3.0 AFFECTED ENVIRONMENT

The proposed WMWE project area is located in southwestern Sweetwater County approximately 3.0 mi northwest of the town of Rock Springs, Wyoming (refer to Figure 1.1). The project area is located on the eastern edge of White Mountain, a prominent local mesa that rises approximately 1,000 ft above the elevation of Rock Springs. County Road 53 bisects the project area from north to south. Vegetation consists primarily of shortgrass and sagebrush-scrub habitat and is uniform throughout. The escarpment of the east side of White Mountain (outside the project area) is steep with eroded gullies and dense pockets of buckbrush and juniper.

This chapter describes the existing conditions of the physical, biological, cultural, and socioeconomic resources. The resources addressed in this chapter were identified during the internal and public scoping processes as having the potential to be affected by project-related activities.

3.1 AIR QUALITY AND CLIMATE

3.1.1 Air Quality

The impact assessment areas (IAA) for air quality is the project boundary plus a 31-mi buffer. A total of 62,726 acres (2.50%) of the 2,505,739-acre IAA has been disturbed, primarily by roads and cities.

The WDEQ/AQD has been authorized by the EPA to enforce national ambient air quality standards set forth in the *Clean Air Act*, as amended (42 U.S.C. §7401 et seq.) through Article 2 of the *Wyoming Environmental Quality Act* (Wyoming Statute [W.S.] 35-11-201 et seq.) and the Wyoming State Implementation Plan. The Wyoming and National Ambient Air Quality Standards (WAAQS and NAAQS) set upper limits for specific air pollutant concentrations at all locations where the public has access, expressed in micrograms per cubic meter ($\mu g/m^3$). Relevant WAAQS and NAAQS are presented in Table 3.1.

Relevant WAAQS and NAAQS are presented in Table 3.1. Wyoming Air Quality Standards and Regulations (WAQS&R) define ambient air as "that portion of the atmosphere, external to buildings, to which the general public has access" (WDEQ/AQD 2000a).

No site-specific air monitoring efforts have been conducted in the project area, and the proposed facility area is located in a rural setting with minimal industrial sources or vehicular traffic emission contributions to the airshed.

While there is no site-specific air quality monitoring within the project area, air quality monitoring has been conducted in Rock Springs (approximately 3.0 mi southeast of the project area). For 2008, the annual mean for $PM_{2.5}$ was 7.18 $\mu g/m^3$ and the annual mean for PM_{10} was 25$\mu g/m^3$.

3.1.2 Climate

The IAA is located in the ecoregion described as the Intermountain semi-desert province (U.S. Forest Service 2009). This province covers the plains and tablelands of the Columbia-Snake River Plateaus and Wyoming Basin. The higher overall elevation of the Wyoming Basin gives it slightly lower average temperatures and precipitation than on others portions of the province. Winters in southwest Wyoming are cold, and summers are short and cool. The climate of the Wyoming Basin is semiarid and cool. The annual mean temperature for Rock Springs is 42.6F (1971-2000) and the average annual precipitation in Rock Spring is 9.42 inches (1971-2000) (Curtis and Grimes 2004). Precipitation is fairly evenly distributed throughout the year, ranging from an average monthly low of 0.52 inches in February to an average monthly high of 1.36 inches in May (Curtis and Grimes 2004) with an average growing season of approximately 112 days (Curtis and Grimes 2004). Winds average approximately 12.1 mph and are primarily from the west-southwest (Martner 1986).

Table 3.1 Selected National, Colorado, and Wyoming Air Quality Standards (μg/m^3).

Pollutant/Averaging Time	NAAQS[1]	CAAQS[2]	WAAQS[3]	PSD Class I Increment[4]	PSD Class II Increment[4]
Carbon Monoxide (CO)					
1-hour[5]	40,000	40,000	40,000	--[6]	--[6]
8-hour[5]	10,000	10,000	10,000	--	--
Nitrogen Dioxide (NO_2)					
Annual[7]	100	100	100	2.5	25
Ozone					
1-hour[5]	--[8]	235	--[9]	--[6]	--[6]
8-hour[10]	157	157	157	--	--
Particulate Matter at Less than 10 Microns (PM_{10})					
24-hour[5]	150	150	150	8	30
Annual[7]	--[8]	50	50	4	17
Particulate Matter at Less than 2.5 Microns ($PM_{2.5}$)					
24-hour[11]	35	35	35	--[6]	--[6]
Annual[7]	15	15	15	--	--
Sulfur Dioxide (SO_2)					
3-hour[5]	1,300[12]	700	1,300	25	512
24-hour[5]	365	365	260	5	91
Annual[4]	80	60	60	2	20

1 NAAQS = National Ambient Air Quality Standards (adapted from 40 CFR 50.5-50.12). Primary standard unless otherwise noted. National Primary Standards establish the level of air quality necessary to protect public health from any known or anticipated effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

2 CAAQS = Colorado Ambient Air Quality Standards.

3 WAAQS = Wyoming Ambient Air Quality Standard.

4 The prevention of significant deterioration (PSD) demonstrations serve information purposes only and do not constitute a regulatory PSD increment consumption analysis.

5 No more than one exceedance per year.

6 No PSD increments have been established for this pollutant.

7 Annual arithmetic mean.

8 The NAAQS for this averaging time for this pollutant has been revoked by EPA.

9 There is no 1-hour WAAQS established for ozone.

10 Average of annual fourth-highest daily maximum 8-hour average.

11 An area is in compliance with the standard if the 98th percentile of 24-hour $PM_{2.5}$ concentrations in a year, averaged over 3 years, is less than or equal to the level of the standard.

12 Secondary standard. National Secondary Standards establish the level of air quality to protect the public welfare by preventing injury to agricultural crops and livestock deterioration of materials and property and adverse impacts to the environment.

3.1.3 Global Climate Change

Ongoing scientific research has identified the potential impacts of "greenhouse gas" (GHG) emissions (including carbon dioxide, CO_2; methane; nitrous oxide; water vapor; and several trace gasses) on global climate. Through complex interactions on a regional and global scale, these GHG emissions are thought to cause a net warming effect of the atmosphere (making surface temperatures suitable for life on earth), primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources are thought to have caused CO_2 concentrations to increase dramatically, and likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO_2 concentrations also lead to preferential fertilization and growth of specific plant species.

The assessment of GHG emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impact to global climate. However, the Intergovernmental Panel on Climate Change (2007) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations."

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. However, potential impacts to air quality due to climate change are likely to be varied. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. This could be due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Less snow at lower elevations could likely impact the timing and quantity of snowmelt, which, in turn, could impact aquatic species.

3.2 CULTURAL RESOURCES (INCLUDING NATIVE AMERICAN CONCERNS)

The IAA for cultural resources is the project boundary plus a 20-mi zone. A total of 38,289 acres (3.26%) of the 1,175,515-acre IAA has been disturbed, primarily by cities.

3.2.1 Cultural Resources

Cultural resources are the nonrenewable physical remains of past human activity and are protected under the Antiquities Act (1906), Section 106 of the *National Historic Preservation Act* (1966, as amended) (NHPA), the *Archaeological Resources Protection Act* (1979, as amended), the *Native American Graves Protection and Repatriation Act* (1990), and other statutes. The evaluation of a cultural resource's significance is based on criteria set forth in 36 CFR 60.4.

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
B) That are associated with the lives of persons significant in our past; or
C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D) That has yielded or may be likely to yield information important in prehistory or history.

A cultural resource may be eligible for inclusion in the NRHP if it meets one of the four criteria outlined above and retains sufficient integrity to convey its significance.

Archaeological investigations in the Green River Basin indicate that human activity has occurred across the landscape over the past 12,000 years, beginning during the Paleoindian period and continuing to the present. Throughout the prehistoric past, mobile hunters and gatherers traversed the area and exploited a wide variety of natural resources (Frison 1991). Historically, this portion of the Green River Basin was utilized as a corridor for early transportation routes, including emigrant trails, regional stage/freight roads, railroads, and communication networks. Historic settlement of the area occurred in association with these routes and was primarily fostered by natural resource extraction and ranching.

The area of potential effect (APE) for cultural resources consists of the block area encompassing the proposed project area to address direct effects plus a 20-mi zone around the project area to address visual effects.

3.2.1.1 Cultural Resources Within the APE for Direct Effects

A file search was conducted at the SHPO, Cultural Records Office, on February 9, 2009 (Wyoming SHPO 2009). The database review encompassed all the sections within the proposed project area, including Sections 6, 7, 18, and 19, T19N, R105W; Sections 1, 2, 11-13, 23-26, 35, and 36, T19N, R106W; Sections 19, 30, and 31, T20N, R105W; Sections 3, 11, 13, 14, 23-25, 35, and 36, T20N, R106W; and Section 31, T21N, R106W. According to the review, 21 projects have been completed within and adjacent to the current project area, and 19 sites have been discovered as a result.

Of the 21 projects, 12 were linear inventories for five seismic lines, five pipelines, one access road, and one powerline; five were block inventories completed for three miscellaneous projects, one range improvement project, and one well pad; and four were block/linear inventories conducted for two well/access road projects, one cell tower/ power line/access road project, and one miscellaneous project. Of the total 21 projects, only two were conducted prior to 1980 and do not reflect current standards for archaeological inventories.

In addition to the 21 projects identified during the review, a Class III inventory of approximately 2,650 acres of the total 13,165-acre WMWE project area was conducted in October and November 2008. The inventoried area consisted of 11 BLM-managed parcels (development ROW), representing approximately 20% of the total project area, and included some areas that were previously inventoried during the aforementioned projects. On March 10 and June 15, 2009, the BLM sent the reports (Fleming et al. 2009a and 2009b) to the SHPO for review and concurrence. A SHPO concurrence letter dated July 14, 2009, was received by the BLM, and the project was recently accessioned into the SHPO database.

Of the 19 sites, 15 were recorded during the 21 previous projects identified in the database, and four were recorded during the recent Class III inventory. The 19 sites consist of 15 prehistoric sites, three historic sites, and one multicomponent site. The 15 prehistoric sites consist of 10 lithic scatters and five open camps; the three historic sites consist of one foundation, one cairn, and one debris scatter; and the one multicomponent site is composed of a prehistoric open camp and historic debris scatter. Of the 19 sites, two are recommended as eligible for listing on the NRHP, seven are unevaluated, and 10 are recommended as not eligible for listing on the NRHP. Of the two NRHP-eligible sites, one is located within the proposed project area, while the other is located more than 0.5 mi west of the proposed project area.

The identification and evaluation of potential rural historic and traditional cultural landscapes within the APE for direct effects is ongoing.

Prehistoric Site Types

The 15 prehistoric sites and the one prehistoric component from the multicomponent site located

in the proposed project area can be grouped into two categories: open camp/habitation sites and lithic scatters/knapping stations. Five sites and the prehistoric component from the multicomponent site are classified as open camp habitation sites based on the presence of hearths, heat-altered rock, lithic debris, and diverse artifact assemblages (tools, milling implements, etc.). The prehistoric component from the multicomponent site is recommended as eligible for listing on the NRHP based on the potential for buried cultural deposits. The 10 prehistoric sites classified as lithic scatters/knapping stations are characterized by the presence of debris from the modification/reduction of stone and are generally associated with no other artifact types or features. One lithic scatter is recommended as NRHP-eligible based on the potential for buried cultural deposits. Based on existing regional data and the project area topography, additional prehistoric site types within the proposed project area may include rock alignments and cairns. These sites could possess traditional cultural importance for Native Americans and, following consultation with Native American Tribes, could potentially be classified as Traditional Cultural Properties (TCPs).

Historic Site Types

A total of three historic sites and one historic component from the multicomponent site have been recorded within the proposed project area. The sites consist of one foundation, one cairn, and one debris scatter, and the historic component from the multicomponent site is a debris scatter. The foundation has not been formally recorded and is currently unevaluated with regard to the NRHP. The two debris scatters are likely associated with historic stock-herding activities in the area, and both are not eligible for the NRHP.

3.2.1.2 Cultural Resources Within the APE for Visual Effects

In order to assess potential visual effects from the proposed project, a viewshed analysis was conducted using GIS software to delineate areas within the 20-mi visual APE from which the proposed project would be visible. Locations of previously recorded sites within the visual APE were obtained from the SHPO, Cultural Records Office, and merged with the results of the viewshed analysis. Any sites within areas from which the proposed project would not be visible due to intervening topography were eliminated from the visual effects analysis. A summary of the 163 identified prehistoric and historic sites for visual effects analysis is provided below. Additionally, the identification and evaluation of potential rural historic landscapes and traditional cultural properties within the APE for visual effects is ongoing.

Prehistoric Sites

The BLM, in consultation with Native American tribes, determined that sites for visual effects analysis would be identified based on site type rather than NRHP eligibility. The sites consist of those that contain sensitive features or remains that likely possess traditional cultural importance to modern Native Americans. Examples of such prehistoric sites include human burials, rock alignments, petroglyphs, rock cairns, stone circles, and modern-day Native American use for resource extraction, or religious sites. A total of 35 prehistoric sites were identified for visual effects analysis in areas within the visual APE where the proposed project would be visible.

Historic Sites

A total of 128 historic sites were identified for visual effects analysis in areas within the visual APE where the proposed project would be visible. These sites were identified based on NRHP eligibility status and consist of 87 eligible or listed sites and 41 unevaluatued sites. All historic sites that are not eligible were excluded from visual effects analysis as were sites that are eligible only under Criterion D in accordance with Appendix C of the State Protocol (BLM and SHPO 2006).

3.2.2 Native American Concerns

In accordance with the *American Indian Religious Freedom Act* (1979), the *Native American Graves Protection and Repatriation Act*, the NHPA, BLM Manual 8160-1 Handbook, and other statutes and

guidelines, Native American tribes were consulted during the preparation of this EA. The tribes retain all rights not explicitly ceded in the treaties transferring ownership to the federal government. The Northern Arapaho, Northern Ute, Eastern Shoshone, and Shoshone-Bannock tribes were sent letters requesting their comments concerning any religious or cultural areas within or near the WMWE project area. The scoping request for information regarding important cultural resources does not eliminate the need to consult with the tribes regarding claims made during the development stage. Consultation with each of the four tribes is ongoing. A summary of the activities conducted as part of the Native American consultation process through January 27, 2010, are provided in Appendix B.

Several known sensitive sites exist in the surrounding area, including Boars Tusk, the White Mountain Petroglyph Site, the Cedar Canyon Petroglyph Site, and Pilot Butte. These sites have the potential to be formally designated as TCPs by the federal government after implementing and completing formal Native American consultation. Furthermore, the identification and evaluation of a potential sacred landscape within the APE for visual and direct effects is ongoing.

3.3 GEOLOGY AND PALEONTOLOGY

The IAA for paleontological resources is the WMWE project area. A total of 420 acres (3.19%) of the 13,165-acre IAA has been disturbed, primarily by existing roads.

The WMWE project area is located on the western flank of the Rock Springs Uplift and the Green River Formation outcrops in the project area. The Green River Formation was formed during the Eocene Age, approximately 54.8 to 33.7 million years ago (Roehler 1992, 1993), and represents the deposits of an ancient lake system. The Green River Formation complexly intertongue is the result of expansions and contractions of the lake system (Roehler 1991). Paleontological resources in southwest Wyoming span the time from the late Cretaceous to early Tertiary and include remains of dinosaurs, mammals, turtles, crocodiles, and other reptiles, fish, snails, and plants.

The Green River Formation has a combined total thickness of 2,763 ft, measured in the Green River Basin (Roehler 1993), and the Green River Formation is an important sequence of ancient lake deposits occurring in three former lake areas: the Fossil Basin (ancient Fossil Lake), the Greater Green River Basin (ancient Lake Gosiute), and the combined Uinta-Piceance Creek Basins (ancient Lake Uinta). It is a famous source of fossils, especially in the Fossil Basin but also in all other areas, and has produced significant vertebrate, invertebrate, and plant fossil materials. In the WMWE project area, the Green River Formation is divided (from the bottom upwards) into the Wilkins Peak Member and the Laney Shale Member (Roehler 1992).

The Wilkins Peak Member of the Green River Formation is found south of Rock Springs. It, like the Cathedral Bluffs Tongue, has the Wasatchian-Bridgerian boundary within it, and much of the Wilkins Peak Member is evaporitic in nature and was deposited during times when lake levels were low and minerals became concentrated. It contains highly valuable trona deposits that are actively being mined west of Rock Springs. Much of the Wilkins Peak Member in the area near Rock Springs and White Mountain contains many radioactive beds that are both uraniferous and phosphatic, and it forms much of the eastern slopes of White Mountain (Love 1995). The Wilkins Peak Member characteristically weathers in a white color and presumably gave White Mountain its name. The Wilkins Peak Member is located along the east edge of the WMWE project area (Figure 3.1).

