.5 Alternative 3

Segment 1B would deviate from SH 351, similar to Segment 1. However, it would be slightly north of Segment 1 and therefore less visible from the Wardell Bison Trap site. Segment 1B would be less visible from SH 351 compared to Segment 1A.

Paradise Substation B and the 25-kV line would have visual impacts that are similar to the other substation alternatives.

Segment 4B is within the 0.25-mile NSO buffer intended to protect the natural setting of the New Fork River Campground. It is located between Segment 4 and Segment 4A. Although it is slightly south of Segment 4, it can be seen from the boat launch and would appear similar to Alternative 1 shown in Photograph 4-2. Less riparian vegetation would be removed compared to Segment 4A.

Segment 6B would have visual impacts that are similar to Segment 6A, as it also follows U.S. 191. A small portion of this segment would veer south of SH 351 to avoid well pads.

#### 4.3.4.6 Cumulative Impacts

Cumulative impacts for visual resources would include the proposed project activities, existing power and distribution lines, and activities within the Jonah Gas and Pinedale Anticline fields. Direct cumulative impacts would include a reduction in scenic or visual quality along travel routes that pass through BLM-administered public lands, caused by visible surface disturbances from gas exploration and production, as well as infrastructure associated with the proposed and existing powerlines. The proposed Project would add to the cumulative impacts of increasing development in the area which takes away from the natural, remote landscape. The impacts would be adverse for visual and scenic quality as landform, color, and linear landscape alterations would persist in the long term in this portion of the Project Area.

#### 4.3.4.7 Mitigation Opportunities

VRM class objectives and design considerations have been considered throughout the project planning process. Various alignments and pole materials (i.e., galvanized and COR-TEN steel) were considered in order to reduce visual impacts of structures within sensitive areas. Timely reclamation of surface disturbances at the substations and any areas with vegetation disturbance beyond temporary crushing of sagebrush and shrubs would reduce short-term impacts related to color and line contrasts from exposed soils. Potential additional mitigation measures to reduce long-term visual impacts in the Project Area were analyzed in the Visual Impact Assessment, and include the following:

- Compensatory mitigation of visual impacts to the New Fork Campground and New Fork River NSO area.
  - Upgrades that would improve visitor experience at the campground would compensate for the loss of recreation values at this site but would not necessarily minimize visual impacts.
  - Potential impacts of implementing this measure would include increased traffic, noise, and possible impacts from erosion and runoff during construction.
  - BLM would conduct an environmental analysis prior to implementing this measure, in compliance with NEPA.
- Mitigation of visual impacts along U.S. 191 by removal of the existing 12-kV powerline located on the opposite side of the highway. The powerline could either be buried or constructed above ground next to the proposed transmission line, allowing unobstructed views of the Wind River Mountains to the east.
  - This measure would not affect the view of transmission poles and lines along the west side of U.S. 191, but it would provide an improved view in the opposite direction, thus reducing the overall effect to sensitive viewers using the highway.
  - Potential impacts of implementing this measure include surface-disturbing activities in sensitive biological habitats for federally listed species or BLM-listed sensitive species, potential for erosion, and loss of native vegetation.
  - BLM would conduct an environmental analysis prior to implementing this measure, in compliance with NEPA.

- Mitigation of visual impact of COR-TEN steel transmission structures by use of galvanized steel poles.
  - This measure would provide the viewer with low visual contrast against the blue or gray sky which would be more suited to the setting.
  - No potential impacts to resources would occur other than those already identified in this EA.
- Painting steel transmission structures a color that blends with the natural color of the landscape.
  - Using galvanized steel poles in place of wood would mitigate the visual impacts of dark-colored poles. Additionally, steel poles could be painted to blend with lighter colored landscapes in areas with a high contrast rating.
  - Painted poles would require re-painting approximately every three to five years, a process that would include driving specialized equipment along the ROW to sand blast, re-paint, then clean the insulators of each structure. Electrical power must be turned off for large sections for the duration of this process for worker safety. Such paint restoration activities would likely occur during summer months.
  - Potential impacts to the human and physical environment would occur as a result of implementing transmission structure painting as a mitigation measure, including, but not limited to, the following:
    - Socioeconomics – Industrial users in the Anticline Area would be without electrical power for a period of time during paint restoration. Such industries and commercial entities could rely on back-up gas-fired or diesel-burning generators. The City of Pinedale may experience brown-outs or other intermittency of electricity during paint restoration activities during their peak tourist season. The socioeconomic impact of intermittent loss of electricity in the future would require further analysis.
    - Air quality – Regional air quality emissions would likely increase during paint restoration due to the increased use of gas-fired or diesel-burning generators to provide or supplement lost electrical supply. Although such effects would be temporary and occur during summer months, they could increase haze and other adverse air quality effects. Additional analysis of air quality effects would be required.
    - Vegetation and wildlife – Although BLM acknowledges the likely long-term disturbance of a two-track road along the transmission line ROW for all alternatives, disturbance from a regular three- to five-year paint restoration cycle would increase the impacts of such long-term vegetation disturbance. Additional analysis of the potential effects to vegetation and wildlife would be required.

### 4.3.5 Cultural Resources

#### 4.3.5.1 Impact Criteria

The Pinedale RMP ROD has developed management objectives designed to protect significant historic, archaeological, and other culturally sensitive resources from damage or destruction and facilitate suitable scientific, educational, and recreational uses of cultural

resources (BLM 2008a). Of "particular concern," per the Pinedale RMP ROD, are the Lander Trail and other significant historic transportation sites and Native American traditional use areas and sacred places, with concerns extending to any historically intact visual setting of these significant historic trail and tribally sensitive resources that may be integral to site significance (BLM 2008a).

