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3.6 Ecology

The Permit Area is located in the Wyoming Basin ecoregion (Chapman, 2004) at an elevation of approximately 7,000 ft amsl. With approximately 260 feet of relief, sub-zero winter temperatures, and less than ten inches of annual precipitation, vegetation development and species diversity are limited.

The information in this section is based on field surveys conducted in 2006 and 2007 as well as on existing reports and databases of state and federal agencies. The abundance, habitat requirements, seasonal fluctuations, and distribution of species were evaluated. Species of particular interest included:

- threatened or endangered species, and Migratory Birds of High Federal Interest (MBHFI);
- commercially or recreationally valuable species;
- species affecting the well-being of species of special concern;
- species critical to the structure and function of the ecological system; and
- biological indicator species of radionuclides or chemical pollutants in the environment.

Appropriate state and federal agencies, including WDEQ, WGFD, BLM, US Fish and Wildlife Service (FWS), were consulted on the scope of work for the proposed ecological surveys and presence or absence of species of special concern.

3.6.1 Vegetation

Within the Permit Area, two vegetation types, dominated by big sagebrush, were identified and mapped (**Figure 3.6-1**). The Upland Big Sagebrush Shrubland type dominates the flat upland areas and the gentle slopes (**Figure 3.6-2**). The Lowland Big Sagebrush Shrubland type occurs in deeper soils along the gently sloped, south-facing ephemeral dry washes (**Figure 3.6-3**).

During the 2006 growing season, a vegetation survey was conducted within the area originally planned for the Permit Area. Prior to commencing field work in 2006, WDEQ reviewed and accepted the study design (Moxley, M. Lander Field Office Supervisor, WDEQ-LQD Lander Field Office. Personal communication. June 2006).

Once the vegetation types were identified and delineated, each of the types was sampled with 20 transects (a total of 40 transects) using a point-intercept approach to obtain vegetation cover and species diversity data. Vegetation cover observations were made on a species basis. Observations were also made for cover by litter and bare soil.

Observations on species diversity were obtained by recording all the species that occurred along and within 3.3 feet (one meter) of each 82-foot (25-meter)-long transect. The two vegetation types are fairly homogeneous, but the overall species diversity is relatively low (58 species were observed and are presented in **Table 3.6-1**). The absence of perennial streams, minimal topographic variation, and limited annual precipitation tend to restrict the overall species diversity. In general, the vegetation of the Permit Area is typical and representative of most of the region.

The planned Permit Area was expanded in early 2007, and the vegetation survey was extended to include the Permit Area expansion during the 2007 growing season. Field work for 2007 consisted of preparing and field checking a vegetation map of the Permit Area expansion. Since the vegetation types that occurred in the Permit Area expansion were the same as those in the original Permit Area, no additional sampling was conducted. This approach was deemed to be acceptable to WDEQ (Moxley, M. Lander Field Office Supervisor, WDEQ-LQD Lander Field Office. Personal communication. April 2007).

In the section that follows, each of the vegetation types is described based on data collected in June 2006 and on general observations made during various site visits in 2006 and 2007.

3.6.1.1 Upland Big Sagebrush Shrubland

The Upland Big Sagebrush Shrubland type covers most of the Permit Area (approximately 85 percent of the total Permit Area). It covers flat areas and the gently sloping south-facing slopes, and its development is not affected by the gentle topography that characterizes the Permit Area. The percent slope of this type ranges from zero to six percent. Soils throughout the upland areas are mostly shallow and coarse textured. The only environmental settings in the Permit Area that do not support the Upland Big Sagebrush Shrubland type are the areas along the drainages where the Lowland Big Sagebrush Shrubland type grows in the deeper soils that characterize the bottomland areas.

The major species in this type is big sagebrush, which occurs at a mean absolute cover of 14 percent, and accounts for 54 percent of the cover by all species. Sandberg bluegrass *(Poa secunda)*, needle-and-thread grass *(Stipa comata)*, Indian ricegrass *(Oryzopsis hymenoides)*, and thickspike wheatgrass *(Agropyron dasystachyum)* occur as the most prevalent perennial grass species. Together, these four species had a mean cover of eight percent and accounted for 31 percent of the cover by all species. Cushion plants are common in this vegetation type, but collectively accounted for only six percent of the cover by all species. Even though the mean cover values for these species are low, they

were commonly encountered along all the sample transects. The mean total vegetation cover in this type was 26 percent, the cover by litter and rock combined was 22 percent, the bare soil cover was 52 percent, and the total ground cover (vegetation plus litter and rock) was 48 percent. The percent cover by bare soil is a reflection of the sparseness of the vegetation in the Upland Big Sagebrush Shrubland type. Even though there is a considerable amount of bare soil, the vegetation development is very homogeneous across the upland parts of the Permit Area. In general, vegetation development in the region is restricted because of the limited amount of annual precipitation.