The Laney Shale Member of the Green River Formation consists of oil shale and resistant sandstone lentils at or near the base of the unit and an overlying unit of shale, mudstone, and limestone (Roehler 1993). South of Green River, oil shales are common near the base of the Laney Member (Culbertson 1962). The massive sandstone lenses in this lower unit appear to be restricted to the west-central part of the Greater Green River Basin, occurring mainly on White Mountain and for few miles to the west and southwest of it. The upper unit of the Laney Shale is much more widespread and occurs from the

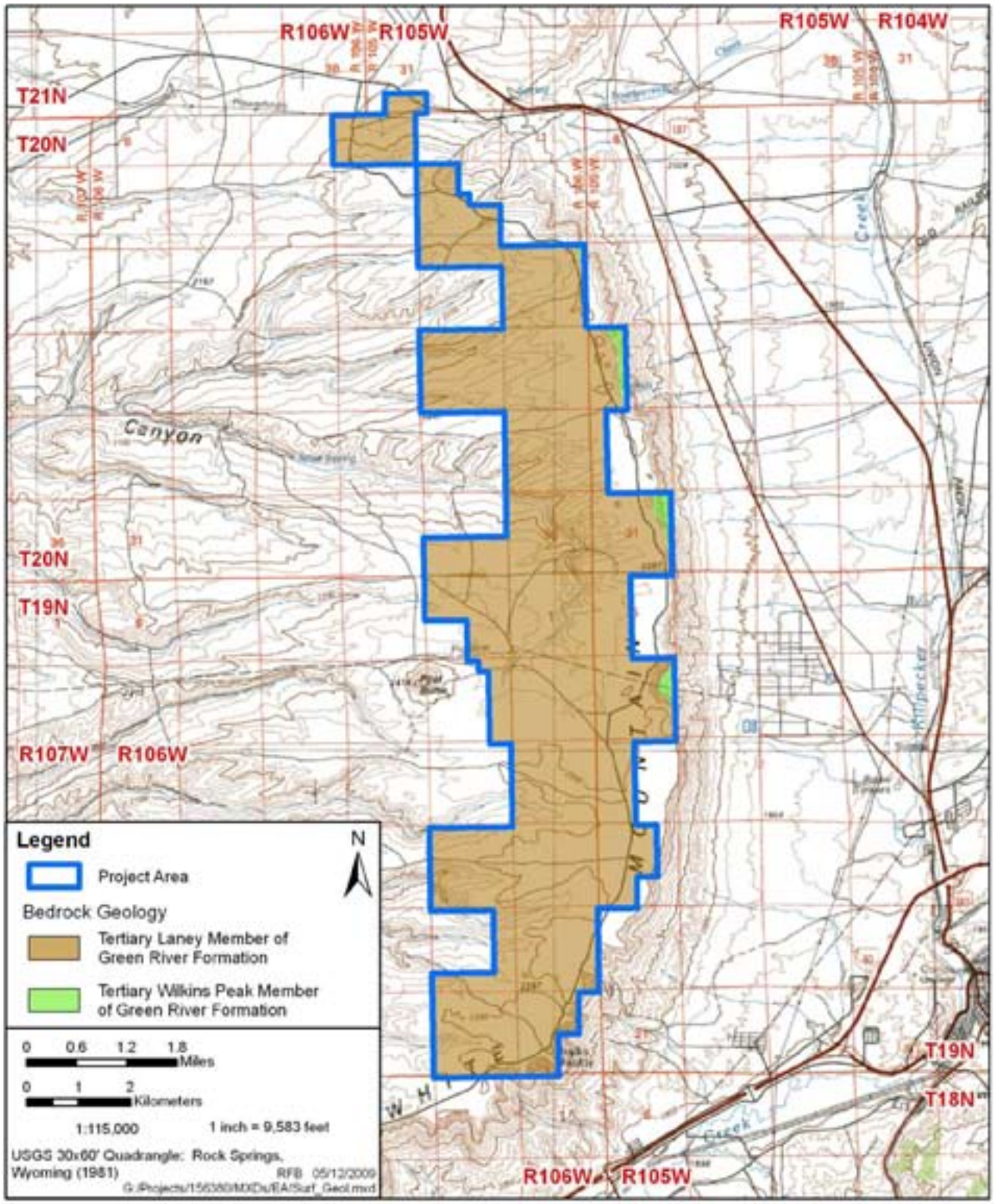

Figure 3.1 Surface Geology, WMWE Project.

west side of the Flaming Gorge Reservoir northwards into Sublette County and eastwards into the Washakie Basin. This unit is locally fossiliferous, with numerous localities in the Washakie Basin (Uinta Paleontological Associates, Inc. 2009). The Laney Shale Member makes up the majority of bedrock formation found within the WMWE project area (refer to Figure 3.1).

In order to assess the importance of various geological formations and the related paleontological resources associated with these formations, the BLM in Wyoming has adopted a classification system called the Probable Fossil Yield Classification (PFYC) system that provides broad probabilities for the occurrence of paleontological resources. The PFYC system is composed of five classes with Class 1 having the lowest probability of fossils to Class 5 having the highest probability of fossils. Class 5 areas are highly fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant nonvertebrate fossils.

Based on the PFYC system, the BLM has designated the Green River Formation (including the Wilkins Peak Member and Laney Shale Member) as Class 5 (Table 3.2). Despite this classification, no fossil localities are known to exist within the WMWE project area (Uinta Paleontological Associates, Inc. 2009).

However, several important fossil localities are known to occur in the general area. Even though there are no known fossil localities within the project area, the presence of rock units that have yielded important fossils elsewhere indicate that the probability of construction activities impacting important fossils may be high.

3.4 LAND USE

Land holdings within the project area are a checkerboard land pattern, with every other section alternating between public and private ownership. The checkerboard pattern is a result of land grants given to the railroad companies to develop transportation corridors in the west. The public lands are administered by the BLM RSFO. The RSGA has the grazing lease and is currently in control of a majority of the private lands within the project area.

3.4.1 Grazing

The IAA for grazing is the Rock Springs grazing allotment (Figure 3.2) located west of U.S. Highway 191 and north off Interstate 80 (I-80). A total of 9,734 acres (2.33%) of the 418,506-acre (20.31% of the allotment boundary) IAA has been disturbed primarily by major industrial facilities.

Livestock grazing on BLM-administered lands is authorized under the *Taylor Grazing Act of 1934.* The proposed project would be located within the Rock Springs grazing allotment (WY13018), which encompasses approximately 2,061,062 acres (refer to Figure 3.2).

The Rock Springs Allotment consists primarily of checkerboard land. Sections alternate from federal to private land, with approximately half being private land owned or leased by RSGA. There are a few others who own land within this allotment and are issued BLM permits. These are called "in-holders" because their land is found within RSGA holdings. Ninety-two percent of use occurs from December 1 to May 15 for cattle and sheep.

3.4.2 Recreation

No developed recreational sites or facilities exist within the WMWE project area; however, the BLM has established a scenic drive and wild horse viewing route along the rim of White Mountain utilizing County Road 53. Numerous dispersed recreational activities (e.g., hunting, camping, hiking, mountain biking, rock hounding, photography, wildlife and wild horse viewing, off-road vehicle [ORV] use, and sightseeing) are also available throughout the year due in part to the proximity of the WMWE project area to Rock Springs. In fiscal year 2008, 55,104 visitors accessed the Pilot Butte turnout at the center of the backcounty byway, and two outfitters are currently permitted to operate in the White Mountain/Little Colorado Wild Horse Herd Management Areas (WHHMAs) for the purpose of bringing tourists to view wild horses. All BLM-administered lands

Table 3.2 Geologic Formations and Fossil Potential, WMWE Project.

Formation	Member	Geology Map Abbreviation [1]	PFYC Rating Class [2]	Fossils Known in Formation/ Member	Records of Fossils in Project Area
Green River	Laney	Tgl	5	Yes	No
	Wilkins Peak	Tgwt	5	Yes	No

[1] Tgl = Tertiary Laney Member of the Green River Formation, Tgwt = Tertiary Wilkins Member of the Green River Formation

[2] PFYC rating (based on Potential Fossil Yield Classification system; BLM Instruction Memorandum No. 2009-001; October 10, 2008), where: 1 = very low potential; 2 = low potential; 3 = moderate or unknown potential; 4 = high potential; and 5 = very high potential (Uinta Paleontological Associates, Inc. 2009).

within the WMWE Project are currently open for public use.

3.4.3 Transportation

Access to the proposed project area is by way of County Road 53 and Fourteenmile Road from U.S. Highway 191. County Road 53 is the only maintained road in the proposed project area that runs the entire length of the proposed project area from north to south. A short segment of Fourteenmile Road is located within the northern portion of the proposed project area. Numerous two-track roads and trails occur throughout the project area.

3.5 NOISE

The IAA for noise resources is the project boundary plus 2.0 mi. A total of 4,402 acres (7.13%) of the 61,750-acre IAA has been disturbed, primarily by the city of Rock Springs and adjacent development.

Traffic on local and county roads, state highways, and I-80; recreational and off-road vehicle activity; road construction activities; trains; and wind are the primary sources of noise that may be audible within the project area. Noise-sensitive areas in the IAA include residential areas, hunting areas, occupied raptor nests, greater sage-grouse leks during the breeding and nesting season, and crucial big game winter range during critical winter periods.

The A-weighed sound pressure level, or A-scale, is used extensively in the U.S. for the measurement of community and transportation noise. The A-weighted decibel (dBA) scale measures sound levels over the entire range of audible frequencies, weighted to accommodate the fact that humans hear middle range frequencies better than high or low frequencies. The dBA of commonly heard sounds is presented in Table 3.3. Noise levels in rural landscapes are generally lowest in the early morning and in the evening when wind speeds are lower and highest in the afternoon when wind speeds are higher. A truck operating at 30 mph generates about 65 dBA at a distance of 300 ft; farm equipment likely is somewhat noisier (British Wind Energy Association 2009). Passenger cars traveling 50 mph generate about 65 dBA at 50 ft, and diesel trucks generate about 85 dBA at 50 ft, so near U.S. Highway 191 and I-80, traffic noise levels are likely in the range of 65 to 85 dBA (refer to Table 3.3).

Background noise was measured on White Mountain as part of the BLM wind energy program policies and BMPs on February 5 and 11, 2009. Noise measurements were taken every 0.5 mi along County Road 53 using an Extech sound level meter. Ambient noise levels ranged from 28 to 68 dBA on a calm day (February 5),

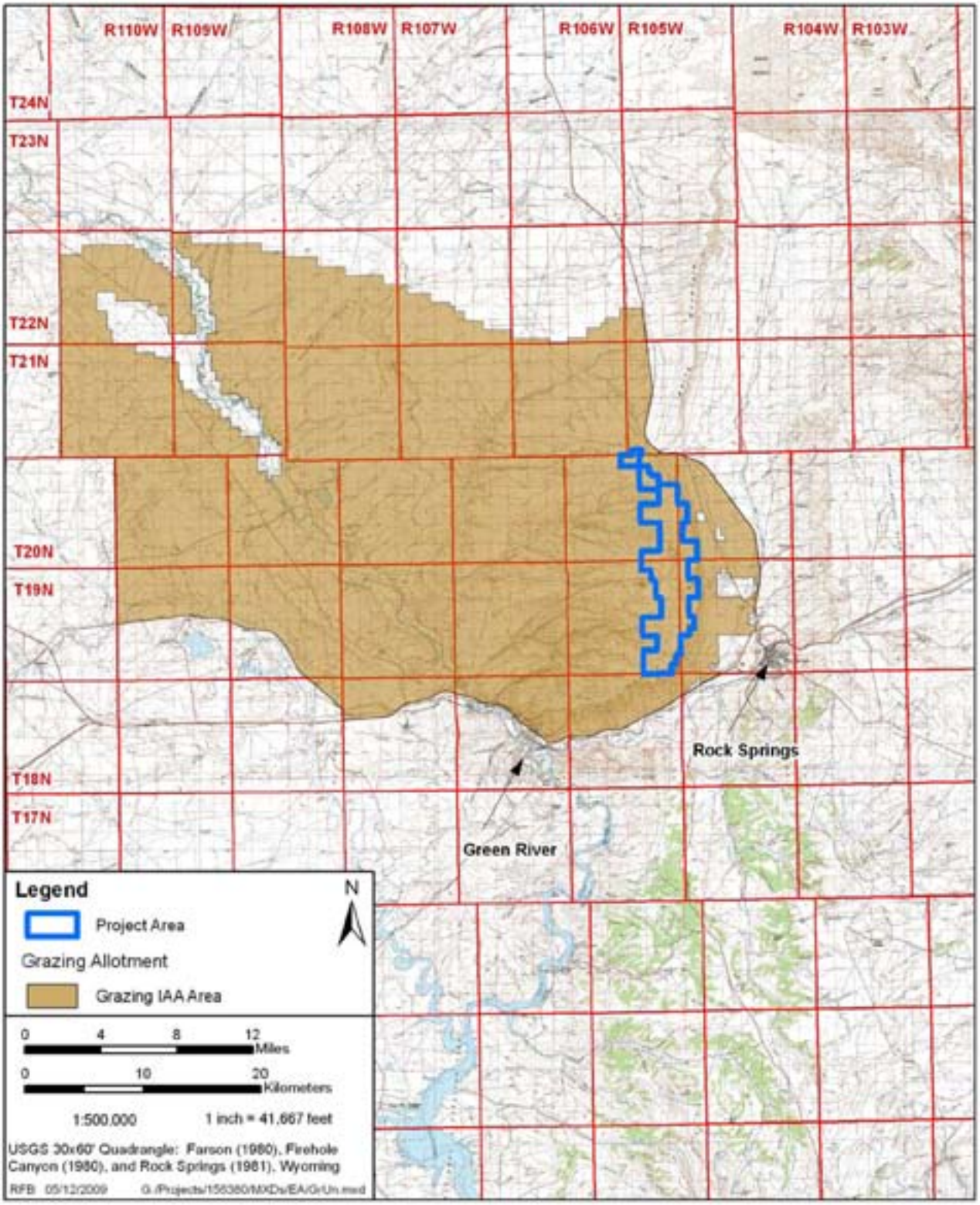

Figure 3.2 Grazing Allotment, WMWE Project.

Table 3.3 Noise Levels of Commonly Heard Sounds.[1]

Source/Activity	dBA [2]
Threshold of hearing	0
Rural night-time background	20-40
Normal conversation (at 3 ft)	60
Wind project at 1,100 ft	35-45
Car at 40 mph at 300 ft	55
Busy office	60
Truck at 30 mph at 300 ft	65
Jet aircraft at 800 ft	105
Threshold of pain to hearing	140

1 Source: British Wind Energy Association (2004) and Rau and Wooten (1980).
2 dBA = A-weighted decibels.

whereas ambient noise levels on an average windy day ranged from 47 to 90 dBA (Teton 2009).

The expected sound level for individual turbines at 130 ft is expected to be 55-65 dBA (Teton 2009), which is equivalent to a normal conversation. Therefore, on windy days when the turbines are turning, actual noise from the turbines is expected to be less than the ambient noise or near to the background noise levels.

3.6 SOCIOECONOMICS

3.6.1 Demography

Based on U.S. Census Bureau statistics (U.S. Department of Commerce [USDOC] 2009a), Sweetwater County's 2006 population was estimated at 38,763, a 3.1% increase in population from that of the 2000 decennial census, and only 60 people fewer than the population recorded in the 1990 decennial census (USDOC 2009b). In comparison, the State of Wyoming experienced a 4.3% increase in population between 2000 and 2006 (USDOC 2009b, 2009c).

According to the 2000 decennial census, Sweetwater County's labor force (individuals 16 years of age or older) was 70.6% of the population (20,022 individuals), with the number increasing to 73.6% (21,621) of the population in USDOC's 2005-2007 American Community Survey (USDOC 2009d, 2009e). In comparison, the U.S. labor force was only 64.7% of the population in the 2005-2007 surveys (USDOC 2009f). Most recent preliminary data place Sweetwater County's unemployment rate in July of 2009 at 6.5%, compared to a statewide 6.5% unemployment rate. The unemployment rate for Sweetwater County has increased 1.5% since July of 2009; whereas the Wyoming unemployment rate has remained the same. Nevertheless, Sweetwater County's December 2008 unemployment rate is approximately half of the July 2009 national average of 9.4% (Wyoming Department of Employment, Research & Planning 2009).

According to 2000 census data, Sweetwater County occupations in Wyoming were dominated by sales and office jobs (23.4% of the workforce); management, professional, and related occupations (23.3%); and construction, extraction, and maintenance jobs (21.1%); with production, transportation, and material moving (16.1%); service (15.9%); and farming, fishing, and forestry (0.2%) providing the remaining jobs (USDOC 2009d). Industry, education, health, and social

services (18.2%); agriculture, forestry, fishing, and mining (14.8%); and transportation, warehousing, and utilities (11.9%) dominated jobs in Sweetwater County, with all other industry classes comprising less than 10% each. Private wage and salary workers comprise 76.5% of the Sweetwater County workforce, followed by government workers (17.7%), self-employed/unincorporated business workers (5.6%), and unpaid family members (0.2%) (USDOC 2009d). Major employers in the county include FMC Wyoming Corporation (844 employees), Haliburton (755), Sweetwater County School District #1 (720), General Chemical (531), Solvay Minerals (428), OCI (428), PacifiCorp (393), Sweetwater Memorial Hospital (372), Schlumberger (335), Bridger Coal (319), and Sweetwater County School District #2 (290) (Why Wyoming.org 2009).

Annual per capita income for Sweetwater County in USDOC's 2005-2007 3-year Community Survey was $28,835 (in 2007 inflation-adjusted dollars) compared to $16,810 in 1990 (an increase of 71.5% over 17 years) (USDOC 2009e). The cost of living index for the county in the fourth quarter of 2008 was 107, compared to 97 in the second quarter of 2002 (Wyoming Economic Analysis Division 2003, 2009). The index uses 100 as the statewide average; thus, the cost of living was seven points below the statewide average in 2002, but by the end of 2008, it had climbed to seven points above the statewide average. In 2000, 7.8% of the Sweetwater County population was living below the poverty level (USDOC 2009d). That number increased to 8.1% in 2004 (USDOC 2009a, 2009b), but the 2005-2007 American Community Survey reported a drop to 7.2% (USDOC 2009e). In that same survey, the statewide percentage was considerably higher at 8.9%, although still well below the national average of 13.3% (USDOC 2009g).