Alternative 1 and the action alternatives could affect sites that are eligible for the NRHP; whereas, the No Action Alternative would have no effect. An effect is defined as an alteration to the characteristics of an historic property qualifying it for inclusion in or eligibility for the NRHP (43 CFR 800.16[i]). These effects could be in the form of direct, indirect, or cumulative impacts. Direct impacts are physical and can cause adverse effects to the site or its setting. Direct impacts could occur from ground-disturbing activities such as:

- clearing (grading and leveling ground using heavy equipment) the surface to create staging areas for construction equipment, to level out pulling and tensioning pad sites, to place transmission line poles, and to construct the proposed substations;
- vehicle traffic through sites during transmission line construction and maintenance operations that might directly damage cultural resources or create two-track roads through or adjacent to the site, or result in surface soil displacement or soil compaction;
- auger holes and power pole placement in cultural resource sites during construction or maintenance; and
- dragging transmission lines through cultural resource sites during construction or maintenance. Visual, auditory, or olfactory change to the setting of the area, including the placement of power poles, transmission wires, and substation structures, new two-track trails, and any other disturbance, is also considered to have a direct effect on those sites for which setting is an integral component of site significance.

Indirect effects to sites could occur through such ground-disturbing activities as may increase soil erosion on adjacent cultural resource sites and creation of adjacent trails, which subsequently might be used for access by recreational visitors and which may increase erosion. Providing access into areas containing sites through the creation of additional two-track trails could lead to increased looting, vandalism, and damage to cultural resources.

Most prehistoric sites are considered to be significant under NRHP Criterion D, because they may yield information important in prehistory or history (36 CFR 60.4[d]). These types of sites are most sensitive to direct impacts, which may affect their ability to provide information.

Cultural resource sites may also be eligible for NRHP listing under Criteria A, B, or C (36 CFR 60.4) because they are associated variously with important events, people, styles, characteristics, and periods in American history. If one of these three criteria apply, then there are seven aspects of integrity which must be must considered in order to support the eligibility determination: setting, location, design, material, workmanship, association, and feeling. To properly evaluate the cultural resource, one must take into account these aspects of integrity and consider all potential effects, such as visual, auditory, or olfactory intrusions, which may

directly or indirectly cause alterations in the character or use of significant cultural resources. Because there is potential to affect the various aspects of integrity of cultural resources that may be NRHP-Eligible under Criteria A, B, or C, it is appropriate to define separate and different APEs for each type of potential impact. For example, the APE for the setting of such historic properties is larger than the APE for direct physical impacts and must be evaluated, both inside and outside of the direct path of project construction. Visual intrusions by features out of character with the historic landscape can diminish or destroy the essential setting of such sites, alter their integrity, and extinguish their eligibility for inclusion in the NRHP. In 2006, the BLM established a protocol with Wyoming SHPO for assessment of potential impacts to the historic setting of historic properties and guidance for adequate mitigation of visual impacts (BLM and Wyoming SHPO 2006).

Sites that are considered to be culturally sensitive or sacred to Native American groups are further specifically protected under EO 13007 addressing Indian Sacred Sites, in addition to their protection under the NHPA and other federal legislation, and may include but are not limited to rock shelters, rock art, rock alignments, Native American burials, and other traditional cultural properties (TCPs) as described in the PFO RMP ROD (BLM 2008a). Unlike most prehistoric sites, significant historic sites and sites sensitive to Native American tribes may be affected indirectly as well as directly by project development. Because the setting of significant historic properties and traditional Native American cultural properties can be integral to resource values, visual, auditory, and olfactory intrusions may adversely affect such cultural resources and are considered direct impacts. These types of sites may require additional consultation between the BLM and the appropriate tribal government(s).

#### 4.3.5.2 No Action Alternative

Under the No Action Alternative, no additional impacts to cultural resources would occur other than those previously approved for other non-related actions in the area.

#### 4.3.5.3 Alternative 1

Under Alternative 1, all impacts and adverse effects to historic, archaeological, and culturally sensitive resources, and the integral settings of these resources, could be avoided or mitigated through the approaches described in Subsection 4.3.5.5, Mitigation Opportunities, below. Avoidance is the preferred first consideration for cultural resources in the PFO RMP ROD. Avoidance allows for greater sustainability of non-renewable cultural resources. Other forms of mitigation, such as data recovery at archaeological sites or off-site mitigation at historic trails and roads, may be acceptable in some circumstances if avoidance is not possible.

Environmental consequences for Alternative 1 and all action alternatives would be similar to each other in that all would have the potential for impacts to cultural resources, as shown in Table 4-16. However, each action alternative would be of greater potential impact to cultural resources than the No Action Alternative. In every action alternative, all OHV traffic would be confined to a corridor, 150 feet wide (75 feet on either side of the centerline) or narrower, that has been inventoried for cultural resources and approved by the BLM prior to the start of the Project. Flexibility exists for adjustment of pole placement along the project corridor.

Alternative 1 consists of Segments 1 through 7 and the Jonah and Paradise substations. The total number of NRHP-Eligible cultural resource sites threatened by this alternative is 19

versus 16 should Segment 6A or Segment 6B along U.S. 191 be selected (see Table 4-17). However, these site totals require further explanation, since several of Alternative 2 (i.e., Segments 1A and 2A) better minimize impacts to significant site settings than may others and since the three additional NRHP-Eligible archaeological sites along Alternative 1, Segment 6 might be as easily avoided as the lesser quantity found on Alternative 6A—resulting equally in no effect to cultural resources.

In the absence of mitigation, direct adverse impacts would be anticipated to NRHP-Eligible cultural resources from implementation of Alternative 1. If not mitigated, these impacts are anticipated to be greater under Alternative 1 than under all other alternatives, except for exclusive use of Segment 4A and Segment 4B, which are expected to have equal impact potential. Regardless, without mitigation some level of adverse impact to significant cultural resources would be anticipated for all segments and all Alternative 2 and Alternative 3, except the Paradise Substation and its alternatives, which have no cultural resources identified within their APE.