Shrubs are abundant in this vegetation type. Big sagebrush occurred at a density of 12,332 individuals per acre (about three per square meter) and rabbitbrush *(Chrysothamnus viscidiflorus)* occurred at a density of 1,490 individuals per acre (0.4 per square meter). While these shrub species occur at high densities, none of the plants are tall. In general, most of the plants are less than 20 inches (0.5 meters) in height and many are less than ten inches (25 centimeters) in height. Semi-shrubs are also common in these upland areas. The total density for semi-shrub species was 2,583 individuals per acre (0.64 per square meter) with winterfat *(Ceratoides lanata)* and prickly gilia *(Leptodactylon pungens)* occurring as the most prevalent of the semi-shrub species.

In all, 36 species were observed in this type (**Table 3.6-1**), with a mean density of about 2.8 species per 100 square feet (about 15 species per 50 square meters).

3.6.1.2 Lowland Big Sagebrush Shrubland

The Lowland Big Sagebrush Shrubland type of the Permit Area occurs along and immediately adjacent to the ephemeral drainages that cross the Permit Area from north to south. Overall, this type covers approximately 15 percent of the total Permit Area. The soils along the drainages tend to be deeper than those on the adjacent uplands and, thereby, have the potential for holding more moisture than the upland areas. The increased potential soil moisture allows for more growth by big sagebrush, so that the individual shrubs growing along the drainages tend to be much larger than the shrubs growing on the upland areas. Along some of the drainages, there are individual big sagebrush plants that are more than 6.6 feet (two meters) tall and have stem diameters greater than 8 inches (20 centimeters). The slope measurements along the sampled transects in this type ranged between zero and three percent; all the transects were either flat or had a southerly aspect component.

The major species in this type is big sagebrush, which occurred at a mean cover of 31 percent and accounted for 72 percent of the cover by all species. Rabbitbrush had a mean cover of three percent and accounted for eight percent of the total vegetation cover. These two dominant shrub species tend to overwhelm the vegetation to the degree that

herbaceous species account for only limited amounts of cover in this type. All native perennial grasses combined had a mean cover of seven percent (16 percent of the total vegetation cover) with Sandberg bluegrass *(Poa secunda)*, thickspike wheatgrass *(Agropyron dasystachyum)*, and squirreltail grass *(Sitanion longifolium)* occurring as the most prevalent perennial grass species. Forb species occur throughout this type, but all occurred at mean cover values that were less than one percent. As a group, all forbs and cushion plants accounted for approximately three percent of the total vegetation cover. The mean total vegetation cover in this type was 43 percent, the cover by litter and rock combined was 34 percent, the bare soil cover was 23 percent, and the total ground cover (vegetation plus litter and rock) was 77 percent. Overall, the vegetation cover in the Lowland Big Sagebrush Shrubland type was 17 percent greater than the cover in the Upland Big Sagebrush Shrubland type.

Shrubs are abundant in this vegetation type. Big sagebrush occurred at a density of 14,417 individuals per acre (3.6 per square meter), and rabbitbrush *(Chrysothamnus viscidiflorus)* occurred at a density of 2,591 individuals per acre (0.6 per square meter). Semi-shrubs occur in this type, but the overall densities are lower than the densities for semi-shrubs in the upland areas. The total density for semi-shrub species was 235 individuals per acre (0.1 per square meter), with prickly gilia *(Leptodactylon pungens)* occurring as the most common of the semi-shrub species.

In all, 43 species were observed in this type (**Table 3.6-1**) with a mean density of about 2.4 species per 100 square feet (12.8 species per 50 square meters).

3.6.1.3 Threatened, Endangered and Special Concern Plant Species

As defined by WDEQ-Land Quality Division (LQD) Guideline No. 2, a literature review was conducted to identify species of special concern, prohibited and restricted noxious weeds, and selenium indicators that could be present within the Permit Area. The review identified several species that occur within the general region.

Threatened and endangered species of the region include the blowout penstemon (*Penstemon haydenii*) and the desert yellowhead (*Yermo xanthocephalus*). Descriptions of these species are provided below.

- Blowout penstemon: This is the only endangered plant species in Wyoming and is known from an area south of the Ferris Mountains, in northwestern Carbon County (Fertig, 2000). While the species is known to occur on a site approximately 32 miles east-northeast of the Permit Area, it is unlikely to occur in the Permit Area. Blowout penstemon grows exclusively in sand blowout

areas, a habitat type absent in the Permit Area. The site south of the Ferris Mountains is the only known location for the species in Wyoming. The only other known populations of blowout penstemon occur in similar sand blowout habitats in northwestern Nebraska.