As of the 2000 census, Sweetwater County reported 15,921 housing units, with one-unit detached structures comprising 58.8%, and mobile homes comprising 23.2%. No other structure type exceeded 4.2% of the total (USDOC 2009h). Occupancy was 88.6% of the total units, with 11.4% vacancies and 1.5% seasonal/recreational residences (USDOC 2009i). The 2005 through 2007 American Community Survey shows 16,480 housing units with 91.7% occupancy (an increase of 3.1% over the 2000 decennial census for both housing units and occupancy rate) (USDOC 2009e). The occupancy rate of Wyoming reported in the same 2005-2007 survey was 85.9 or 5.8% lower than that of the county (USDOC 2009j).

Thirty-one schools in two school districts served 6,964 students in the 2006-2007 school year, and the average student to teacher ratio was approximately 15:1. Western Wyoming Community College also enrolled 3,967 students in that year (Why Wyoming.org 2009).

The adjusted crime rate in Sweetwater County declined between 1995 and 2003, but is higher than the statewide crime rate (Pinedale Anticline Working Group [PAWG] 2005).

Electric power is provided to the county by Bridger Valley REA and Rocky Mountain Power. Costs (cents per KWh) range from $0.0502 (industrial) to $0.0837 (residential) for the former, and from $0.0381 (industrial) to $0.0688 (residential) for the latter (Why Wyoming.org 2009).

3.6.2 Health, Safety, and Transportation

The proposed project area is undeveloped, and no permanent residential structures occur within the proposed project area. County Road 53 runs the length of the project area. Access to the proposed project area is by way of County Road 53 and Fourteenmile Road from U.S. Highway 191. Therefore, the primary safety risks for people working or traveling in the general project area are related to vehicle accidents.

3.7 SOILS

The IAA for soil resources is the boundary of the level 12 Hydrologic Unit Code (HUC) (Figure 3.3). A total of 19,954 acres (7.43%) of the 268,613-acre IAA has been disturbed, primarily by cities.

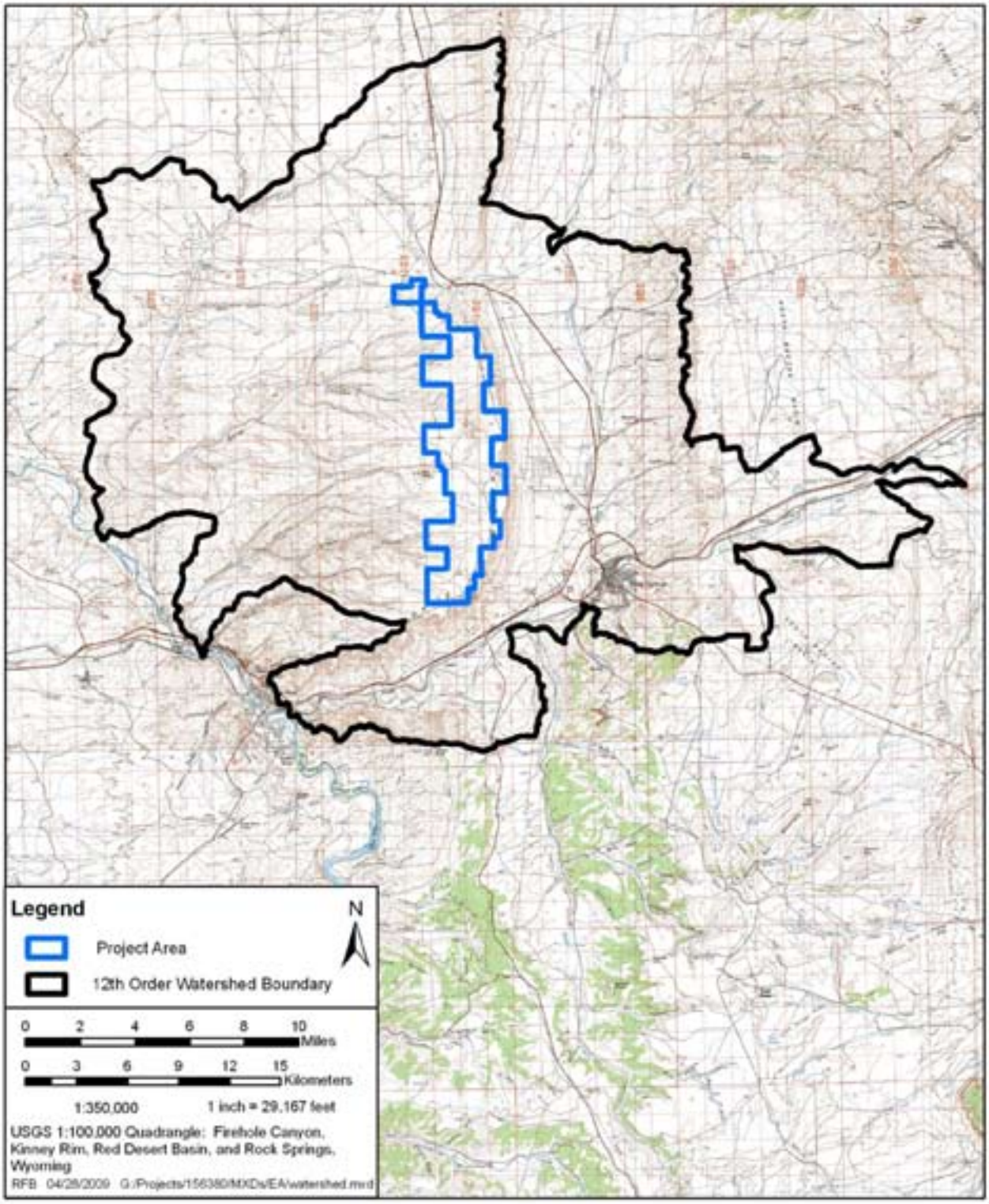

Figure 3.3 Location of Level 12 HUC.

The project area is primarily composed of Ustic haplargids soils (Figure 3.4). A second type, Ustic torriorthents, occurs along the extreme east side of the project area and is associated with the eastern side of the project area along the rim and sideslopes of White Mountain (BLM 1996; Munn and Arneson 1999).

The Ustic haplargids soils (Munn and Arneson 1999) are composed of Blackhall, Renrsac, Carmody, Grieves, Renot, Thermopolis, Elk Mountain, Blazon, Delphill, Redwash, Red Creek, and Shinbara soil types. These soils are shallow and moderately drained and formed on sloping upland plains with deep steep-sided ravines.

The Urtic torrienthents (Munn and Arneson 1999) are composed of Huguston, Wint, Spool, and Lamarsh soils, which occur on shallow soil rock outcrops, are well-drained, and were formed on steep ridges, escarpments, and mountain slopes.

Soils susceptible to surface disturbing activities include unstable soils, sandy soils, and erosive soils. Unstable soils are those soils or soil groups susceptible to landslides or slumping activity and may be a hazard to permanent structures. None of the soils within the WMWE project area are categorized as unstable soils (BLM 1996). Sandy soils are very susceptible to wind erosion when the protective vegetative cover is removed. The Huguston soil type is categorized as a sandy soil. Erosive soils are a result of their depth, texture, and/or position on the landscape. Huguston, Redwash, Thermopolis-Outcrop, Shinbara, Thermopolis, and Redwash-Spool-Outcrop are categorized as erosive soil types.

3.8 THREATENED, ENDANGERED, PROPOSED, CANDIDATE, AND BLM SENSITIVE SPECIES

The federal *Endangered Species Act* (16 U.S.C. 1531-1543) protects listed threatened and endangered plant and animal species and their critical habitats. A list of federally listed threatened, endangered, proposed, and candidate (TEPC) species that potentially occur in the vicinity of the proposed project was provided by the BLM RSFO through correspondence with the USFWS Wyoming State Office. Records of known occurrences of federal, state, and BLM sensitive species were queried from the Wyoming Natural Diversity Database (WNDD 2009).

TEPC species are those that have been specifically designated as such by the USFWS. Threatened species are those that are likely to become endangered in the foreseeable future throughout all or a significant portion of their range. Endangered species are those that are in danger of extinction throughout all or a significant portion of their range. Proposed species are those for which the USFWS has published proposed rules in the Federal Register for listing of the species but for which a final rule has not been adopted. Candidate species are those for which the USFWS has sufficient data to list as threatened or endangered but for which proposed rules have not yet been issued. BLM sensitive species are those that may warrant designation as candidate species but sufficient data are not currently available for such a designation decision; these species may be designated as BLM sensitive species by the BLM.

Based on WNDD (2009), no TEPC species occurrences have been documented in the project area; however, black-footed ferret and gray wolf have historically recorded occurrences within 6.0 mi of the project area.

3.8.1 TEPC Animal and Plant Species

The black-footed ferret (*Mustela nigripes*), a federal endangered species; the Canada lynx (*Lynx canadensis*), a federal threatened species; the gray wolf (*Canis lupus*), part of a nonessential experimental population; yellow-billed cuckoo (*Coccyzus americanus*), a federal candidate species; four Colorado River endangered fish species--bonytail chub (*Gila elegans)*, Colorado pikeminnow (*Ptychocheilus lucius)*, humpback chub (*Gila cypha)*, and razorback sucker (*Xyrauchen texanus*); blowout penstemon (*Penstemon haydenii*); and Ute ladies'-tresses (*Spiranthes diluvalis*), a federal threatened species have been identified by the USFWS and BLM RSFO as having potential to occur within or in the vicinity of the proposed project area (Table 3.4). No other TEPC species have been identified as

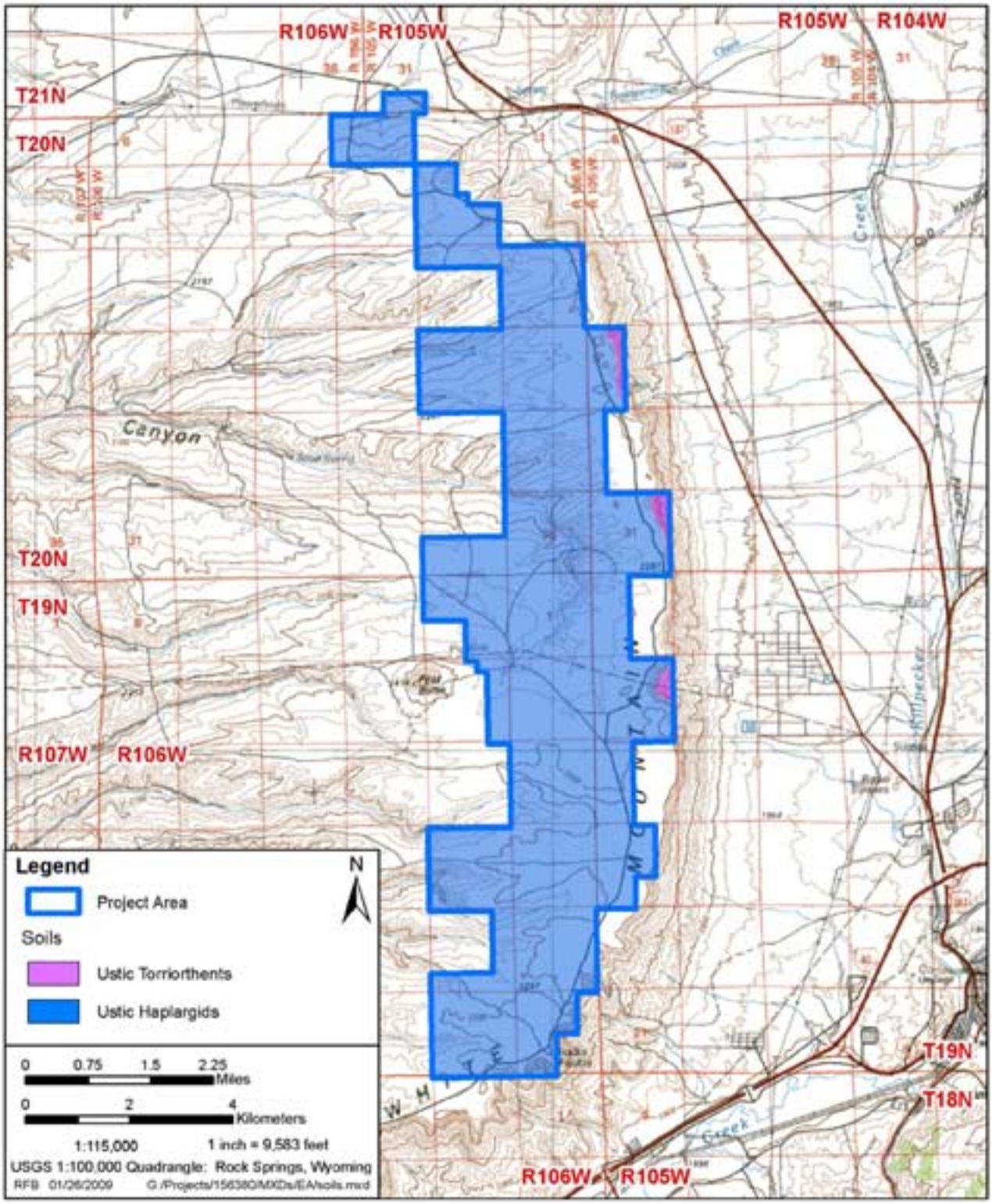

Figure 3.4 Soil Types, WMWE Project.

Table 3.4 Federal Threatened, Endangered, Proposed, and Candidate Species and Their Potential Occurrence Within the Proposed Project Area, 2009.[1]

Common Name	Scientific Name	Federal Status[2]	Potential Occurrence Within the Proposed Project Area[3]
MAMMALS			
Black-footed ferret	*Mustela nigripes*	E	X
Canada lynx	*Lynx canadensis*	T	X
Gray wolf	*Canis lupus*	XN	R
BIRDS			
Yellow-billed cuckoo	*Coccyzus americanus*	C	R
FISH			
Bonytail (Roundtail chub)	*Gila elegans*	E	X
Colorado pikeminnow	*Ptychocheilus lucius*	E	X
Humpback chub	*Gila cypha*	E	X
Razorback sucker	*Xyrauchen texanus*	E	X
PLANTS			
Blowout penstemon	*Penstemon haydenii*	E	X
Ute ladies'-tresses	*Spiranthes diluvialis*	T	X

[1] Adapted from USFWS (2008) and BLM (2009b).

[2] Federal status (USFWS 2008):
C = candidate
E = listed as federally endangered
T = listed as federally threatened
XN = nonessential experimental population

[3] Species occurrence, based on WNDD (2009) and BLM (2009)
R = Rare; species may pass through or be in the project area for just a few days or hours (e.g., stopping over during migration). Encounters during project construction are unlikely.
U = Uncommon; species may be present in the project area but in such low numbers or in such small and widely scattered populations that an encounter during field development and operation is unlikely. The species could be present for a significant part of the year (e.g., breeding season and/or summer resident).
X = Unlikely; no habitat present; there has been no recent or historical records of the species occurrence in the project area (WNDD 2009); probability of encountering the species during project construction is very unlikely.

potentially occurring within the project area (USFWS 2008).

Black-footed ferret. The black-footed ferret, a federally endangered species, was once distributed throughout the high plains of the Rocky Mountain and western Great Plains regions (Clark and Stromberg 1987; Forrest et al. 1985). Prairie dogs are the main food of black-footed ferrets (Sheets et al. 1972); few black-footed ferrets have been historically collected away from prairie dog towns (Forrest et al. 1985). The last known wild population of black-footed ferrets was discovered in the Pitchfork area near Meeteetse in 1981. Due to the fear that canine distemper would wipe out this population, all remaining black-footed ferrets were captured from the Pitchfork area and placed into a captive breeding project in 1985 (WGFD 1997). WNDD has three records of black-footed ferrets occurring within 6.0 mi of the project area; however, these records date to 1965 on the Seedskadee Wildlife Refuge area. The nearest known currently viable population of black-footed ferrets is located in the Coyote Basin Black-footed Ferret Management Area, southwest of Dinosaur National Monument, approximately 110.0 mi southwest of the proposed project area. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) defines potential black-footed ferret habitat as any white-tailed prairie dog town or complex greater than 200 acres. Although potential black-footed ferret habitat may occur within the WMWE project area, it is located outside any area requiring black-footed ferret surveys (USFWS 2004). In addition, no recent black-footed ferret observations have been recorded in the vicinity of the WMWE project area (WNDD 2009); therefore, it is unlikely that any black-footed ferrets would occur in the WMWE project area, and the species is not discussed further in this EA.

Canada Lynx. Canada lynx, a federally threatened species, are typically found at elevations above 4,000 ft in a mosaic of forest conditions ranging from early successional to mature coniferous and deciduous stands (Meaney and Beauvais 2004). Snowshoe hares are their primary prey, though tree squirrels, voles, and mice are also eaten. No potential habitat for Canada lynx occurs within the project area, and no known observations of Canada lynx within 6.0 mi of the project have been recorded (WNDD 2009); therefore, Canada lynx are not discussed further in this EA.

Gray Wolf. The gray wolf was re-introduced into the Greater Yellowstone ecosystem in 1995. Gray wolves in Wyoming are considered part of that nonessential experimental population (a nonessential experimental population designation refers to an experimental population whose loss would not be likely to appreciably reduce the likelihood of the survival of the species in the wild and is treated like proposed species under Section 7 of the *Endangered Species Act*), and they are managed as a proposed species outside of National Park Service or National Refuge System lands. Although those wolves remain listed and protected under the *Endangered Species Act*, additional flexibility is provided for their management under provisions of the final rule and special regulations promulgation for the nonessential experimental population on November 22, 1994 (published in 59 *Federal Register* 60252).