Along the corridor of Alternative 1, the westerly end of Segment 1 crosses and parallels portions of the historic Opal Wagon Road route for an effective distance of approximately 2.25 miles. Although this portion of the Opal Wagon Road has previously been recommended as not contributing to the NRHP eligibility of the overall historic site, no SHPO review of and concurrence with this recommendation is recorded; therefore, this recommendation may be subject to revision. The portion of Segment 1 potentially impacting the Opal Wagon Road is common to all action alternatives.

At least the east 2 miles of Segment 1 are within the visual setting of the Wardell Bison Trap site, a communal big game kill site and its associated features, sensitive to Native American tribes that traditionally inhabited the area. Although Segment 1 proposes to follow an existing 69-kV line through this area, the larger 230-kV towers and greater number of lines promise to have a more dominant and therefore more highly visible presence on the landscape. In comparison, Segment 1A better parallels the SH 351 corridor 0.5 mile farther north of the cultural resource site, and better uses the rise of the ridge that supports the highway as a backdrop to minimize intrusions on the landscape. Segment 1B follows the north side of the existing 69-kV line thereby using the existing visual disturbance corridor to buffer the presence of the larger 230-kV line. Furthermore, Segment 1B although closer to the Wardell Bison Trap site than Segment 1A, uses the higher elevation rise of the SH 351 ridge that supports the highway as a backdrop in a similar manner to Segment 1A, but further minimizes intrusions on the landscape through its less elevated location.

**Table 4-17. Comparison of Action Alternative Effects on NRHP-Eligible Cultural Resource Sites.**

| Project Segments | Alternative 1 NRHP-Eligible Sites within APE (Site No.) | Alternative 2 NRHP-Eligible Sites within APE (Site No.) | Alternative 3 NRHP-Eligible Sites within APE (Site No.) |
|---|---|---|---|
| 1 | 48SU301/302 (Wardell Bison Trap), 48SU852 (Opal Wagon Road) (total = 2 sites) | 48SU301/302, 48SU852 (Opal Wagon Road) (total = 2 sites) | 48SU301/302, 48SU852 (Opal Wagon Road) (total = 2 sites) |
| 2 | 48SU387 (Lander Trail or Road) (total = 1 site) | 48SU387 (total = 1 site) | 48SU387 (total = 1 site) |
| Paradise Substation and 25-kV line | | | |
| 3 | 48SU387 (total = 1 site) | 48SU387 (total = 1 site) | 48SU387 (total = 1 site) |
| 4 | 48SU387 (total = 1 site) | 48SU387 (total = 1 site) | 48SU387 (total = 1 site) |
| 5 | 48SU3210, 48SU3221, 48SU4707, 48SU6628, 48SU6631, 48SU6633 (total = 6 sites) | 48SU3210, 48SU3221, 48SU4707, 48SU6628, 48SU6631, 48SU6633 (total = 6 sites) | 48SU3210, 48SU3221, 48SU4707, 48SU6628, 48SU6631, 48SU6633 (total = 6 sites) |
| 6 | 48SU2371, 48SU2436, 48SU3933, 48SU6589, 48SU6524, 48SU6626 (total = 6 sites) | 48SU1408 (New Fork Wagon Road), 48SU2910, 48SU3490 (total = 3 sites) | 48SU1408 (New Fork Wagon Road), 48SU2910, 48SU3490 (total = 3 sites) |
| 7 | 48SU2258, 48SU6623 (total = 2 sites) | 48SU2258, 48SU6623 (total = 2 sites) | 48SU2258, 48SU6623 (total = 2 sites) |
| Jonah Substation | 48SU5861, 48SU5862 (total = 2 sites) | 48SU5861, 48SU5862 (total = 2 sites) | 48SU5861, 48SU5862 (total = 2 sites) |
| **Total Site Count** | **19*** | **16*** | **16*** |

*Less repeated occurrence of the 48SU387 (the Lander Trail or Road) in the column.

Also, along the corridor of Alternative 1, the majority (all except the northeast 3 miles) of Segment 2 is within the Class II viewshed that extends within 3 miles of portions of the Lander Trail where the visual setting contributes to the NRHP-eligibility of the overall site. For just over 8 miles, Segment 2 basically descends into the trail setting from the northeast to eventually cross the historic trail corridor perpendicularly along the Green River corridor. In comparison, Segment 2A endeavors to stay beyond 3 miles from the Lander Trail, west from the proposed Paradise Substation to the Green River corridor. Only once reaching the Green River corridor does Segment 2A turn directly south to join Segment 2 in crossing the historic trail perpendicularly, entering into the visual setting of the resource for a length of 3 miles in joining Segment 2. In paralleling the Green River corridor, both Segments 2 and 2A join and parallel the route of an existing 69-kV line and an existing improved gravel road. This is at the edge of the VRM Class II classification, due to the presence of unclassified private lands in the river corridor. Moreover, the point of trail crossing was selected because it is not intact here; moreover, the trail traverses through the slopes breaking to the Green River at this point, tending to obscure the routes of the proposed Project segments from potentially more intact trail portions eastward. This Lander Trail crossing is common to all action alternatives. The PFO RMP ROD allows for linear crossings within 0.25 mile of the Lander Trail as a general exception to the NSO or disturbance policy to this resource (BLM 2008a).

Segment 3 along Alternative 1 similarly proposes to cross the Lander Trail at a point of existing disturbance along a private property fence line (and ditch crossing) at the edge of the VRM Class II area paralleling the New Fork River. All but approximately the north 1.5 miles of Segment 3 are within 3 miles of the Lander Trail.