- Desert yellowhead: This is a threatened species in Wyoming, occurring in southern Fremont County in the Beaver Rim Area, approximately 45 miles northwest of the Permit Area. This species was first discovered in 1990. Its only known population occurs in the Beaver Rim Area. The species appears to be restricted to surface outcrops of Miocene ash deposits. The known populations occur in an area of approximately 42 acres; however, plants occur on only approximately eight acres within the overall distribution area. Studies conducted subsequent to the 1990 discovery have not identified any other localities of the species (Heidel, 2002).

An additional 12 rare plant species are known to occur in Sweetwater County (**Table 3.6-2**). During the vegetation surveys, special consideration was given to these species of special concern and micro-environments capable of supporting these species. However, no species of special concern were observed within the Permit Area.

3.6.1.4 Weeds and Selenium Indicator Species

Overall, the Permit Area has very few weeds due to the remoteness of the site and the limited amount of past disturbance, other than two-track roads and drill sites (**Section 3.3.3**) that has occurred in the area. A list of the prohibited and restricted weeds is provided in **Table 3.6-3**. Only one listed restricted noxious weed species, tansy mustard, was observed within the Permit Area. Scattered individuals of tansy mustard *(Descurainia pinnata)* were observed in the Lowland Big Sagebrush Shrubland. No areas dominated by weedy species were observed within the Permit Area. Selenium indicator species were not observed on-site, and none of the soils of the Permit Area are considered seleniferous.

3.6.2 Aquatic Life and Wetlands

After conducting field investigations and research, aquatic life and wetlands were determined to not exist within the boundaries of the Permit Area. Surface water may be present seasonally, but does not sustain aquatic life or wetland species.

3.6.3 Wildlife

Wildlife inventories of the Permit Area were conducted in 2006 and 2007. Wildlife inventories were designed to provide baseline data for permitting the ISR Project and to ensure that wildlife species and habitats are afforded adequate protection during construction, operations, and restoration. Data collection included file searches of state and federal agency documents, and field surveys for raptors, sage grouse, and breeding birds. Wildlife studies focused on threatened and endangered (T&E) species, MBHFI, raptors, sage grouse leks and nesting habitat, breeding bird surveys, and Pygmy rabbits, as well as a general wildlife inventory of the Permit Area.

For most surveys, the study area was the same as the Permit Area. In order to identify the off-site habitat and individuals that could be affected by Project activities, the study area for sage grouse included an additional two-mile perimeter, and the study area for raptors included an additional one-mile perimeter. Land ownership of the study area is under the jurisdiction of BLM and the State of Wyoming.

The dominant vegetation type within the Permit Area is big sagebrush. The elevation ranges from 6,790 feet to 7,050 feet. The topography is characterized by rolling plains with small, ephemeral drainages dissecting the area. There are no perennial water sources within the study area. Crook Well Reservoir, a stock pond located in Section 16 of Township 25 North, Range 92 West, was dry during the 2006 field survey and contained a small amount of water during the spring of 2007. The entire Permit Area covers approximately 4,220 acres.

The field surveys and reports specific to the Project were completed by Eric Berg, Cecily Mui, Ray Fetherman, Troy Gerhardt, Dennis Buechler, and Eric Fetherman, who are all qualified wildlife biologists or ecologists. Personnel contacted from WGFD include Greg Hiatt (2006, 2007) and Reg Rothwell (2006). Mary Jennings with FWS was also contacted. The interviewed BLM personnel were Rhen Etzelmiller (2006, 2007) and Frank Blomquist (2006). Regular Project briefings were held during the baseline surveys, and BLM and WDEQ-LQD staffs were updated with the progress of the wildlife surveys.

3.6.3.1 Wildlife Habitat Description

The wildlife habitat in the Permit Area is predominantly big sagebrush shrublands (**Figure 3.6-1**). Other wildlife habitats include cushion plant communities, small isolated patches of grassland, and disturbed lands. The big sagebrush shrublands were divided into two different types: Upland Big Sagebrush Shrubland and Lowland Big Sagebrush Shrubland.

The Upland Big Sagebrush Shrubland wildlife habitat (**Figure 3.6-2**) is generally found on flat and rolling hills. This habitat is important for pronghorn antelope, mule deer, sage grouse, white-tailed prairie dogs, and reptiles. Raptors often hunt in big sagebrush shrubland habitat, and sage grouse leks are typically located on ridge tops that are dominated by cushion plant communities.