Gray wolves are large carnivores that are capable of living in a wide variety of habitats within specific established territories and depend on ungulates for food. The primary prey for wolves in the Yellowstone area is elk (87%), as well as moose, deer, antelope, and bison (Greater Yellowstone Winter Wildlife Working Group 1999; Clark and Stromberg 1987). At least 218 wolves in 25 packs were present within the greater Yellowstone ecosystem by the end of 2001 (Smith and Guernsey 2002). WNDD (2009) has a historic record of a gray wolf occurrence in the vicinity of the project area. While it is possible that gray wolf may pass through the project area, it is highly unlikely that the wolf would reside in the project area due to the lack of suitable habitat. In addition, based on regulatory status of the gray wolf as nonessential experimental population, the project would have no effect on this species; therefore, it is not discussed further in this EA.

Yellow-billed Cuckoo. Yellow-billed cuckoo is the only candidate species in Wyoming that may occur in the project area or vicinity (USFWS

2008). In Wyoming, the yellow-billed cuckoo is a rare summer breeder that arrives from wintering grounds in South America in late May and departs from September to October. The yellow-billed cuckoo is primarily found in open streamside deciduous woodland with low scrubby vegetation undergrowth bordering Wyoming's larger rivers. Cottonwood stands and willow thickets are preferred for nesting and foraging. The yellow-billed cuckoo has been identified as potentially occurring in the riparian areas west of the Continental Divide; however, it is highly unlikely that the yellow-billed cuckoo occurs in the project area since no riparian habitat is present and no observations have been recorded in the vicinity (WNDD 2009). The nearest potential yellow-billed cuckoo habitat is likely located along the Green River, approximately 6.5 mi southwest of the project area. Therefore, the yellow-billed cuckoo is not discussed further in this EA.

Colorado River Endangered Fish Species. The Recovery and Implementation Program (RIP) for Endangered Species in the Upper Colorado River Basin was initiated in January 1988 as a reasonable and prudent approach for projects to avoid jeopardizing the continued existence of the four species of Colorado River endangered fish--bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. Under the program, any depletions of water from tributaries within the Colorado River drainage system (which includes the project area) are considered by the USFWS to jeopardize the continued existence of these species. The USFWS has determined that progress made under the RIP has been sufficient to merit a waiver of the mitigation fee for depletions of 100 acre-ft or less (Memorandum dated March 9, 1995, to Assistant Regional Director, Ecological Services, Region 6, from Regional Director 6, "Intra-Service Section 7 Consultation for Elimination of Fees for Water Depletions of 100 acre-feet or Less from the Upper Colorado River Basin").

Blowout Penstemon. Blowout penstemon, a federally endangered species, is a perennial herb associated with blowout depressions in sparsely vegetated active sand dunes. Individual plants have deep root systems and multiple stems that can survive shifting sands. This species is known to occur in the sandhills of western Nebraska and in the Ferris Mountains of south-central Wyoming (Fertig 1999). No suitable habitat occurs in the project area; therefore, blowout penstemon is not discussed further in this EA.

Ute Ladies'-tresses. Ute ladies'-tresses, a federal threatened species, is a perennial member of the orchid family that inhabits moist streambanks, wet meadows, and abandoned stream channels at elevations of 4,500-6,800 ft (Fertig 1994; Spackman et al. 1997). Although the species will tolerate mildly alkaline conditions, it is unlikely to be found in association with Gardner's saltbush, greasewood, or other alkaline vegetation. Where it occurs in ephemeral drainages, groundwater is typically shallow (i.e., within approximately 18 inches of the ground surface) (personal communication, March 16, 2000, with Pat Deibert, USFWS; personal communication, March 22, 2000, with Walt Fertig, WNDD).

The species has been documented in Goshen, Converse, and Niobrara counties in Wyoming (Wyoming Rare Plant Technical Committee 1997) and along the Front Range in northern and central Colorado (Spackman et al. 1997). It also has been reported below the dam at Flaming Gorge Reservoir (personal communication, March 22, 2000, with Walt Fertig, WNDD). Although, in recent years, much time has been devoted to determining areas in Wyoming where the species occurs, it has not been documented within or near the proposed project area or in Sweetwater County (WNDD 2009) or within the BLM RSFO (BLM 2009b). Based on visual observation of the project area and descriptions for vegetation communities in the project area, there is no suitable habitat for Ute ladies'-tresses within or near the proposed project area, and Ute ladies'-tresses are not discussed further in this EA.

3.8.2 BLM Sensitive Animal and Plant Species

Based on habitat preference and geographic location, numerous BLM sensitive species may potentially occur or have been documented in the proposed project area (email communication, February 2, 2009, with Teri Deakins, BLM RSFO;

WNDD 2009; TRC 2009b) (Table 3.5). Potential habitat for long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat, white-tailed prairie dog, Wyoming and Idaho pocket gophers, bald eagle, ferruginous hawk, mountain plover, burrowing owl, midget faded rattlesnake, and Cedar Rim thistle occurs within or in the vicinity of the proposed project area (WNDD 2009). Sagebrush-obligate species on the BLM sensitive animal species list that might also occur in project area include pygmy rabbit, greater sage-grouse, sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow. BLM sensitive species observed (TRC 2009b) or recorded (WNDD 2009) in the project area include pygmy rabbit, ferruginous hawk, greater sage-grouse, sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow (refer to Table 3.5). Species listed on Table 3.5 as not having any potential habitat are not discussed further in this EA.

Pygmy Rabbit. Pygmy rabbits prefer areas of dense and tall sagebrush in predominantly sandy soils (Clark and Stromberg 1987). Burrows are typically located in areas with greater cover and shrub densities, taller vegetation, and high forb density (Ulmschneider 2004). Pygmy rabbit habitat occurs throughout the project area as inclusions of preferred vegetation densities and heights within Wyoming big sagbrush communities. Potential pygmy rabbit habitat also occurs in drainage bottoms where sagebrush and vegetation tend to be taller and denser and soils are deeper, thereby providing good cover and easier burrow excavation areas. Pygmy rabbits were observed by TRC during the 2008 avian migration studies and occur in the WMWE project area.

Wyoming Pocket Gopher. The Wyoming pocket gopher is exclusive to Wyoming. Specifically, it is only found in south-central Wyoming in Carbon and Sweetwater counties (Clark and Stromberg 1987). The WMWE Project is along the western-most edge of the known geographic range of this species. Two similar looking species of pocket gophers, the northern and Idaho pocket gopher, may occur within the range of the Wyoming pocket gopher, making field identification difficult. Positive identification requires karyotype (chromosomal) analysis, but morphological differentiating characteristics are being developed. Because the Wyoming pocket gopher is similar in appearance to more common and widely distributed northern pocket gopher, many earlier collections and observations of the Wyoming pocket gopher were misidentified; therefore, little is known about the population status of this species. Studies have recently been conducted to determine the distribution and population of this species, as well as the development of predictive models to determine potential habitat (Keinath and Beauvais 2006; Hayden-Wing Associates, LLC 2008; Keinath and Griscom 2009). The Wyoming pocket gopher prefers to inhabit dry gravelly ridges as opposed to valley bottoms with deeper soils, areas where other gophers prefer (Hayden-Wing Associates, LLC 2008). Recent studies have found Wyoming pocket gophers in small islands of low vegetation within a sagebrush matrix with cushion plants, grass, rabbitbrush, and low shrubs. Wyoming pocket gophers have not been found in flats dominated by greasewood, valley bottoms, sand dunes, or areas where medium to high Wyoming big sagebrush dominated the vegetation community (Keinath and Griscom 2009). Pocket gophers in general spend most of their life underground and are important in soil development, soil aeration, and promoting water storage in soil during spring runoff (Keinath and Beauvais 2006). No recorded occurrences of Wyoming pocket gopher are documented in the WMWE project area (WNDD 2009). The nearest known records of the Wyoming pocket gopher are east of Rock Springs (Hayden-Wing Associates, LLC 2008). Predictive models developed by Keinath and Griscom (2008) indicate that the WMWE project area is in a "predicted absent-marginal" and "predicted present-marginal" area for Wyoming pocket gopher.

Idaho Pocket Gopher. The Idaho pocket gopher is endemic to southwestern Wyoming and southeastern Idaho, extending slightly into southwestern Montana and northern Utah (Beauvais and Dark-Smiley 2005). This species prefers shallow stony soils in open sagebrush, grassland plains, and subalpine meadow habitats.

Table 3.5 Wyoming BLM Sensitive Species, Habitat Preference, and Occurrence of Habitat and Observational Data, WMWE Project, 2009. [1, 2]

Common Name	Scientific Name	Habitat	Potential Habitat in or in Vicinity of Project Area	Observed ?/ Occurrence Data
MAMMALS				
Grizzly bear	*Sorex nanus*	Forest, basin prairie, and meadows	No	No/No known data of occurrence
Long-eared myotis	*Myotis evotis*	Conifer and deciduous forests, caves, and mines	Yes	Yes/2008 bat field survey, WNDD 2009 data within 6.0 mi of project area
Fringed myotis	*Myotis thysanodes*	Conifer forests, woodland-chaparral, caves, and mines	Yes	Yes/2008 bat field survey
Spotted bat	*Euderma maculatum*	Cliffs over perennial water, basin-prairie shrub	Yes	Yes/2008 bat field survey
Townsend's big-eared bat	*Corynorhinus townsendii*	Forests, basin-prairie shrub, caves, and mines	Yes	Yes/2008 bat field survey, WNDD 2009 data within project area
Pygmy rabbit	*Brachylagus idahoensis*	Basin-prairie and riparian shrub	Yes	Yes/2008 avian migration studies, WNDD 2009 data within 6.0 mi of project area
White-tailed prairie dog	*Cynomys leucurus*	Basin-prairie shrub, grasslands	No	No towns observed/ WNDD 2009 has records in area
Wyoming pocket gopher	*Thomomys clusius*	Dry gravelly shallow soil, ridgetops rather than deeper soiled swales and valley bottoms	Yes	No/No known data of occurrence
Idaho pocket gopher	*Thomomys idahoensis*	Dry gravelly shallow soil, ridgetops rather than deeper soiled swales and valley bottoms	Yes	No/No known data of occurrence
Swift fox	*Vulpes velox*	Grasslands	No	No/No known data of occurrence
BIRDS				
Bald eagle	*Haliaeetus leucocephalus*	Cliffs, large trees, or sheltered canyons for nesting, near water sources for foraging	No	No/No known data of occurrence
White-faced ibis	*Plegadis chihi*	Marshes, wet meadows	No	No/No known data of occurrence
Trumpeter swan	*Cygnus buccinator*	Lakes, ponds, rivers	No	No/WNDD 2009 data within 6.0 mi of project area
Northern goshawk	*Accipter gentilis*	Conifer and deciduous forests	No	No/WNDD 2009

Table 3.5 (Continued)

Common Name	Scientific Name	Habitat	Potential Habitat in or in Vicinity of Project Area	Observed ?/ Occurrence Data
Ferruginous hawk	*Buteo regalis*	Basin-prairie shrub, grassland, rock outcrops	Yes	Yes/2008 avian migration studies, WNDD 2009 data
Peregrine falcon	*Falco peregrinus*	Tall cliffs	No	No/No known data of occurrence
Greater sage-grouse breeding habitat	*Centrocercus urophasianus*	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes/2008 avian migration surveys
Greater sage-grouse wintering habitat	*Centrocercus urophasianus*	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes/2008 winter greater sage-grouse surveys
Long-billed curlew	*Numenius americanus*	Grasslands, plains, foothills, wet meadows	No	No/No known data of occurrence
Mountain plover	*Charadrius montanus*	Grassland and desert shrub/grasslands with level areas (<3% slope) with at least 30% bare ground	Yes	No/No known data of occurrence; none observed during 2008 avian surveys
Burrowing owl	*Athene cunicularia*	Grasslands, basin-prairie shrub	Yes	No/No known data of occurrence
Sage thrasher	*Oreoscoptes montanus*	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes/2008 avian migration studies, WNDD 2009 data
Loggerhead shrike	*Lanius ludovicianus*	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes/2008 avian migration studies
Brewer's sparrow	*Spizella breweri*	Basin-prairie shrub	Yes	Yes/2008 avian migration studies
Sage sparrow	*Amphispiza belli*	Basin-prairie shrub, mountain-foothill shrub	Yes	Yes/2008 avian migration studies
FISH				
Roundtail chub	*Gila robusta*	Colorado River drainage, mostly large rivers, also streams and lakes	No	No/WNDD 2009 has record within 6.0 mi of project area
Leatherside chub	*Gila copei*	Bear, Snake, and Green rivers' drainages, clear, cool streams and pools	No	No/No known data of occurrence
Bluehead sucker	*Catostomus discobolus*	Bear, Snake, and Green rivers' drainages, all waters	No	No/WNDD 2009 has record within 6.0 mi of project area
Flannelmouth sucker	*Catostomus latipinnis*	Colorado River drainage, large rivers, streams and lakes	No	No/No known data of occurrence
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	Colorado River drainage, clear mountain streams	No	No/No known data of occurrence
REPTILES				
Midget faded rattlesnake	*Crotalus viridis concolor*	Mountain foothills shrub, rock outcrop	Yes	No/No known data of occurrence

Table 3.5 (Continued)

Common Name	Scientific Name	Habitat	Potential Habitat in or in Vicinity of Project Area	Observed ?/ Occurrence Data
AMPHIBIANS				
Northern leopard frog	*Rana pipiens*	Beaver ponds, permanent water in plains and foothills	No	No/No known data of occurrence
Great basin spadefoot	*Spea intermontana*	Spring seeps, permanent and temporary waters	No	No/WNDD 2009 has record within 6.0 mi of project area
Boreal (Northern Rocky Mountain population) toad	*Bufo boreas boreas*	Pond margins, wet meadows, riparian areas	No	No/No known data of occurrence
Spotted frog	*Ranus pretiosa (lutieventris)*	Ponds, sloughs, small streams	No	No/No known data of occurrence
PLANTS				
Meadow pussytoes	*Antennaria arcuata*	Moist, hummocky meadows, seeps or springs surrounded by sage/grasslands, 4,950-7,900 ft	No	No/No known data of occurrence
Small rock cress	*Arabis pusilla*	Cracks/crevices in sparsely vegetated granite/pegmatite outcrops within sage/grasslands, 8,000-8,100 ft	No	No/No known data of occurrence
Mystery wormwood	*Artemisia biennis* var. *diffusa*	Clay flats and playas, 6,500 ft	No	No/No known data of occurrence
Nelson's milkvetch	*Astragalus nelsonianus* or *Astragalus pectinatus* var. *platyphyllus*	Alkaline clay flats, shale bluffs, and gullies, pebbly slopes and volcanic cinders in sparsely vegetated sagebrush, juniper, and cushion plant communities at 5,200-7,600 ft	No	No/No known data of occurrence
Precocious milkvetch	*Astragalus proimanthus*	Cushion plant communities on rocky clay soils mixed with shale on summits and slopes of white shale hills, 6,800-7,200 ft	No	No/No known data of occurrence
Cedar Rim thistle	*Cirsium aridum*	Barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws, 6,700-7,200 ft	Yes	No/BLM personal communication
Ownbey's thistle	*Cirsium ownbeyi*	Sparsely vegetated shaley slopes in sage and juniper communities, 6,440-8,400 ft	No	No/No known data of occurrence
Wyoming tansymustard	*Descurainia torulosa*	Sparsely vegetated sandy slopes at base of cliffs of volcanic breccia or sandstone, 8,300-10,000 ft	No	No/No known data of occurrence

Table 3.5 (Continued)

Common Name	Scientific Name	Habitat	Potential Habitat in or in Vicinity of Project Area	Observed ?/ Occurrence Data
Large-fruited bladderpod	*Lesquerella macrocarpa*	Gypsum-clay hills and benches, clay flats, and barren hills, 7,200-7,700 ft	No	No/No known data of occurrence
Stemless beardtongue	*Penstemon acaulis* var. *acaulis*	Cushion plant or Black sage grassland communities on semi-barren rocky ridges, knolls, and slopes at 5,900-8,200 ft	No	No/No known data of occurrence
Beaver Rim phlox	*Phlox pungens*	Sparsely vegetated slopes on sandstone, siltstone, or limestone substrates, 6,000-7,400 ft	No	No/No known data of occurrence
Tufted twinpod	*Physaria condensata*	Sparsely vegetated shale slopes and ridges, 6,500-7,000 ft	No	No/No known data of occurrence
Green River greenthread	*Thelesperma caespitosum*	White shale slopes and ridges of Green River Formation, 6,300 ft	No	No/WNDD 2009 has record with 6.0 mi of project area
Uinta greenthread	*Thelesperma pubescens*	Sparsely vegetated benches and ridges on coarse cobbly soils of Bishop Conglomerate, 8,200-8,900 ft	No	No/No known data of occurrence

[1] Based on BLM (2009).
[2] Based on WNDD (2009) and TRC (2009b).

Population status is unknown due to the lack of field data, but the species is assumed to be rare with a limited distribution. The Idaho pocket gopher is very similar in appearance to other pocket gophers such as the Wyoming and northern pocket gophers; therefore, a reliable identification requires a karyotype analysis. In Wyoming, the Idaho pocket gopher is known to occur in Uinta, Lincoln, and Sublette counties whereas the Wyoming pocket gopher is limited to Sweetwater and Carbon counties. The northern pocket gopher occurs throughout Wyoming (Beauvais and Dark-Smiley 2005). There are no known occurrences of the Idaho pocket gopher in or in the vicinity of the WMWE project area (WNDD 2009; WGFD 2004), and this species will not be discussed further in this EA.