Segment 4, Segment 4A, and Segment 4B propose to cross 0.25 mile of BLM land adjacent to the New Fork River, within 3 miles of the Lander Trail within the area of VRM Class II protection established for that historic trail setting.

NRHP-Eligible archaeological sites along Alternative 1 Segments 5, 6, and 7 (as listed in Table 4-17 above) would be threatened by impacts from the direct physical ground-disturbing actions described under the impact criteria in Section 4.3.5.1, and the means of avoiding or mitigating these impacts, as described in Section 4.3.5.5, would equalize—reducing or eliminating the adverse effect—to these significant cultural resources under all action alternatives.

Although not in the direct APE of Segment 6, two stone circle sites (48SU3801 and 48SU5518), one previously unevaluated and the another recommended Not Eligible for NRHP nomination, are located within 1 mile of the segment and are of the type that could require further Native American consultation as to the sites' cultural sensitivity to tribes as the site features are sufficiently intact. Potential impacts to the visual setting of these sites are specific to Alternative 1 as Segment 6A and Segment 6B avoid these sites by more than 1 mile.

Additionally, Segment 7 presents a stone circle site (48SU6247) that, although previously recommended as Not Eligible for NRHP nomination, is of a type that could require further Native American consultation as to the site's cultural sensitivity to tribes should the site

features be sufficiently intact. This segment is common to all action alternatives and is on BLM RSFO lands.

In the APE of the proposed Jonah Substation location, at the end of Segment 7 and common to all action alternatives are two archaeological sites Eligible for NRHP nomination. A 40-acre block area was surveyed for cultural resources for this substation location. If the 15-acre substation parcel and its access drive were placed on these sites, adverse effects to archaeological deposits would result.

Along Alternative 1, as well as common to all other action alternatives, potential discovery situations are known to arise in areas of suitable soil deposition, such as those with sufficient eolian (e.g., sand dune) deposits, or where San Arcacio soils occur in the Jonah or adjacent Anticline South cultural subregions. Potential discovery situations may also be near the Paradise Substation and its alternative where prehistoric pit house remains have been previously exposed during construction; or adjacent to known archaeological site exposures as at the Jonah Substation.

No cultural resources have been identified along the 25-kV transmission line APE from the Paradise Substation B location south-southeast to Paradise Road. A discovery and mitigation plan should be developed to avert impacts should archaeological materials or buried remains be unexpectedly discovered as a result of exposure during ground disturbance from project development. Prehistoric pit house remains have previously been exposed during construction in the general vicinity of the Substation B location and the location(s) of the Paradise Substation of Alternative 1 or Alternative 2. The 25-kV line segment is common to all action alternatives.

#### 4.3.5.4 Alternative 2

Under Alternative 2, all impacts and adverse effects to historic, archaeological, and culturally sensitive resources, and the integral settings of these resources, could be avoided or mitigated through the approaches described in Subsection 4.3.5.5, Mitigation Opportunities, below.

Segments 1A and 2A would more effectively (but not entirely) avoid impacts to the Wardell Bison Trap site (at Segment 1) and the Lander Trail (at Segment 2A) than the respective Segments 1 and 2 of Alternative 1. The potential for impacts to all other NRHP-Eligible resources in the Project APE (see Table 4-17 above) is relatively equal between all action alternatives.

*Segment 1A*

Potential impacts to cultural resources under Segment 1A would be the same as under Alternative 1, except Segment 1A would more favorably reduce the potential scale of visual impact to the Wardell Bison Trap site.

Segment 1A would place project development up to 0.5 mile farther from the Wardell Bison Trap and more closely co-locate the proposed transmission line with the SH 351 corridor. Although this alternate would also place the proposed transmission line 0.5 mile closer to the Lander Trail, the intervening ridge that supports SH 351 is anticipated to off-set this factor, unless the height of the towers for the 230-kV line exceed the potential for this off-set.

*Segment 2A*
Potential impacts to cultural resources under Segment 2A would be the same as under Alternative 1, except Segment 2A would more favorably reduce the potential scale of visual impact to the Lander Trail site.

Segment 2A would eliminate approximately 5 miles more project segment length from within 3 miles of the Lander Trail than would Alternative 1. Furthermore, this eliminated length would occur over the rise of The Mesa area, where project visibility might be most prominent from the historic trail route, especially where proposed project routes nearly parallel the trail. Segment 2A would approach within 3 miles of the Lander Trail, within its visual setting, only perpendicularly at a point of less visual prominence at the base of slopes breaking to the Green River from The Mesa tops.

*Substation A*
Potential impacts to cultural resources under Substation A would be the same as under Alternative 1 for the Paradise Substation. No cultural resources are identified at either location. A discovery and mitigation plan should be developed to avert impacts should archaeological materials or buried remains be unexpectedly discovered as a result of exposure during ground disturbance from project development. Prehistoric pit house remains have previously been exposed during construction in the general vicinity of Substation A location and the location of the Paradise Substation of Alternative 1.

*Segment 4A*
Potential impacts to cultural resources under Segment 4A would be the same as under Alternative 1.

*Segment 6A*
Although Segment 6A has four fewer significant archaeological sites than does Segment 6 of Alternative 1, once avoidances are established it is anticipated that no adverse affects for the six NRHP-Eligible archaeological sites along Segment 6 would be equally attainable as those two NRHP-Eligible archaeological sites along Segment 6A.

Segment 6A has an additional potential constraint that Alternative 1 lacks. Segment 6A intersects the historic New Fork Wagon Road corridor, which could potentially add visual setting concerns that do not comparably exist on Segment 6 of Alternative 1. However, this potential concern is not expected to be realized due to the existing segmentation and lack of intactness of the historic wagon road along U.S. 191, which Segment 6A parallels.

#### 4.3.5.5 Alternative 3

Under Alternative 3, all impacts and adverse effects to historic, archaeological, and culturally sensitive resources, and the integral settings of these resources, could be avoided or mitigated through the approaches described in Subsection 4.3.5.5, Mitigation Opportunities, below. Avoidance is the preferred first consideration for cultural resources in the PFO RMP ROD. Avoidance allows for greater sustainability of non-renewable cultural resources, whereas many forms of mitigation (e.g., data recovery at archaeological sites or off-site mitigation at historic trails and roads) may be more compensatory of resource loss.

Alternative 3 Segment 1B would more effectively (but not entirely) avoid impacts to the Wardell Bison Trap site (at Segment 1) than the respective Alternative 1 Segment 1. The potential for impacts to all other NRHP-Eligible resources in the Project APE (see Table 4-17 above) is relatively equal between all action alternatives.

*Segment 1B*
Potential impacts to cultural resources under Segment 1B would be the same as under Alternative 1, except Segment 1B would more favorably reduce the potential scale of visual impact to the Wardell Bison Trap site.

Segment 1B would place project development farther from the Wardell Bison Trap and closely co-locate the proposed transmission line with the northern side of the existing 69-kV line, which is anticipated to off-set the visual disturbance of the larger 230-kV line to the site. This alternate would also place the proposed transmission line farther from the Lander Trail and outside of the VRM Class II viewshed of the Lander Trail.

*Segment 4B*
Potential impacts to cultural resources under Segment 4B would be the same as under Alternative 1.

*Segment 6B*
Potential impacts to cultural resources under Segment 6B would be the same as under Alternative 1.

*Substation B*
Potential impacts to cultural resources under Substation B would be the same as under Alternative 1 or Alternative A for the Paradise Substation A. No cultural resources are identified at either location. A discovery and mitigation plan should be developed to avert impacts should archaeological materials or buried remains be unexpectedly discovered as a result of exposure during ground disturbance from project development. Prehistoric pit house remains have previously been exposed during construction in the general vicinity of Substation B location and the location(s) of the Paradise Substation of Alternative 1 or Alternative 2.

#### 4.3.5.6 Cumulative Impacts

Multiple oil and gas drilling and production projects contribute to the cumulative impacts to cultural resources in the Project Area. Although the PFO RMP ROD upholds a policy favoring avoidance of impacts and therefore preservation of cultural resources, as development becomes denser, cultural resources (and the integral visual setting of some) become increasingly more difficult to avoid and more intrusive mitigation measures are necessary to avoid the destruction of non-renewable material culture. Potential for disturbance of cultural materials and site settings is proportionate to the surface area of ground disturbance and the scale of above-ground development on the cultural landscape. Increased ground disturbance also increases the potential for unanticipated discoveries, and the potential for the unmitigated loss of cultural resource values and information if those discoveries go unrecognized or if there is loss due to damage as a result of the disturbance during discovery.

#### 4.3.5.7 Mitigation Opportunities

Cultural resources determined to be eligible for NRHP nomination, and thereby determined significant, will be protected; "Potential effects on cultural resources will be managed, to the extent possible, through avoidance and confidentiality of location… Where avoidance is not feasible or prudent, mitigation through data recovery, monitoring, or other data collection will be required" (BLM 2008a:[2]11). Additionally where sites of concern to Native American tribes are identified, appropriate tribes will be consulted and "The input received from affected tribal groups will be considered before any irretrievable or irrevocable decisions are made" (BLM 2008a:[2]11); moreover, these sites are stipulated for NSO (BLM 2008a).

Archaeological sites eligible for NRHP nomination under Criterion D (36 CFR 60.4[d]) tend to be most sensitive to direct impacts, which may affect their ability to provide information. If such an archaeological site cannot be avoided, additional mitigation such as data recovery may be required. Data recovery is generally defined as excavation, analysis, and dissemination of all significant archaeological data as determined by a federal archeologist.

For this Project, archaeological sites that are determined to be eligible for nomination to the NRHP, and that fall within the APE for physical impacts, may be avoided by 1) rerouting the construction traffic around site boundaries, and 2) shifting the tower locations away from site areas to ensure that no adverse effects occur to historic properties as a result of transmission line construction activities. This avoidance may be further supported by barrier fencing and archaeological monitoring or inspection during construction. These stipulations will be determined as necessary by the BLM archaeologist. Residual impacts may be avoided post-construction, as during maintenance episodes, by mitigation of threatened sites, continuous and regular site monitoring and assessment, communication with the BLM regarding proposed maintenance episodes, prohibition of off-road ROW work in wet-ground conditions, reclamation/replanting of vegetation in disturbed areas, and placement of permanent barriers along the project line at intersections with existing roads, such that trails would not become established.

If a large eligible archaeological site straddles the corridor so that avoidance is impossible, evaluative testing may be required to assess the effects of the Project on those portions of the site which contribute to the overall NRHP eligibility determination. If contributing and non-contributing portions of the site are identified, it is feasible that construction may be permitted on non-contributing portions, while contributing portions may require mitigation. If significant sites or significant site portions cannot be avoided by construction activities, mitigation measures such as intensive data recovery may be required.

Mitigation measures recommended below would further reduce adverse impacts to below the level of significance either through further resource treatment (if necessary), avoidance, or mitigation.

- A discovery and mitigation plan should be developed to avert impacts should archaeological materials or buried remains be unexpectedly discovered as a result of exposure during ground disturbance from project development, and to uphold avoidance and mitigation for the significant sites that have been already identified. The plan may include requirements for an archaeological monitor in sensitive areas

where ground disturbance may take place adjacent to known cultural resource sites or in areas with potential for archaeologically sensitive soil deposition.