Greater Sage-grouse. The IAA for greater sage-grouse is the area north of Bitter Creek, east of the Green River, south of the Big Sandy River to Farson, then east to Killpecker Sand. A total of 10,401 (1.91%) of the 545,351-acre IAA has been disturbed, primarily by roads.

As indicated, the WMWE project area occurs within Upland Game Bird Management Area (UGBMA) #7 (Eden) and is approximately 1.0 mi northwest of the adjacent UGBMA #6 (Flaming Gorge) (Figure 3.5). UGBMA #7 encompasses approximately 4,541 mi^2 and generally is bounded on the south by I-80 from Green River east to approximately Superior, then north to midway between Pinedale and Lander, then southwest to Big Piney and southeast back to Green River. UGBMA #6 generally encompasses approximately 3,615 mi^2 in the western approximately two-thirds of the south half of Sweetwater County. It includes the Flaming Gorge area and is bounded on the south by the Wyoming/Colorado border.

Greater sage-grouse are a BLM sensitive species that are being considered for listing under the *Endangered Species Act*. During the spring and fall avian surveys, 226 grouse observations were recorded as part of the continuous raptor and other large bird (RLB) surveys, and passerine and other small bird (PSB) surveys. A total of 50 observations (22%) were made during the spring, and 176 observations (78%) were made during the fall. Sixty-two percent of the greater sage-grouse were seen flying or flushed to flying, and 38% of the sightings stayed on the ground (i.e., did not flush or fly). For those greater sage-grouse that did fly, 100% were observed flying within the 0 to 35-m flight height category (i.e., below the rotor-swept area), and these birds would not be at risk for collision with a wind turbine (i.e., risk index of 0.0) (TRC 2009b).

Based on the WNDD (2009) data for the WMWE project area, 1,812 greater sage-grouse observations have been documented within the project area, based on 23 years of observation between 1973 and 2006. These data indicated that there were 1,545 observations of adults and 267 observations of juveniles or yearlings.

As a result of concern for the current and future population status of greater sage-grouse and their habitat, Wyoming Governor Dave Fruedenthal requested a Sage-grouse Implementation Team (SGIT) to identify actions and measures that would be useful in managing greater sage-grouse and their habitats in Wyoming. As a result of this effort, initial Core Population Areas for greater sage-grouse were identified within the state of Wyoming. Those Core Habitat Areas encompass habitats and existing populations for at least two-thirds of the greater sage-grouse in Wyoming (SGIT 2008). SGIT predicted that approximately 83% of the peak males attending leks in Wyoming are within core areas, as are approximately 61% of the occupied leks in the state. The SGIT recommends that management within the core areas focus on maintenance and enhancement of grouse habitats and populations in those areas. An ongoing mapping and ground-truthing effort is being conducted by Wyoming Geographic Information System Center (WYGISC) in cooperation with SGIT to further evaluate and refine the core management areas.

Approximately 515 acres (3.9%) of the WMWE project area are within the identified 2.5-million acre South Pass Core Habitat Area for greater sage-grouse. The entirety of this specific Core Habitat Area occurs in the northernmost portion of the project area (refer to Figure 3.5).

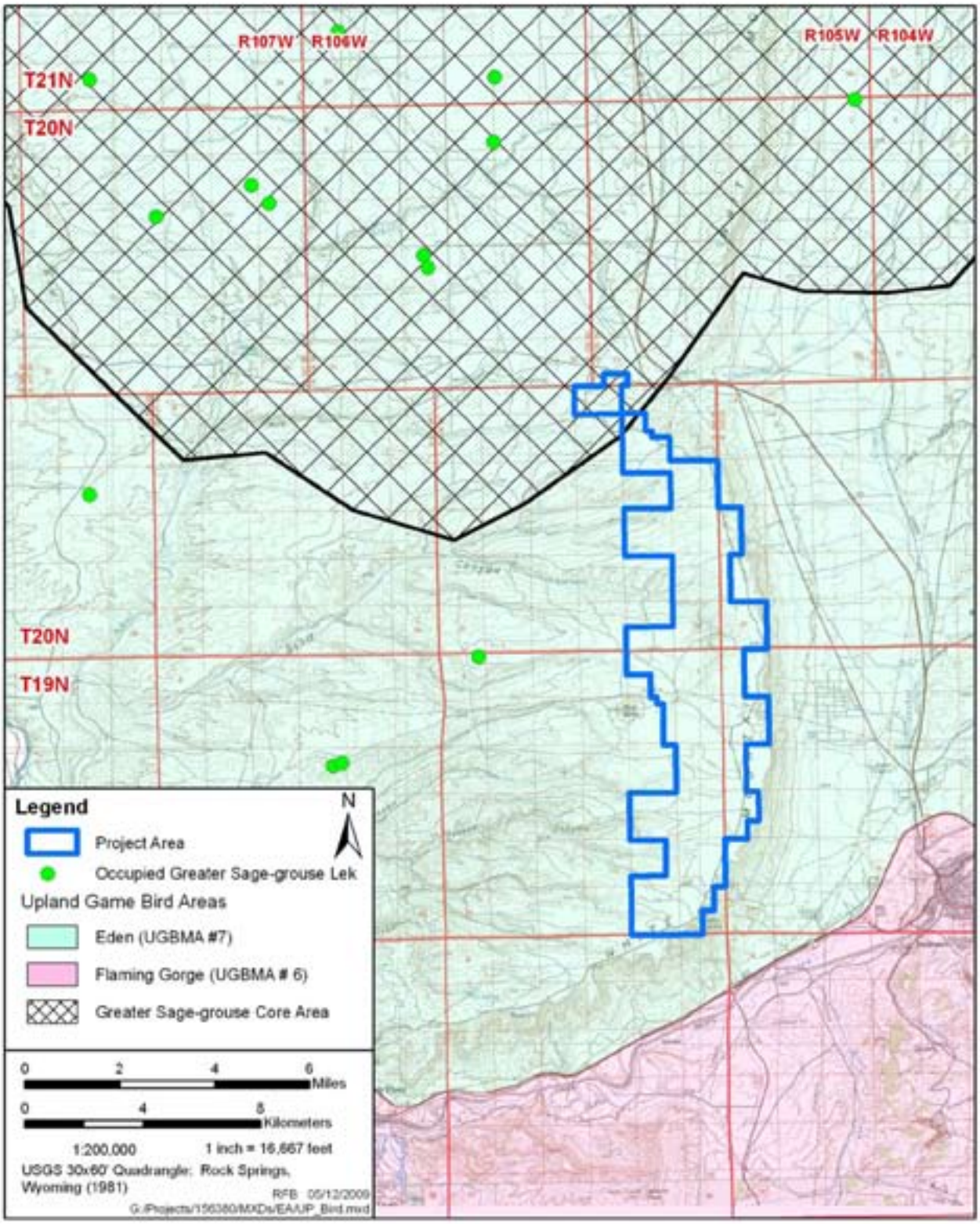

Figure 3.5 Upland Game Bird Areas and Greater Sage-grouse Core Habitat Area, WMWE Project.

The project area and vicinity provide suitable nesting, brood-rearing, and wintering habitat for greater sage-grouse, which rely heavily on sagebrush for food, as well as thermal and hiding cover during all seasons and throughout all age classes. On February 29, 2008, an aerial survey was conducted for wintering greater sage-grouse within the WMWE project area and an adjacent 213-mi^2 survey area as requested by BLM RSFO (TRC 2008a). Eighty-four greater sage-grouse were observed during that winter survey; however, none were observed within the WMWE project area. The project area, as well as much of the rest of the eastern two-thirds of the surveyed area, had fairly high snow cover relative to available forage at the time of the survey, and numerous golden eagles (which prey on greater sage-grouse) were observed during the survey. These two factors may explain the scarcity of greater sage-grouse recorded in the project area and immediately adjacent areas during the winter survey (TRC 2008a).

An aerial greater sage-grouse lek survey of the 213-mi^2 above-referenced area was conducted from April 4 through April 6, 2008 (TRC 2008b). The BLM identified a new lek on May 10, 2009, and this is located approximately 3.1 mi west of the WMWE project area (personal communication, May 11, 2009, with Nick Kaczor, BLM RSFO Biologist). Based on results of that survey, and BLM and WGFD data, the lek nearest to the WMWE project area is approximately 3.1 mi west, and only one other lek is located within 4.0 mi of the project area.

Greater sage-grouse likely breed and raise their broods in or adjacent to the project area. Fifty (22%) greater sage-grouse were recorded during spring 2008 surveys conducted in conjunction with this project (TRC 2009b). Observations occurred throughout all three months (April-June) of the spring surveys. One hundred and seventy-six (78%) individuals were observed during similar surveys in the fall (August-October). The majority of grouse observations during the spring and fall surveys were recorded in October (117 individuals), followed by September (35) and August (27) (TRC 2009b).

Mountain Plover. Mountain plovers are documented as breeding throughout Wyoming (WGFD 1999). Graul and Webster (1976), Parrish et al. (1993), and Knopf (1996) noted that mountain plover nests were found in areas with at least 30% bare ground, vegetation was short (<4 inches) in spaced clumps or mats (e.g., cushion plants), and terrain was flat or less than 3% slope. Mountain plovers in the general project area are found in cushion plant communities and on windswept ridges (personal communication, June 10, 2002, with Lorraine Keith, BLM RSFO). Mountain plover breeding/nesting habitat is often associated with active prairie dog towns (Dinsmore 2003). In Colorado, the mountain plover diet is composed of 99.7% arthropods, with beetles, grasshoppers, crickets, and ants as the most important food items (Baldwin 1971).

A portion of proposed project area is composed of greasewood fans and flats and basin exposed rock with areas that are relatively void of vegetation. These areas could provide suitable nesting and foraging habitat for mountain plover; however, no mountain plovers were observed during 21+ weeks of diurnal and nocturnal avian migration studies conducted in 2008 (TRC 2009b), and no mountain plover observations have been recorded in the vicinity of the proposed WMWE project area (WNDD 2009).

Bald Eagle. Bald eagles require cliffs, large trees, or sheltered canyons associated with concentrated food sources (e.g., fisheries or waterfowl concentration areas) for nesting and/or roosting areas (Edwards 1969; Snow 1973; Call 1978; Steenhof 1978; Peterson 1986). Bald eagles forage over wide areas during the nonnesting season (i.e., fall and winter) and scavenge on animal carcasses such as pronghorn, deer, and elk.

No bald eagle nests or winter roosts are known to occur in the proposed project area or immediate project area, and no observations were made during avian studies conducted in 2008 (TRC 2008c, 2009b; WNDD 2009). However, the Green River, approximately 6.5 mi southwest of the proposed project, provides favorable nesting, roosting, and foraging habitat for bald eagles, and

it is likely that individuals occasionally forage in or fly through the WMWE project area.

Midget Faded Rattlesnake. The midget faded rattlesnake is currently considered a subspecies of the common western rattlesnake (*Crotalus viridis*). This species mainly occupies the Colorado Plateau of eastern Utah, western Colorado, and southwestern Wyoming on the Green River formation, typically below 7,000 ft in elevation. The midget faded rattlesnake is shy and inhabits rocky and arid basins. Exposed rocky outcrops and ledges are important habitat features because they provide safe hibernacula, escape cover, and thermal cover and have been identified as the main environmental limit to distribution and abundance (Travsky and Beauvais 2004). There are recorded occurrences of midget faded rattlesnake within the WMWE project area and vicinity (WNDD 2009).

Cedar Rim Thistle. The Cedar Rim thistle is a perennial tap-rooted herb with stems up to 30 cm tall. The flowering and fruiting period for this species is June through July. This species occurs on barren slopes, fans, and draws on whitish-gray sandstone, chalk, tufaceous colluvium, or clay substrates derived from the split Rock, White River, Wagon Bed, Wind River, Green River, and Wasatch formations. Populations are found in sparsely vegetated openings within Wyoming big sagebrush grasslands at 5,800 to 7,500 ft (WNDD 2000). There are no recorded occurrences within the WMWE project area, and the nearest known population of Cedar Rim thistle is approximately 40.0 mi south of the WMWE project area (WNDD 2009). However, the BLM has a historic record indicating an observation within 1.5 mi of the WMWE project area (personal communication, August 31, 2009, with Jim Glennon, BLM, RSFO).

It should be noted that other BLM sensitive species such as ferruginous hawks, sagebrush obligate species, and BLM sensitive bat species are addressed in Section 3.12 of this EA.

3.9 VEGETATION (INCLUDING INVASIVE SPECIES AND WETLANDS)

The IAA for vegetation resources is the boundary of the level 12 HUC. A total of 19,828 acres (7.43%) of the 268,613-acre IAA has been disturbed, primarily by cities.

The occurrence of individual species and plant communities depend on factors such as topography, parent rock material, elevation, aspect, and slope. These in turn influence moisture levels and solar radiation (Knight 1994; Young and Singleton 1977).

Based on Wyoming Gap Analysis 1:100,000 scale mapping (Figure 3.6), three vegetation types occur within the proposed project area. Vegetation types include 11,452 acres (87%) of Wyoming big sagebrush community, 1,097 acres (8%) of greasewood fans and flats community, and 616 acres (5%) of basin exposed rock/soil communities (Wyoming Gap Analysis 1996). These vegetation communities and species occurring in the proposed project area are common throughout the region. Vegetation within the Wyoming big sagebrush community consists primarily of Wyoming big sagebrush and rabbitbrush, with scattered bitterbrush, horsebush, and winterfat and an understory of grasses and forbs such as western wheatgrass, prairie junegrass, needle-and-thread grass, Sandberg bluegrass, broom snakeweed, and phlox. The greasewood fans and flats vegetation community is associated with drainages that flow west out of the project area (refer to Figure 3.6). Species occurring within this type are predominantly composed of greasewood and Gardener's saltbush, with an understory of western wheatgrass, needle-and-thread grass, alkali sacaton, Sandberg bluegrass, and cushion plant communities. The basin exposed rock areas are associated with the rim along White Mountain where the ground is windblown and vegetation is sparse. Gardner saltbush and cushion plant species such as phlox, sandwort, and buckwheats are the primary species occurring in this type. Pockets of mountain mahogany and antelope bitterbrush and scattered junipers occur in areas downslope of the rim

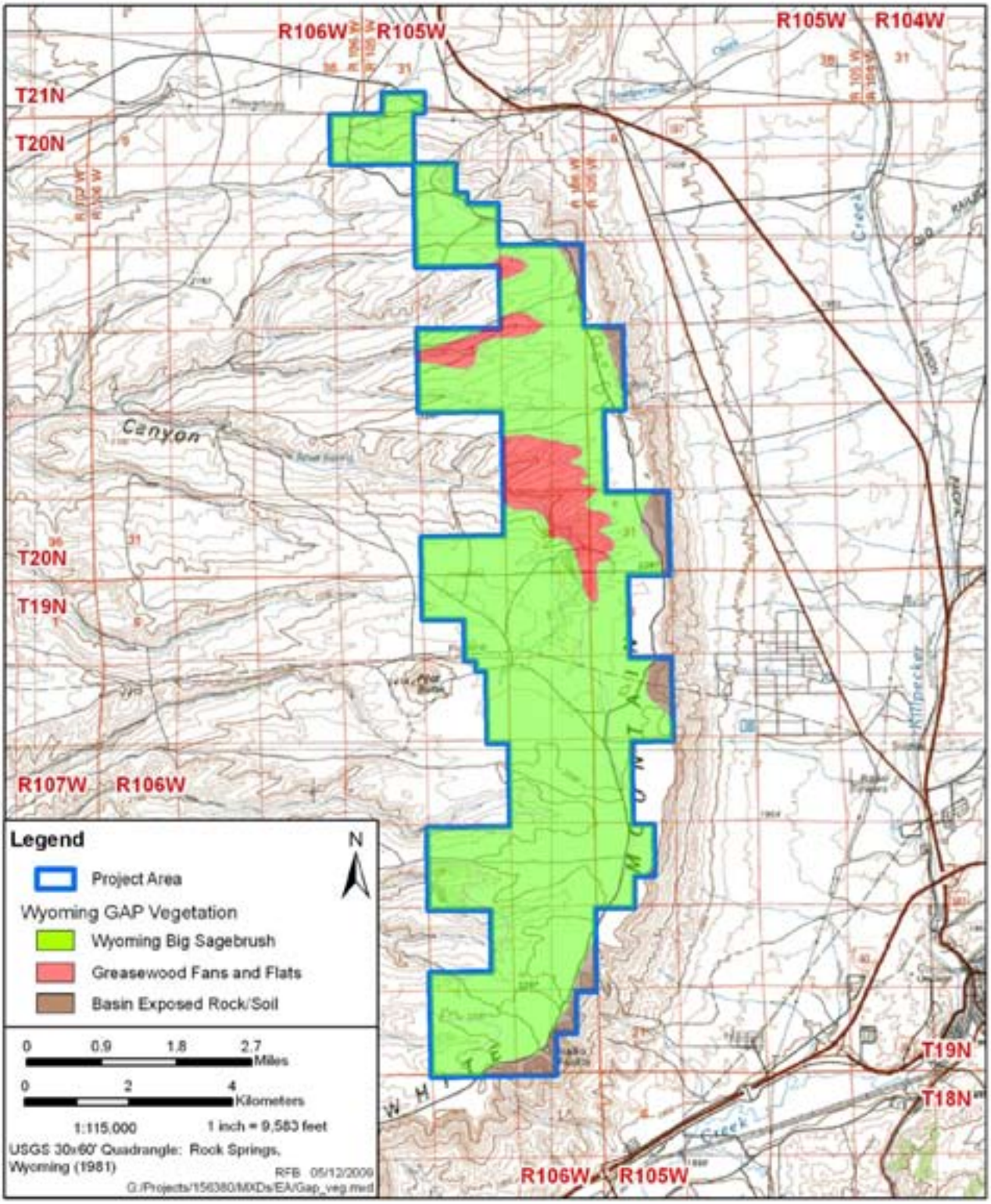

Figure 3.6 Vegetation, WMWE Project.

where snow collects and provides additional moisture to support more mesic species.