- If the Opal Wagon Road should require mitigation along Segment 1, rerouting the effective portions of Segment 1 (potentially to existing disturbance directly beside and paralleling U.S. 189) to avoid adverse effects to the Opal Wagon Road would be recommended or, if this proves not feasible, off-site mitigation approaches should be sought.
- If the height of the proposed transmission line towers along Segments 1, 1A, or 1B prove taller than ridge and existing highway intrusions to a degree where adverse effect is still reached in relation to the integral setting of the Lander Trail, mitigation would be required. In either case, a visual contrast rating assessment would be necessary for the Project in relation to the historic trail at this location, and an acceptable treatment plan established per the BLM/Wyoming SHPO Protocol Agreement (BLM and Wyoming SHPO 2006) and the PFO RMP ROD (BLM 2008a). Because it may not be feasible to further reroute Segments 1, 1A, or 1B without affecting the Wardell Bison Trap site, potential off-site mitigation might then become necessary to off-set impacts.
- In relation to the Wardell Bison Trap site at Segments 1, 1A, and 1B, a visual contrast rating assessment would need to be completed, and an acceptable treatment plan established per the BLM/Wyoming SHPO Protocol Agreement (BLM and Wyoming SHPO 2006) and the PFO RMP ROD (BLM 2008a). Additional Native American consultation may be necessary in relation to the proposed Project along either Segment 1 or 1A, to receive and consider input from affected tribes before irretrievable or irrevocable decisions are made.
- In relation to the Lander Trail at Segments 2 and 2A, a visual contrast rating assessment would need to be completed, and an acceptable treatment plan established per the BLM/Wyoming SHPO Protocol Agreement and the PFO RMP ROD. Because it is not feasible to reroute project alternatives between the Big Piney Substation and the proposed Paradise Substation location (or its alternative) without crossing the Lander Trail corridor, even if a non-intact length of the historic trail is selected for spanning, potential off-site mitigation might then become necessary.
- In relation to the Lander Trail at Segment 3, a visual contrast rating assessment would need to be completed for the Project in relation to the historic trail at this location, and an acceptable treatment plan established per the BLM/Wyoming SHPO Protocol Agreement and the PFO RMP ROD. Because it is not feasible to reroute project alternatives between the proposed Paradise Substation location (or its alternative) and the Jonah Substation without crossing the Lander Trail corridor, even if a non-intact length of the historic trail is selected for spanning, potential off-site mitigation might then become necessary. The same is true for Alternative 1 Segment 4, Segment 4A, and Segment 4B where they cross 0.25 mile of BLM land adjacent to the New Fork River, within 3 miles of the Lander Trail.
- No surface disturbance would be permitted in the paths of intact historic trail and wagon road segments that contribute to the NRHP-eligibility of an historic transportation site. No project traffic would cross intact portions of significant historic

trail or road sites. Project traffic would be limited to areas of existing disturbance in crossing these historic transportation routes.

- The 15-acre parcel and access driveway for the Jonah Substation should be positioned within the 40-acre APE review area outside the boundaries of sites 48SU5861 and 48SU5862.
- Once input is received from affected tribes on stone circle sites 48SU3801, 48SU5518, and 48SU6247, and before irretrievable or irrevocable decisions are made, a treatment plan may need to be assembled if the site(s) are determined to be significant. This treatment plan should consider further reroute options for additional site avoidance by the transmission line, maximum distance/least visibility placement of structures in relation to the site(s), and no surface disturbance of the site(s).
- Once final ROW access is received, a field survey would be recommended of all remaining private and federal lands of Segments 1A, 1B, 2A, 4A, 4B, 6B, and the 25-kV transmission line, of pulling and tensioning stations that may extend beyond the project corridors surveyed for cultural resources, and of reroutes outside of that corridor intended to enhance avoidance of cultural or other resources or environmental constraints and hazards.
- No structures or disturbance would be permitted on portions of NRHP-Eligible archaeological sites that contribute to site significance; transmission lines would span or bypass such sites, and project traffic and blading would be routed or placed away from or around them. Any portion of an NRHP-Eligible site not contributing to site significance and proposed for structure placement or disturbance would require the appropriate level of testing, review, and agency concurrence within a mitigation plan prior to project actions being decided or approved at the site.
- Where establishment of avoidance reroutes proves untenable or unreasonable, additional subsurface testing of archaeological sites for potential for project impacts would be recommended.

### 4.3.6 Environmental Justice

Minority populations in the study area make up a very small portion of residents in Sublette County (see Table 3-26). It is assumed that minority populations in the area would have the same opportunities in obtaining new jobs available from all action alternatives, therefore resulting in no disproportionate impacts.

As noted previously, Sublette County has what is considered a medium-low poverty rate compared to the rest of the nation, with 9.7% of people in the county living below the poverty level. If housing prices and the cost of living continue to increase, low-income families could be affected by the action alternatives. However, impacts are not expected to increase substantially over the current conditions; housing prices and the cost of living are expected to increase at a rate similar to historic trends. Therefore, no minority or economically disadvantaged communities or populations are expected to be disproportionately affected by any of the action alternatives.

### 4.3.7 Fire Management

#### 4.3.7.1 Impact Criteria

Any potential for the increased in human-caused ignition of fires would be considered an adverse impact to fire management. Direct impacts would result from equipment ignition sources and direct human ignition (i.e., cigarettes). Indirect impacts could result from alteration or increase in flammable fuel loads.

#### 4.3.7.2 No Action Alternative

Under the No Action Alternative, no additional impacts to fire management other than those previously approved for the Project Area would occur.

#### 4.3.7.3 Alternative 1

Potential wildfire hazards from the proposed Project would be low to moderate throughout most of the year, but would have the potential to be high or extreme during the fire season. Fire danger is likely to be highest during the summer months, but would also depend on vegetation and climatic conditions.

There are very few communities at risk within the Project Area with the exception of Big Piney and Marbleton along the western edge of Section 1 and along the Green River, adjacent to the north/south-running portion of Segment 2. The majority of the land within the proposed Project Area is public with only a few areas of private landownership adjacent to the Project corridor. Access for fire management is good throughout the FMU by the use of highways, resource roads, and industrial roads in the Jonah Gas Field.

Direct impacts that could result from Alternative 1 would primarily include the ignition of a fire from construction activities or the proposed transmission line itself. The increase in human activity during construction of the proposed Project could increase the potential for human-related ignition of wildfires. Vegetation along the transmission line ROW would not be removed and would provide fuel in the event of an ignition resulting from the proposed Project. If a transmission line goes down or in the event of arcing along the power line, sparks could be generated and result in the ignition of a wildfire.

Indirect impacts of Alternative 1 could provide an opportunity for noxious weeds and cheatgrass to invade the Project Area, while the crushing of vegetation could result in an increase in dead fuel loading making the existing fuel condition more flammable than the previous fuel condition. An increase in invasive species could result in a shift from the natural fire regime to a regime with an unnatural, more frequent fire return interval. Furthermore, in the event of a wildfire within proximity to the transmission line, firefighter safety could be impacted by flashovers generated by the combination of dense smoke and hot gases that can create a conductive path away from the powerlines.

If the appropriate fire prevention and mitigation tactics are employed, direct and indirect impacts to fire management would only be minor as a result of Alternative 1 because the ignition of new fires during construction activities would be kept to a minimum.

#### 4.3.7.4 Segment and Substation Alternatives

Impacts resulting from each of the alternatives (Segments 1 through 7, 1A, 2A, 4A, and 6A) and substations (Paradise Substation and Substation A and Jonah Substation) would not be different than those that may result from Alternative 1 providing the appropriate fire prevention and mitigation tactics are employed.

#### 4.3.7.5 Cumulative Impacts

Cumulative impacts to fire management are not anticipated with the appropriate fire prevention and mitigation procedures in place and thus would not be affected as a result of Alternative 1. Fire management practices, including fire suppression, would be consistent with current management actions.

#### 4.3.7.6 Mitigation Opportunities

All federal, state, and county laws, ordinances, rules, and regulations that pertain to prevention, pre-suppression, and suppression of fires shall be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations and would be required to take note of the local fire danger levels and any specific fire restrictions in place at the time that work activities take place. It shall be the responsibility of the construction contractor to notify the BLM when a project-related fire occurs within or adjacent to the construction area.

The contractor shall be responsible for any fire started, in or out of the Project Area, by its employees or operations during construction. The contractor would be responsible for fire suppression and rehabilitation. The contractor would take aggressive action to prevent and suppress fires on and adjacent to the Project Area, and would use its workers and equipment on the Project for fighting fires within the Project Area.

Specific construction-related activities and safety measures, as listed below, would be implemented during construction of the transmission line in order to prevent fires and to ensure quick response and suppression in the event a fire occurs.

- All vehicles would stay on designated roads or park in areas free of vegetation, to the extent practicable.
- Vehicles, gas-powered equipment, and flues shall be equipped with spark arrestors approved by the AO.
- The contractor would provide and store in a place easily accessed at each construction site five shovels, two backpack pumps with water, and one 5-pound ABC dry powder CO fire extinguisher during all construction activities.
- All vehicles would be equipped with at least one fire extinguisher.
- The contractor would have the appropriate fire notification numbers for BLM fire dispatch, the AO, and the Construction Manager readily available for all employees in case of a fire.

### 4.3.8 Transportation

#### 4.3.8.1 Impact Criteria

Direct and indirect impacts could result during construction and maintenance activities. Direct impacts would primarily result from increases in local traffic volumes on highways and resource roads during construction and operation and maintenance activities. These increases would be caused by movement of project-related workers, equipment, and materials to and from the Project Area for construction and maintenance. Indirect impacts include increased congestion, degradation of local road conditions, and an increase in accident rates and wildlife/vehicle collisions due to increased volumes of traffic. If construction and maintenance take place during or following wet weather conditions that saturate the soil, ruts would be created along dirt-surfaced roadways and would be another indirect impact that would result from the Project.

#### 4.3.8.2 No Action Alternative

Under the No Action Alternative, no additional impacts to transportation other than those previously approved for the Project Area would occur.

#### 4.3.8.3 Alternative 1

The study area for impacts to transportation includes all highways and roads that provide access to and traverse the Project Area. No additional roads would need to be constructed for Alternative 1. Small increases in local traffic would be expected throughout the duration of transmission line construction for the proposed and alternative routes. Workers residing locally, including those residing in the area temporarily, would travel to the construction sites by private vehicles. Workers could travel up to 30 miles along SH 351, U.S. 189, and U.S. 191 depending on where they are lodging during the course of construction of Alternative 1. For Alternative 1, construction traffic would vary across the duration of the transmission line, Paradise and Jonah Substations, and substation construction depending on the construction phase and would be localized. Traffic would increase for a short duration primarily on any highways and local access roads providing passage to the ROW within the areas being constructed. Given current levels of service on SH 351 and U.S. 191 and the relatively low and temporary traffic volumes associated with Alternative 1, impacts to transportation within the vicinity of the Project Area would be low and short-term.

Transmission line construction would require the movement of large vehicles along the ROW and from U.S. 189, U.S. 191, and SH 351 to the ROW. Existing local roads that access oil and natural gas facilities would be frequently used as well. For the most part, vehicles would use existing access roads to gain access to and within the ROW. In some instances, the contractor may need to travel overland to reach a pole location or pulling and tensioning sites that are not accessible by existing roads; however, this would be done within the designated ROW.

Transportation impacts would vary depending on the different phases of construction of the transmission line and the characteristics of the terrain. Vehicles used for construction of the proposed transmission line would range from two pickup trucks during the initial survey to stake out poles to up to eight pieces of heavy equipment (Table 4-18).