No riparian communities are identified by the Wyoming Gap Analysis; however, a review of digital NWI information (USFWS 2003) show the occurrence of a linear palustrine seasonally flooded wetland (PEMC) and two intermittent streams (R4SBA) located in the project area that could potentially support seasonal riparian areas (Figure 3.7). In addition, NWI data indicate the occurrence of several small playa areas (PUSA) (refer to Figure 3.7) scattered within the project area. The Green River Resource Management Plan (BLM 1997) stipulates a 500-ft protection buffer for riparian areas and a 100 ft-buffer for ephemeral channels.

Federal agencies are directed by Executive Order 13112, Invasive Species, to expand and coordinate efforts to prevent the introduction and spread of invasive plant species (noxious weeds) and to minimize the economic, ecological, and human health impacts that invasive species cause. Weed populations are generally found along main dirt roads and two-track roads, in areas of livestock concentration, and in areas of intense recreational use. The BLM says that recent rangeland health monitoring in the RSFO has documented significant increases in invader species throughout the uplands (BLM 2007). Motorized vehicles transporting seeds can be a major source of new infestations of weed species. Noxious weed and other invasive species have not been documented in the project area nor has the Sweetwater Weed and Pest Control sprayed for weeds along County Road 53 in 2008. The closest known area of noxious weeds (*Lepidium latifolium*), hoary cress (*Cardaria* spp.), and Canada thistle (*Cirsium arvense*) occurs along county roads near the Green River located 6.5 mi west of the project area (personal communication, February 5, 2009, with Gale Lamb, Supervisor, Sweetwater County Weed and Pest Control, McKinnon, Wyoming).

3.10 VISUAL RESOURCES

The IAA for visual resources is the project boundary plus a 20-mi buffer. A total of 38,289 acres (3.26%) of the 1,175,515-acre IAA has been disturbed, primarily by cites.

The BLM has initiated visual resource management (VRM) on the lands under its management in the proposed project area, with the overall objective to minimize visual resource impacts resulting from human activities. The VRM inventory process considers the scenic quality of the landscape, viewer sensitivity, and the distance from the viewer to the landscape. VRM relative value of the visual resource is indicated by one of four assigned classes. According to the BLM VRM objectives, areas with VRM Classes I and II are the most valued areas, Class III areas are of moderate value, and Class IV areas are of least value (Table 3.6). VRM Class I and II areas are managed with more restrictions on modification of the existing natural character than are the other VRM classes.

The entire BLM RSFO, including the proposed project area, has been mapped for VRM (BLM 1997). While the project area has been evaluated for VRM classifications, these classifications do not apply to private or state-managed lands. Approximately 85% (11,249 acres) of the proposed project area is within a Class IV VRM area. The remaining 15% (1,916 acres) of the proposed project area--the extreme southeastern portion and the northern portion of the proposed project area--is within an area mapped as a Class III VRM area (Figure 3.8).

The project area is a feature landscape with Pilot Butte as the prominent landform. Feature landscapes are dominated by a feature or a group of feature objects in the distance to which the eye is drawn. Such landscapes are vulnerable to modification if located near the feature. The remainder of the project area consists of gently rolling hills with moderate visual variety in the surrounding landscape. It is a classic panoramic Wyoming landscape that creates a feeling of vastness and open space. It is framed by a backdrop of snow-covered mountains to the northeast and southwest, which enhance the scenic value of the lands in the project area.

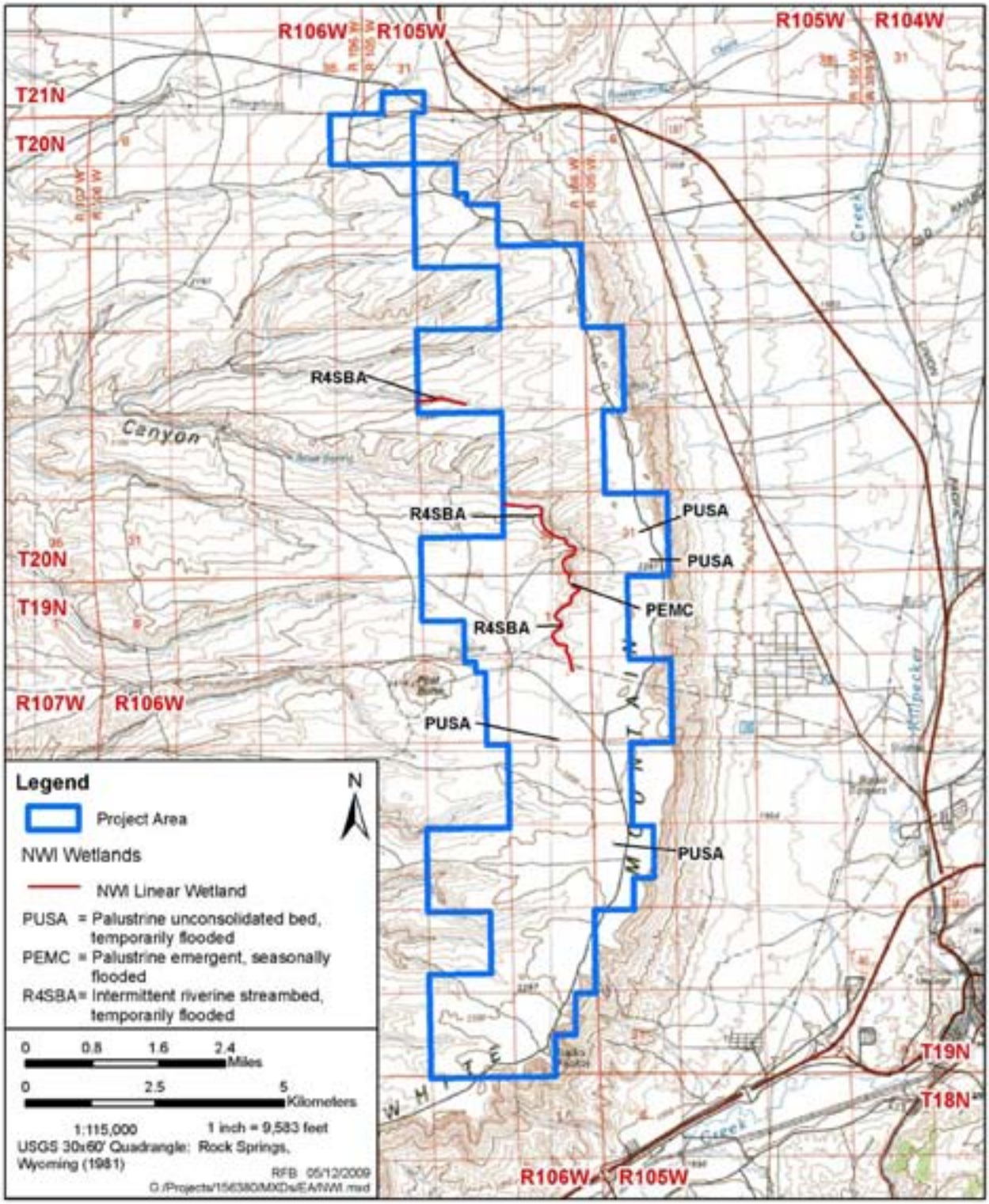

Figure 3.7 National Wetland Inventory Information, WMWE Project.

Table 3.6 BLM Visual Resource Management Class Objectives. [1]

Class	Description
I	The objective of this class is to maintain a landscape setting that appears unaltered by humans. It is applied to wilderness areas, some natural areas, wild portions of the wild scenic rivers, and other similar situations where management activities are to be restricted.
II	The objective of this class is to design proposed alterations so as to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
II	The objective of this class is to design proposed alterations so as to partially retain the existing character of the landscape. Contrasts to the basic elements (form, line, color, and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape. Structures located in the foreground distance zone (0-1/2 mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. This may be especially true when a distinctive architectural motif or style is designed. Approval by the District Manager is required on a case-by-case basis to determine whether the structure(s) meet the acceptable VRM class standards, and if not, whether they add acceptable visual variety to the landscape.
IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape. Structures located in the foreground distance zone (0-1/2 mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. This may be especially true when a distinctive architectural motif or style is designed. Approval by the District Manager is required on a case-by-case basis to determine whether the structure(s) meet the acceptable VRM class standards, and if not, whether they add acceptable visual variety to the landscape.

[1] Source: BLM (1997).

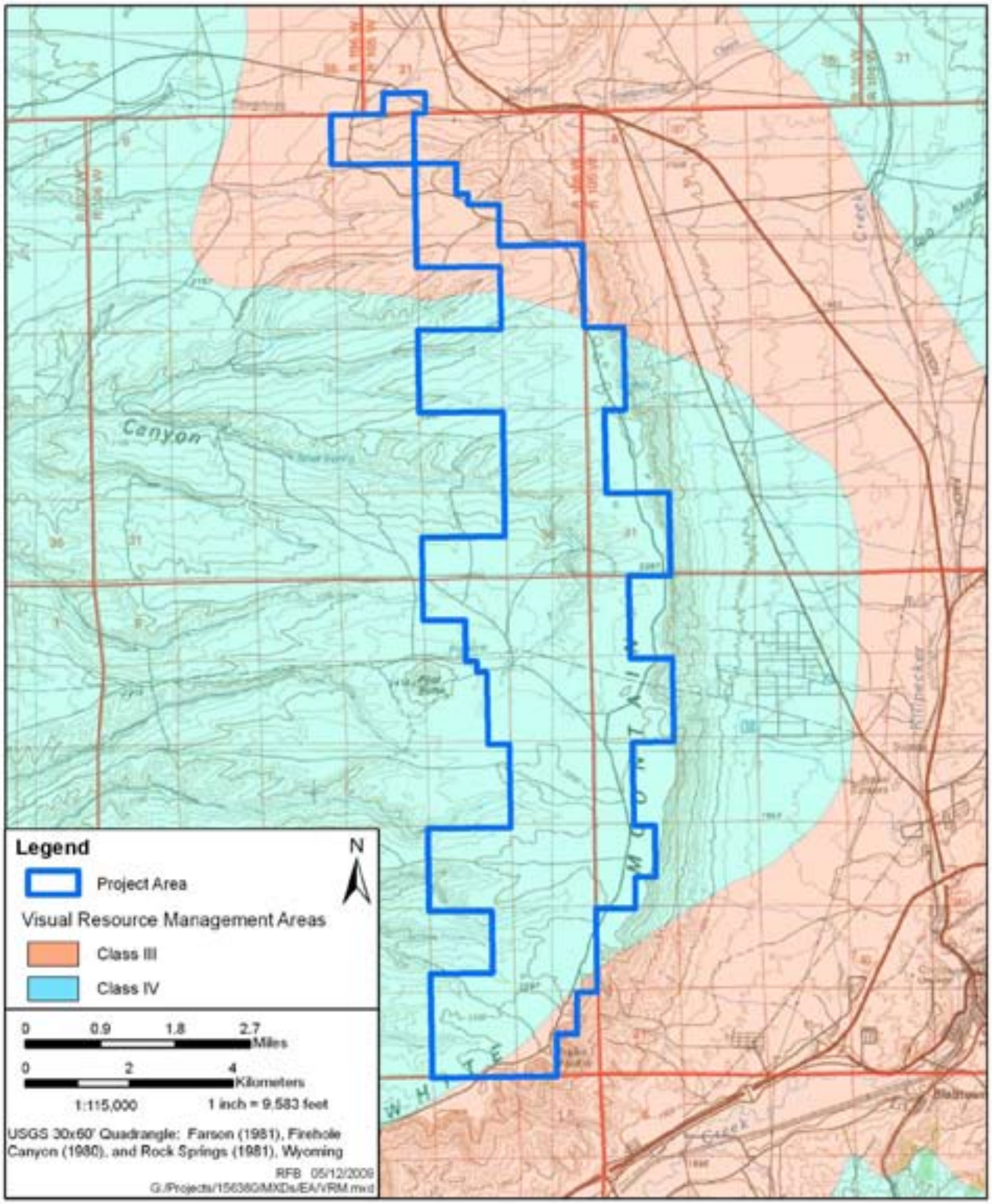

Figure 3.8 Visual Resource Management Areas (Public Lands Only), WMWE Project.

The Pilot Butte feature introduces a strong vertical line in an otherwise horizontal landform. This change in line is what makes the feature landscape most fragile. Apart from the Pilot Butte feature, the lines in the landscape are strongly horizontal in nature. They are formed by the shape of the hills and differences in concentrations of the vegetation.

Vegetation on Pilot Butte is sparse, short, and minimal to nonexistent. Vegetation of the surrounding landscape is predominately sagebrush and short grasses. Sagebrush is by far the dominant vegetative species. For most of the year, the landscape has a strong gray color. There are subtle variations in color resulting from different concentrations, heights, and densities of the vegetation. During the spring and early summer, the sagebrush is a light gray-green color but usually by early August the vegetation matures and takes on a characteristic gray color that is dominant until the following spring.

The texture of the land features of the landscape is mostly smooth with the exception of Pilot Butte, which introduces an extremely coarse point. Texture of the vegetation is coarse in the immediate foreground and medium to smooth at the middle distances.

The area is substantially natural in character with few manmade structures. Within and immediately adjacent to the project area, there are existing gas pipeline and well facilities, three large 345-kV) transmission power lines with metal structures that run east to west through the northern section of the proposed project area, as well as one smaller (230-kV) transmission power line with wooden structures that runs east to west through the center of the project area (and just north of Pilot Butte), a microwave reflecting tower, TV and radio broadcasting towers, two unpaved county roads, and numerous two-track roads/trails.

3.11 WILD HORSES

The IAA for wild horses is the project boundary plus a 6.0-mi buffer. A total of 18,013 acres (9.13%) of the 197,273-acre IAA has been disturbed, primarily by cites.

The proposed project is within the Rock Springs WHHMA, which encompasses approximately 391,409 acres (Figure 3.9).

The White Mountain WHHMA encompasses an area from I-80 north to the Big Sandy River and from U.S. Highway 191 west to the Green River. The estimated population of the White Mountain herd is approximately 306 horses based on direct counts of horses from flights conducted in May 2009 followed by the June 2009 gather. The wild horses in the WHHMA were gathered to the low range Appropriate Management Level (AML) of 215 horses in November 2007 (BLM 2007). The genetic diversity in the White Mountain herd is relatively high as long as herd populations are maintained at a level of greater than 100 animals (BLM 2007).

The AML range for the WHHMA is 215 to 305 wild horses as described in the Green River RMP. In addition, there is a Consent Decree for gathering wild horses above the AML. The range was utilized moderately to heavy by wild horses before they were gathered to the low range AML. Range conditions appear to be static in most areas that are inhabited by wild horses, and the population of wild horses in the herd unit has remained at or above objectives since the institution of wild horse gathering.

3.12 WILDLIFE

3.12.1 Big Game

Three big game species--pronghorn antelope, mule deer, and elk--occur within the proposed project area. The population estimates for big game herds provided below are based on WGFD model estimates from the 2007 big game job completion reports (WGFD 2007).

3.12.1.1 Pronghorn Antelope

The IAA for pronghorn antelope is Hunt Area 96 within the Sublette Herd Unit. A total of 17,409 acres (2.84%) of the 612,496-acre cumulative IAA has been disturbed, primarily by roads and cites.

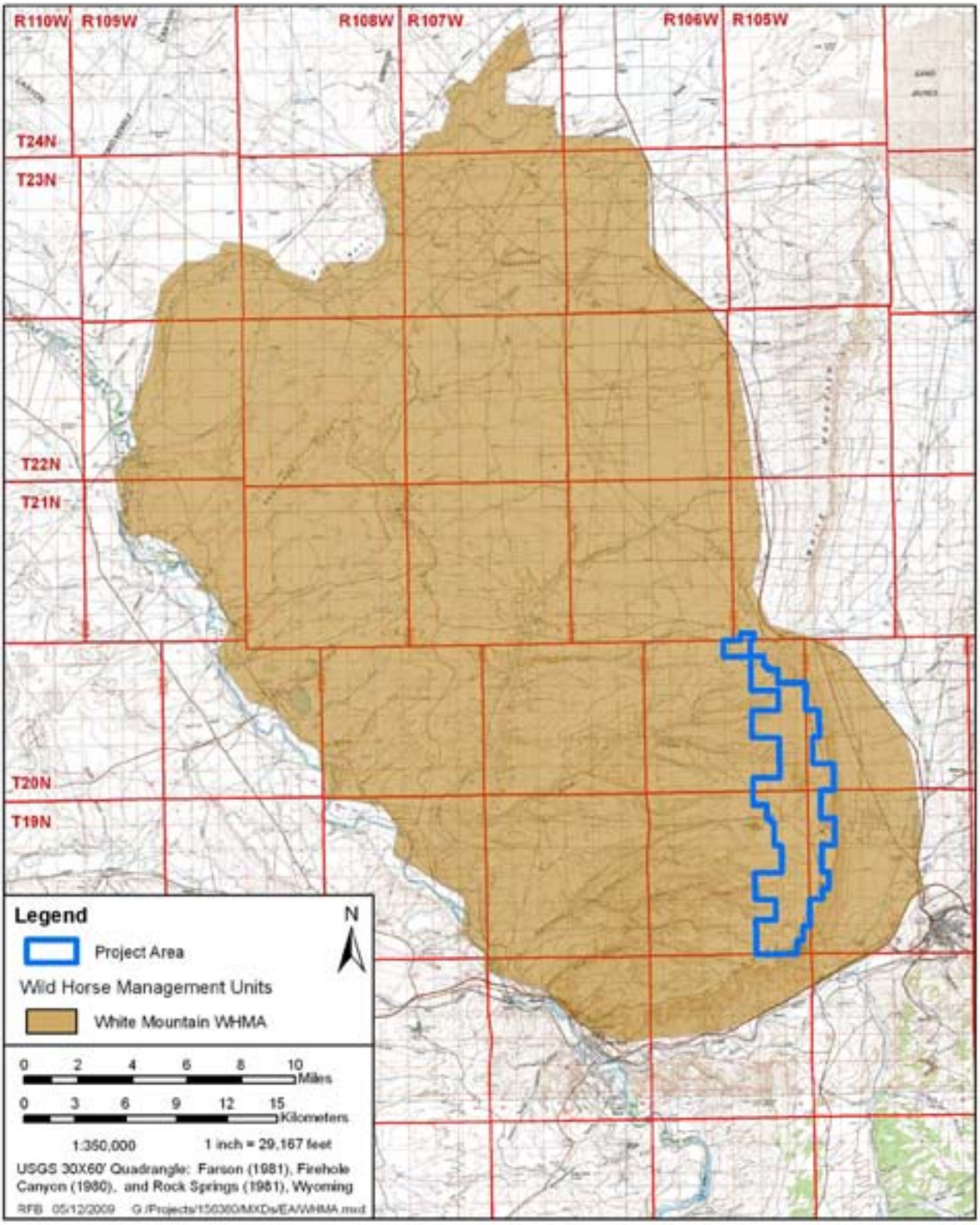

Figure 3.9 Wild Horse Management Areas, WMWE Project.

Pronghorn antelope in the proposed project area belong to the Sublette Pronghorn Antelope Herd (Herd Unit 401, Hunt Area 96). The WGFD population objective for the Sublette Pronghorn Antelope Herd is 48,000 animals, and the 10-year average is 50,210 animals. The 2007 population was estimated at 62,200 animals, approximately 29% above the population objective for this herd (WGFD 2007). Approximately 12,144 acres (92%) of the project area occurs in habitat the WGFD has designated as yearlong habitat, 1,021 acres (8%) of the proposed project area occurs in habitat the WGFD has designated as crucial winter/ yearlong antelope range, which is located near the eastern ridge of the project boundary and the rim of White Mountain (Figure 3.10) (WGFD 2006). The nearest pronghorn antelope severe winter relief habitat is located 4.0 mi southeast of the project area and east of Rock Springs (refer to Figure 3.10). There are no known migration corridors for pronghorn antelope in the WMWE project area. However, there are two corridors north of the WMWE project area (refer to Figure 3.10).

3.12.1.2 Mule Deer

The IAA for mule deer is the Steamboat Herd Unit. A total of 27,191 acres (1.03%) of the 2,554,688-acre IAA has been disturbed, primarily by roads and major facilities.

Mule deer in the proposed project area belong to the Steamboat Mule Deer Herd (Herd Unit 430, Hunt Area 131). The WGFD population objective for the Steamboat Mule Deer Herd is 4,000 animals, and the 10-year average is 4,246 animals. The 2007 population was estimated at 4,540 animals, approximately 13% above the population objective for this herd (WGFD 2007). Approximately 12,028 acres (91%) of the proposed project area occurs in habitat the WGFD has designated as yearlong mule deer range, and 1,029 acres (8%) is designated as winter yearlong. The remaining 108 acres (1%) located in the northwest corner of the project area is designated as "out" under the WGFD habitat designations, meaning that this area is not part of any herd unit; this area does not contain enough animals to be important habitat or the habitats are of limited importance to this species (WGFD 2006) (Figure 3.11). No mule deer crucial winter ranges or parturition areas occur within the proposed project area. The nearest mule deer crucial range is located approximately 11.0 mi south of the proposed project (WGFD 2006).

3.12.1.3 Elk

The IAA for elk is the Steamboat Herd Unit. A total of 23,452 acres (0.93%) of the 2,529,717-acre IAA has been disturbed, primarily by roads and major facilities.

Elk in the proposed project area belong to the Steamboat Elk Herd (Herd Unit 426, Hunt Area 100). The WGFD population objective for the Steamboat Elk Deer Herd is 1,200 animals, and the 10-year average is 1,555 animals. The 2007 population was estimated at 1,300 animals, approximately 8% above the population objective for this herd (WGFD 2007). Approximately 11,559 acres (88%) of the project area occurs in habitat the WGFD has designated as spring/summer/fall habitat, 1,097 acres (8%) of the proposed project area occurs in habitat the WGFD has designated as winter/yearlong elk range (Figure 3.12). Approximately 509 acres (4%) of the western project area intersects the boundary of habitat designated as crucial winter/yearlong range (WGFD 2006) (refer to Figure 3.12). An elk parturition area is located 0.5 to 2.0 mi west of the project boundary.

3.12.2 Small Mammals

Typical predators known to occur or potentially occurring in the proposed project area are coyote, red fox, raccoon, long-tailed weasel, badger, mink, striped skunk, mountain lion, and bobcat. Lagomorph species include desert cottontail, mountain (Nuttall's) cottontail, pygmy rabbit, and white-tailed jackrabbit. Squirrels known to occur or potentially occurring include least chipmunk, Richardson/Wyoming ground squirrel, golden-mantled ground squirrel, and thirteen-lined ground squirrel. Porcupine may also occur. Other rodents include four species of pocket gopher (northern, plains, Merriam's, and Great Basin), two species of pocket mouse (olive-backed and northern),

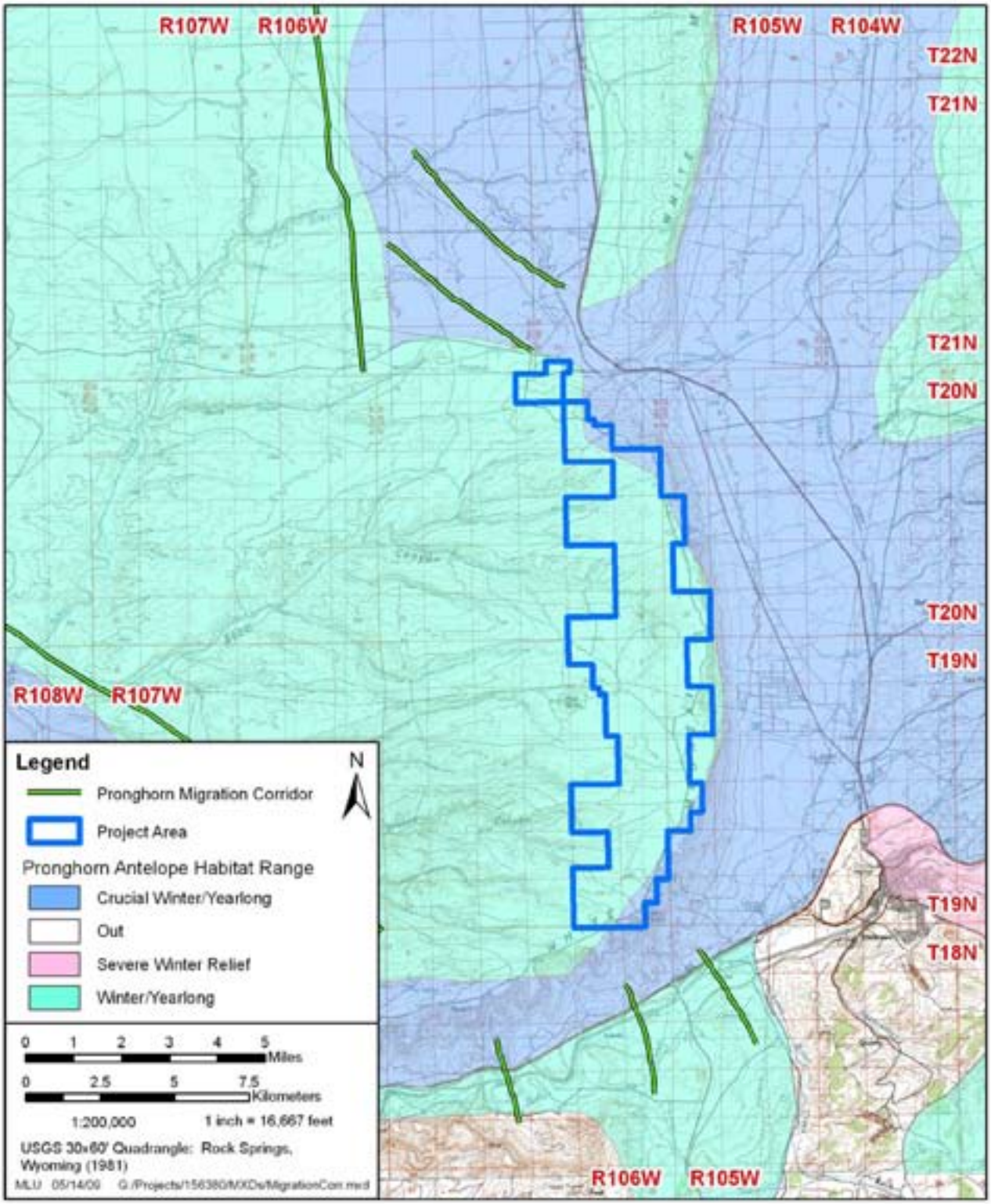

Figure 3.10 Pronghorn Antelope Habitat Ranges, WMWE Project.

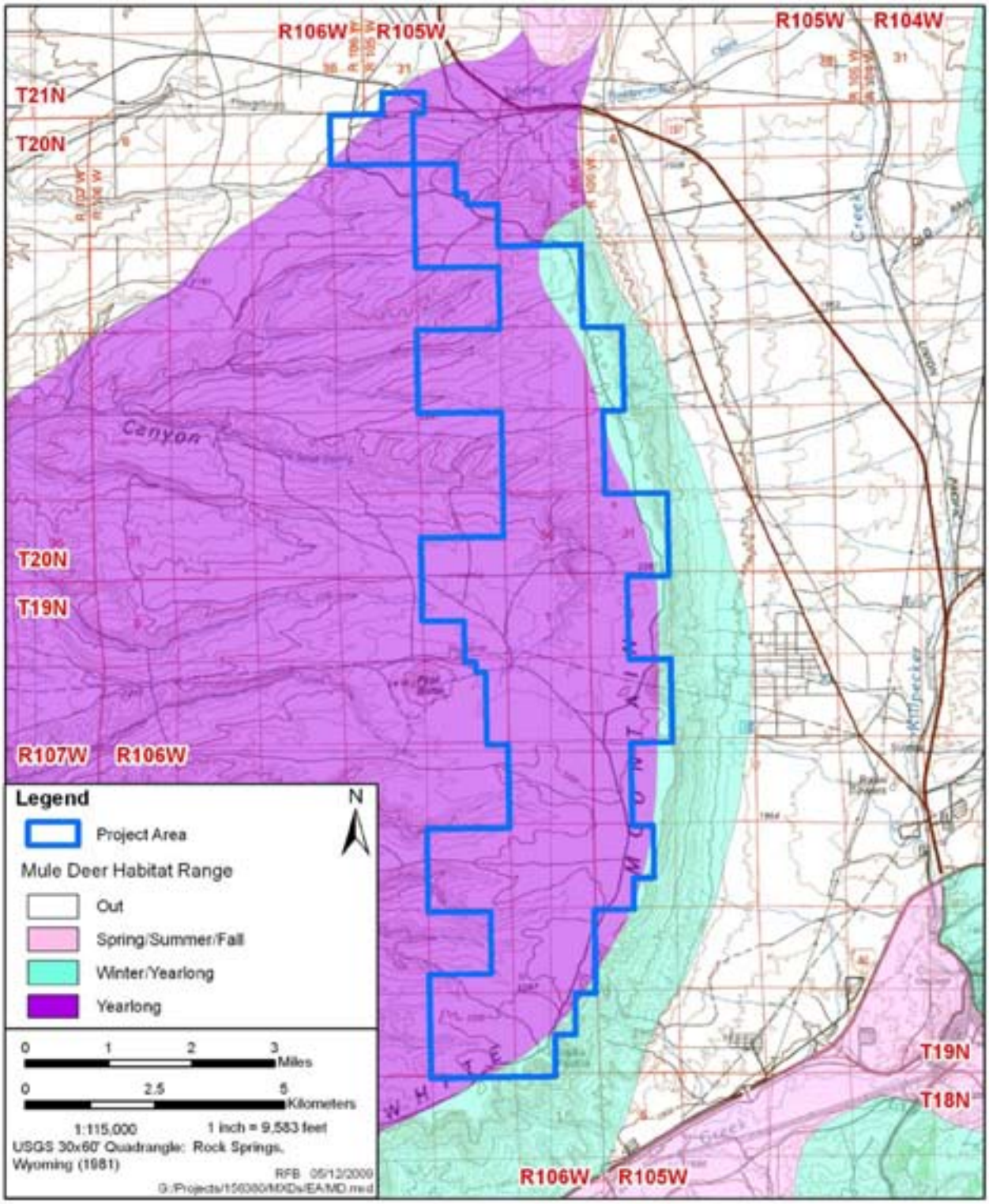

Figure 3.11 Mule Deer Habitat Ranges, WMWE Project.

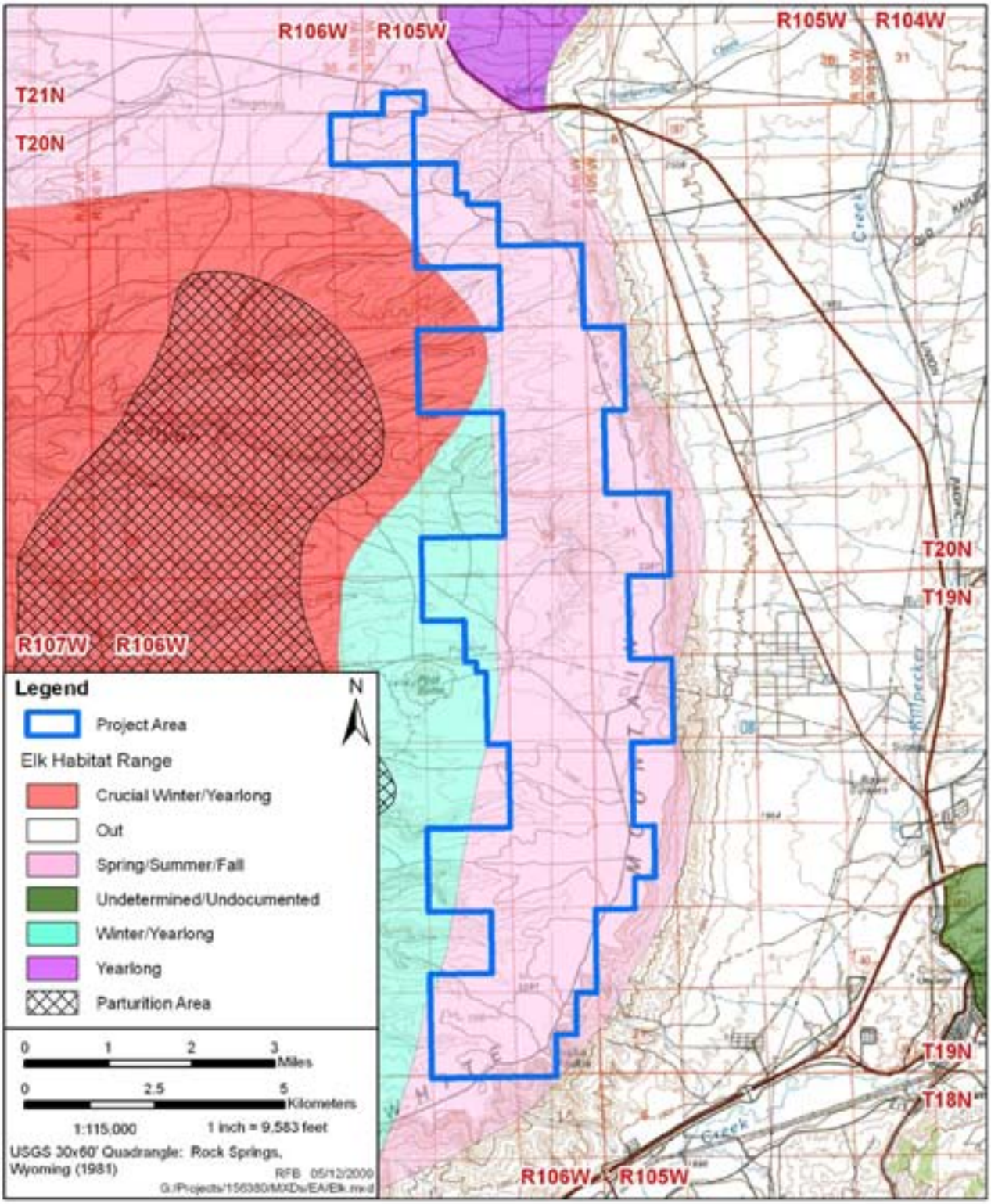

Figure 3.12 Elk Habitat Ranges, WMWE Project.