**Table 4-18. Transmission Line Construction Equipment and Personnel.**

| Activity | Personnel | Type of Equipment | Quantity |
|---|---|---|---|
| Survey | 3 | Pickup truck | 2 |
| Transporting equipment to pole locations along the ROW and assembling hardware on poles | 6 | Tracked backhoe or blade | 1 |
| | | Semi truck with flatbed trailer | 1 |
| | | Pickup truck | 1 |
| | | Water truck (for dust control near highways) | 1 |
| | | Crane | 1 |
| Setting poles | 6 | Pickup truck | 2 |
| | | Crane | 1 |
| | | Truck-mounted auger | 1 |
| Installing conductors, pulling and tensioning | 10 | Wire reel trailers | 2 |
| | | Diesel tractors | 2 |
| | | Helicopter or crane | 1 |
| | | Pickup truck | 2 |
| | | Drum puller | 1 |
| | | Double-wheeled tensioner | 1 |
| | | Carry all | 1 |
| | | Static trailer | 1 |
| Sagging, clipping, and dead-ending | 6 | High ranger | 1 |
| | | Pickup truck | 2 |
| Reclamation | 4 | Landscaped tractor with harrower and drill seeder | 1 |
| | | ATV with broadcast seeder | 1 |
| | | Pickup truck | 1 |

Transportation impacts would also vary depending on the different phases of construction of the Paradise and Jonah substations and would be localized within the vicinity of these stations at that time. Vehicles used for construction of the proposed substations would range from four pickup trucks during the initial site preparation to up to ten pieces of heavy equipment and pickup trucks (Table 4-19).

Direct and indirect impacts could result during construction and maintenance of Alternative 1. Direct impacts would primarily be increases in local traffic volumes on highways and resource roads. Construction of Alternative 1 would increase the volume of traffic on highways that provide access to the Project Area as well as on county and operator-maintained roads. These increases would be caused by movement of project-related workers, equipment, and materials to and from the Project Area for construction and maintenance. Indirect impacts would include increased congestion, degradation of local road conditions, and an increase in accident rates and wildlife/vehicle collisions due to increased volumes of traffic. If construction and maintenance take place during or following wet weather conditions that saturate the soil, ruts would be created along dirt-surfaced roadways and would be another indirect impact that would result from Alternative 1.

**Table 4-19. Substation Construction Equipment and Personnel.**

| Activity | Personnel | Type of Equipment | Quantity |
|---|---|---|---|
| Site preparation | 4 | Pickup truck | 1 |
| | | Tracked backhoe | 1 |
| | | Motor grader | 1 |
| Construction of the yard | 4 (Jonah), 7 (Paradise) | Tracked backhoe | 1 |
| | | Motor grader | 1 |
| | | Dump truck | 1 |
| | | Pickup truck | 1 |
| Installation of equipment | 8 (Jonah), 10 (Paradise) | Pickup truck | 2 (Jonah)<br>4 (Paradise) |
| | | Cement truck | 1 |
| | | Crane | 1 |
| | | Semi truck with flatbed | 1 |
| | | Material truck | 1 |
| Tie-ins to overhead lines | 4 | Bucket truck | 2 |
| | | Pickup truck | 2 |
| Energizing the switch yard equipment/substation equipment | 4 | Testing van and equipment | 1 |
| | | Mineral oil trailer | 1 |
| Site restoration and stabilization | 3 | Tractor | 1 |
| | | Broadcast seeder | 1 |
| | | Harrow | 1 |
| | | Pickup truck | 1 |

Highways that would be impacted during the construction of Alternative 1 include U.S. 189 and SH 351. These highways would experience increased traffic that would vary during the different phases of construction for the transmission line, and substations.

The average daily traffic associated with construction (2 to 10 workers, one round trip per day) would increase traffic by less than 1% compared with current traffic levels in the vicinity of the Project Area. During this phase, vehicle traffic would include heavy equipment and heavy- and light-duty trucks. Based on these assumptions and estimates, the incremental increase in area traffic associated with the proposed Project would not cause substantial deterioration of level of service for U.S. 189, U.S. 191, SH 351, or any county, BLM resource, local, and collector roads in the transportation study area for Alternative 1. Because the project traffic would cause a relatively small increase and would be of short duration, it would not likely cause a measurable increase in accident rates on federal and state highways.

After construction and reclamation are complete, equipment and vehicular traffic would significantly decrease and would only take place during regular inspections by ground and air and occasional maintenance activities on an “as needed” basis. Existing roads would be used unless it is not feasible. The relatively small, short-term increase in traffic would not likely cause substantial deterioration of the roads or increases in accidents. The contractor would be

responsible for constructing and maintaining new and improved roads in the Project Area; therefore, no fiscal effects related to roads would be anticipated.

#### 4.3.8.4 Segment and Substation Alternatives

Impacts to transportation under each of the alternatives would be the same as those discussed for Alternative 1.

#### 4.3.8.5 Cumulative Impacts

The cumulative impacts study area for transportation includes the highways and local/industrial roads adjacent to and within the proposed project corridor. Development of Alternative 1 in the area would only cause a minor increase in traffic and movement of heavy equipment in the county for a short duration compared with the existing traffic resulting from oil and gas development in the Jonah and Anticline Fields. Traffic associated with other activities, such as mining, livestock grazing, and recreation, is likely to remain similar to current conditions or increase minimally. The condition of these highways is adequate to accommodate existing levels as well as the small projected increases of traffic for the proposed Project. Alternative 1 would not contribute much increase in traffic relative to the existing traffic in the area and as a result would not contribute significantly to cumulative impacts within the area.

#### 4.3.8.6 Mitigation Opportunities

Resource sensitive areas along the overland travel routes used for construction and reclamation would be provided on maps and would be marked with flagging and fenced for avoidance. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line.

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