Ord's kangaroo rat, beaver, deer mouse, northern grasshopper mouse, bushy-tailed woodrat, six species of vole (western, heather, meadow, long-tailed, prairie, and sagebrush), and western jumping mouse (WGFD 2004).

3.12.3 Bats

The IAA for bats is the boundary of the level 12 HUC. A total of 19,954 acres (7.43%) of the 268,613-acre IAA has been disturbed, primarily by cities. Bats species potentially occurring or that may pass through the project area include western small-footed, long-legged, little brown, and silver-haired bats, and the BLM sensitive species long-eared myotis, fringed myotis, spotted bat, and Townsend's big-eared bat (WGFD 2004). An acoustical bat monitoring survey was conducted during late summer and early fall of 2008 within the proposed WMWE project area (TRC 2008d). The purpose of the acoustical bat monitoring study was to document bat migration in the project area and to provide baseline data that can be used to evaluate potential impacts to bats due to wind energy development in the project area. Species documented in the project area included hoary, silver-haired, and big brown bats; however, other species of bats with high-frequency calls (i.e., greater than 35 kilohertz [kHz]) that may occur are listed in Table 3.7 (TRC 2008d).

There are no known winter hibernacula, diurnal roosting sites, or other features that are likely to attract bats located within or immediately adjacent to the proposed WMWE project area (TRC 2008d). In addition, surveys were conducted near the project area, and no winter hibernacula, diurnal roosting sites, or other features that are likely to attract bats are located within or immediately adjacent to the proposed WMWE project area (TRC 2008d). In addition, the WMWE project area does not contain topographic features likely to funnel migrating bats, and the project area lacks large tracts of forest cover, unlike high-mortality sites in the eastern U.S. However, the relatively large numbers of bat fatalities recently reported in northern Iowa (Jain 2005) and southwestern Alberta (Baerwald 2006) indicate that an open landscape is no guarantee of low mortality. Based on the topography and habitats of the WMWE project area, it is expected that a majority of bat mortalities associated with operation of the wind energy facility would occur as individuals migrate through the area.

Table 3.7 Bat Species Determined from Range Maps as Likely to Occur Within the WMWE Project Area, Sorted by Call Frequency.[1]

Bat Species with High-frequency Calls (≥35 kHz)		Bat Species with Low-frequency Calls (<35 kHz)	
Common Name	Scientific Name	Common Name	Scientific Name
Western small-footed bat	*Myotis ciliolabrum*	Townsend's big-eared bat	*Corynorhinus townsendii*
Western long-eared bat	*Myotis evotis*	Silver-haired bat [2, 3]	*Lasionycteris noctivagans*
Little brown bat	*Myotis lucifugus*	Hoary bat [2, 3]	*Lasiurus cinereus*
Long-legged bat	*Myotis volans*	Fringed bat	*Myotis thysanodes*
		Big brown bat [3]	*Eptesicus fuscus*

1 From Harvey et al. (1999) and Bat Conservation International, Inc. (2002).
2 Long-distance migrant.
3 Species documented in fatality studies at other U.S. wind energy facilities.

3.12.4 Raptors

The IAA for raptors is the project area plus a 14.5-mi buffer. A total of 29,676 acres (4.28%) of the 693,604-acre IAA has been directly disturbed, primarily by the cities of Rock Springs, Green River, and surrounding developments.

Raptor species most likely to occur or potentially occurring within the WMWE project area and immediate vicinity include (based on habitat preferences) golden eagle; northern harrier; Swainson's, red-tailed, ferruginous, and rough-legged hawks; American kestrel; prairie falcon; and great horned, burrowing, and short-eared owls. However, osprey; bald eagle; sharp-shinned and Cooper's hawks; northern goshawk; merlin; and barn, long-eared, and northern saw-whet owls also occur within the project area latilong and may occasionally pass through the project area (WGFD 2004).

In conjunction with the WMWE Project, a raptor nest survey was conducted within a 213-mi^2 survey area that includes the project area and surrounding vicinity, particularly to the west and south (TRC 2008c). The survey was conducted by helicopter between April 24 and 26, 2008. During the survey, 245 raptor and corvid nests were recorded, including 10 American kestrel, 27 common raven, 19 ferruginous hawk, 67 golden eagle, three great horned owl, 18 prairie falcon, 18 red-tailed hawk, and 83 nests of unidentified species, most of which likely were golden eagle or red-tailed hawk nests. Fifty (20%) of the nests were occupied in 2008, and an additional seven nests were recorded as having an unidentified activity status (TRC 2008c). Figure 3.13 illustrates the general locations of the 2008 active raptor nests and the season buffers for each nest.

The project area and surrounding vicinity provide suitable foraging habitat for the raptor species nesting in the area, as well as for migrants that may pass through. In addition, bald eagles and rough-legged hawks may winter in and/or adjacent to the area, with small mammals and road- or winter-killed big game providing a food source for those species, as well as resident raptor species.

3.12.5 Upland Game Birds

The IAA for upland game birds is the area north of Bitter Creek, east of the Green River, south of the Big Sandy River to Farson, then east to Killpecker Sand. A total of 10,401 (1.91%) of the 545,351-acre IAA has been disturbed, primarily by roads.

The WMWE project area is located entirely within the Eden UGBMA #7, and the Flaming Gorge UGBMA #6 extends to within approximately 1.0 mi of the southeastern corner of the project area (WGFD 2009) (refer to Figure 3.4). WGFD (2004) lists chukar and BLM sensitive species (refer to Figure 3.4) blue grouse, mourning dove, and greater sage-grouse as breeding within the WMWE project area latilong, and gray partridge and ruffed grouse are listed as occasional visitors within the latilong. However, based on the habitat preferences of these species, only chukar, greater sage-grouse, and mourning dove were close and within the project area in 2008 (TRC 2009b).

Chukar was observed in the rocky shrublands west of the project area during raptor nesting surveys conducted for this project (TRC 2008c, 2009b). Although their presence in the project area is likely to be infrequent based on their preferred habitat of rocky shrublands and foothills, chukar may frequent areas to the west and may occasionally fly through the project area.

Mourning doves are found in a wide variety of habitats ranging from urban and disturbed areas to deserts (near water), agricultural areas, and open woodlands (Erlich et al. 1988). They are summer residents in Wyoming and are considered abundant throughout the state (WGFD 2004). During spring and fall point count surveys conducted in conjunction with this project, only two mourning doves were observed; however, the species is common in the general area and are known to occur within or adjacent to the project area (TRC 2009b).

Greater sage-grouse is a BLM sensitive species and is discussed in Section 3.8.2.

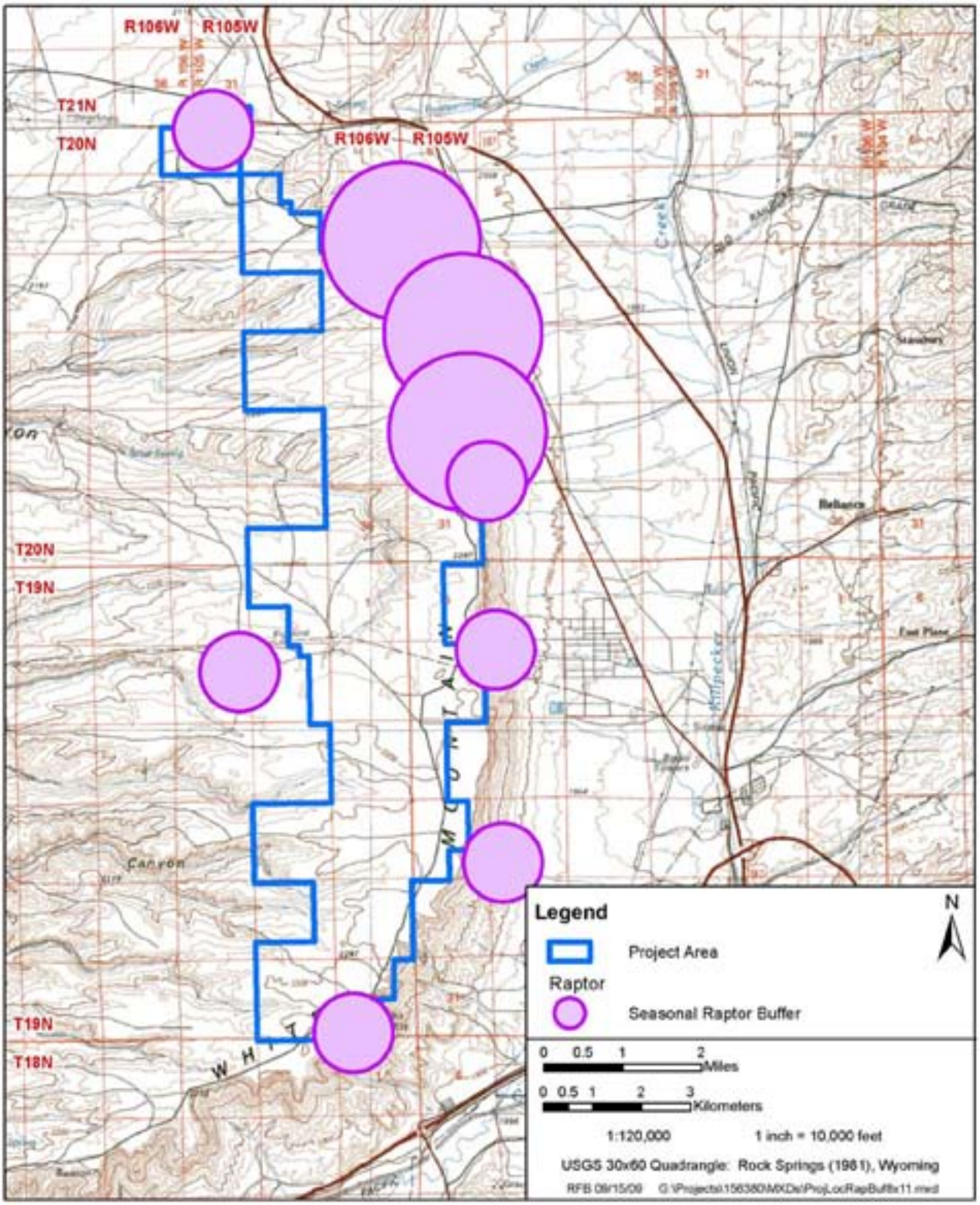

Figure 3.13 General Location of 2008 Active Raptor Nests and Seasonal Buffers.

3.12.6 Migratory Birds

The IAA for migratory birds is the boundary of the level 12 HUC. A total of 19,954 acres (7.43%) of the 268,613-acre IAA has been disturbed, primarily by cities.

During the spring and fall of 2008, avian point count and use surveys of the WMWE project area were conducted in conjunction with the proposed project. Avian surveys were conducted 2 days each week for 10 weeks during the spring survey period (April 14 through June 17, 2008) and for 11 weeks during the fall survey period (August 17 through October 27, 2008). Nine survey plots for RLB and 18 survey plots for PSB were established in the WMWE project area. Flight heights of each species were recorded at each of the avian survey plots. Nocturnal observation surveys were conducted at seven of the nine RLB point count plots. The nocturnal surveys were conducted once a week from May 6, 2008, through June 16, 2008, during spring surveys and from August 17, 2008, through October 26, 2008, during the fall surveys. A comprehensive description of survey methods and results can be found in TRC (2009b). Table 3.8 provides a list of all bird species observed during those studies and their likely occurrence classification within the latilong. Although the list is not comprehensive for all birds that might use or fly through the vicinity, it is indicative of the species that most likely and commonly occur in the project area. Since there are no permanent water bodies within the project area, it is unlikely that waterfowl and shorebirds typically would nest in the area, although birds nesting along the Green River to the east, as well as migrating birds, may occasionally pass through the area. Avian diversity for the WMWE project area was slightly higher during the fall than spring (at least 14 species vs. 12 species). Equal numbers of PSB species were recorded in the WMWE project area for spring and fall (30 species each season). Horned lark was the most abundant of the species documented in the WMWE project area during both spring and fall. PSB use in the project area for all birds combined in the spring averaged 250.65 birds/km^2/8-minute observation period compared to 123.67 in the fall (TRC 2009b). Use for both seasons combined was 182.49 birds/km^2/8-minute observation period.

Based on the 2008 avian daytime surveys, the project area did not appear to serve as a migratory corridor for birds, and the paucity of birds heard and observed during the nocturnal surveys may indicate a relatively low risk posed to night-migrating birds that may fly over the project area; however, in the absence of calling, small birds flying would have been difficult to detect during the nocturnal surveys given their small size and the limitations of the equipment used. The project area did not appear to serve as a major migratory stopover site. During spring, the highest numbers of birds were recorded in May with the peak survey occurring during the week of May 13. During the fall surveys, the highest number of birds occurred during the first week of surveys (August 18), and both the numbers of individuals and the numbers of species dropped notably thereafter. This suggests that many of the migrants may have moved out of the area before or concurrent with the initiation of the fall surveys in mid-August. All migratory birds are protected by the *Migratory Bird Treaty Act* (16 U.S.C. 701-715).

Table 3.8 Avian Species Recorded Within the WMWE Project Area and Vicinity During 2008 Project-related Studies.

Common Name	Scientific Name	Dorn and Dorn (1999) Classification[1]	WGFD (2004) Classification[2]
Chukar	*Alectoris chukar*	R	B
Double-crested cormorant	*Phalacrocorax auritus*	Y	B
Turkey vulture	*Cathartes aura*	b	B
Canada goose	*Branta canadensis*	R	B
Northern harrier	*Cyrcus cyaneus*	R	B
Red-tailed hawk	*Buteo jamaicensis*	R	B
Ferruginous hawk	*Buteo regalis*	B	B
Rough-legged hawk	*Buteo lagopus*	W	O
Golden eagle	*Aquila chrysetos*	r	B
American kestrel	*Falco sparverius*	R	B
Merlin	*Falco columbarius*	R	B
Prairie falcon	*Falco mexicanus*	B	B
Greater sage-grouse	*Centrocercus urophaisianus*	B	B
Mourning dove	*Zenaida macroura*	B	B
Great horned owl	*Bubo virginianus*	r	B
Common nighthawk	*Chordeiles minor*	b	B
Common poorwill	*Phalaenoptilus nuttallii*	b	B
Broad-tailed hummingbird	*Selasphorus platycercus*	b	b
Northern flicker	*Colaptes auratus*	R	B
Olive-sided flycatcher	*Contopus cooperi*	b	b
Western wood-pewee	*Contopus sordidulus*	b	B
Least flycatcher	*Empidonax minimus*	--	--
Say's phoebe	*Sayornis saya*	B	B
Loggerhead shrike	*Lanius ludovicianus*	b	B
Black-billed magpie	*Pica pica*	R	B
Common raven	*Corvus corax*	r	b
Horned lark	*Eremophila alpestris*	R	B
Tree swallow	*Tachycineta bicolor*	B	B
Cliff swallow	*Petrochelidon pyrrhonota*	B	B
Mountain chickadee	*Poecile gambeli*	R	B
Red-breasted nuthatch	*Sitta canadensis*	B	b
Rock wren	*Salpinctes obsoletus*	b	B
Bewick's wren	*Thryomanes bewickii*	B	B
House wren	*Troglodytes aedon*	B	B
Ruby-crowned kinglet	*Regulus calendula*	B	b
Blue-gray gnatcatcher	*Polioptila caerulea*	B	B

Table 3.8 (Continued)

Common Name	Scientific Name	Dorn and Dorn (1999) Classification[1]	WGFD (2004) Classification[2]
Mountain bluebird	*Sialia currucoides*	B	B
Townsend's solitaire	*Myadestes townsendi*	W	b
Hermit thrush	*Catharus guttatus*	b	B
American robin	*Turdus migratorius*	R	B
Sage thrasher	*Oreoscoptes montanus*	b	B
Virginia's warbler	*Vermivora virginiae*	b	B*
Yellow-rumped warbler (Audubon's)	*Dendroica coronata auduboni*	b	B
Common yellowthroat	*Geothlypis trichas*	b	b
Western tanager	*Piranga ludoviciana*	b	b
Green-tailed towhee	*Pipilo chlorurus*	B	B
Chipping sparrow	*Spizella passerina*	B	B
Brewer's sparrow	*Spizella breweri*	B	B
Vesper sparrow	*Pooecetes gramineus*	b	B
Sage sparrow	*Amphispiza belli*	B	B
Grasshopper sparrow	*Ammodramus savannarum*	b	b
Fox sparrow	*Passerella iliaca*	B	B
Song sparrow	*Melospiza melodia*	r	B
Dark-eyed junco (slate-colored)	*Junco hyemalis hyemalis*	M	B
Dark-eyed junco (gray-headed)	*Junco hyemalis caniceps*	B	B
Western meadowlark	*Sturnella neglecta*	B	B
Brewer's blackbird	*Euphagus cyanocephalus*	b	B
Brown-headed cowbird	*Molothrus ater*	b	B

[1] Based on Dorn and Dorn (1999) classifications for the project area latilong. R = observed in summer and winter, breeding confirmed; r = observed in summer and winter, breeding suspected but unconfirmed; B = observed in summer, breeding confirmed; b = observed in summer, breeding suspected but unconfirmed; Y = observed in winter and summer, probably nonbreeding; W = observed in winter; m = observed in migration season; -- = no classification.

[2] Based on WGFD (2004) classifications for the project area latilong. B = nest or young dependent on parent birds was observed; b = circumstantial evidence of nesting; * = record has been reviewed and accepted by the Wyoming Bird Records Committee; O = the species has been observed, but there was no evidence of nesting. The observation may have been recorded during any season of the year, but observations are most likely to correspond with seasonal status listed in Table 1 of WGFD (2004).