The Lowland Big Sagebrush Shrubland wildlife habitat (**Figure 3.6-3**) is found along drainages in areas with relatively steep slopes. This habitat type has significantly more vegetation cover than the Upland Big Sagebrush Shrubland. The Lowland Big Sagebrush Shrubland wildlife habitat also provides important cover for resident and migratory birds, reptiles, and small mammals. The taller big sagebrush provides nesting sites for raptors and critical forage for ungulates and sage grouse during winters with extreme snowfall.

Species Lists

A list of wildlife species that potentially occur in the Permit Area is provided in **Table 3.6-4**. A total of 224 wildlife species potentially occur in the Permit Area. Of these, 164 species are birds, 51 species are mammals, four species are amphibians, and five species are reptiles. Species that are known to exist in the study area, from observation or the presence of identifying signs, are denoted with an asterisk in **Table 3.6-4**.

3.6.3.2 Methods

File and Data Searches

Locations of raptor nest sites, sage grouse leks, prairie dog towns, big game ranges, and T&E species were obtained from GIS data from the BLM and WGFD. WGFD publications and the computerized WGFD Wildlife Observation System (WOS) of the Permit Area were reviewed (**Attachment 3.6-1**) along with FWS publications.

A copy of the Sweetwater Uranium Facility Environmental Report (Shepherd Miller, Inc., 1994) that covered a study area southwest of the Permit Area was also reviewed. The Shepherd Miller study was used as an initial survey reference for the area for T&E plant and animal species, big game ranges, sage grouse leks, and raptor nest sites.

Field Surveys

Field surveys for sage grouse leks, raptor nest sites, and breeding birds were completed in the Permit Area between early April and October 2006; additional sage-grouse-lek and nesting raptor surveys were completed during the spring of 2007. Pygmy rabbit surveys were completed during June and July of 2007. The presence of other wildlife species or

their identifying signs were also recorded, and all observed species are included in **Table 3.6-4**. Breeding bird surveys were conducted within the Permit Area; surveys for raptor nests and sage grouse also included one- and two-mile buffer areas, respectively. Pygmy rabbit surveys were conducted in random transects within the Permit Area.

General field surveys were completed by traversing the Permit Area and the surrounding area in a high-wing aircraft, four-wheel drive vehicles, and on foot. Binoculars and spotting scopes were used for observations. Specific survey methods for individual species or groups of species are presented in **Attachment 3.6-2**. Wildlife surveys were completed according to a work plan developed in consultation with the WGFD, WDEQ, and BLM. The scope of field work was finalized in consultation with BLM in Rawlins, Wyoming, in February and March of 2006 (BLM, 2006). The field survey protocols were consistent with recommendations from both BLM and WGFD (**Attachment 3.6-3**).

3.6.3.3 Results

The following sections provide the results from the file searches and field studies, along with relevant figures, tables, and maps. **Table 3.6-4** provides a list of wildlife species that have the potential of occurring in the study area. **Attachment 3.6-1** includes the WGFD WOS record of wildlife species previously observed in the Permit Area.

Big Game

Specific big game surveys were not required for the Project (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006); however, the relative abundance of big game observations during the course of field work was recorded and is presented in **Table 3.6-5**.

Pronghorn, mule deer, and elk were the only big game animals recorded in the Permit Area during field observations in 2006 and 2007. WGFD observations in **Attachment 3.6-1** indicate that pronghorn are the most abundant big game species in the study area. Pronghorn use of the study area, as determined by WGFD and BLM, is shown on **Figure 3.6-4**. The Permit Area is classified as Winter/Yearlong Range. Winter/Yearlong Range is the area where a population of animals makes general use of the habitat on a year-round basis, and there is a significant influx of animals between December and April. The study area comprises a portion of the Red Desert Antelope Herd Unit (WGFD Hunt Area 61). Based on the most current Annual Big Game Herd Unit Job Completion Reports (JCRs) (WGFD 2006a), the Red Desert Antelope Herd had a five-year (2000 through 2005) average population of 14,454 pronghorns.

A map of mule deer use of the study area is presented in **Figure 3.6-5**. The Permit Area is out of mule deer range. Areas described as "out of range" contain few animals or the available habitat is of limited importance to the species.

Elk use of the study area is mapped in **Figure 3.6-6**. Elk likely use the Permit Area as transitional range while moving to other areas. The 2005 WGFD data defines the seasonal range of the elk to be outside of the Permit Area. The 2007 WGFD Herd Unit Data describes two herds, the Shamrock Elk Herd Unit (#643) and the Steamboat Elk Herd Unit (#426), as being situated on or near the Permit Area.

The Permit Area is classified as out of moose range (as determined by WGFD and BLM; **Figure 3.6-7**); no moose or sign of moose were observed in the study area.

Upland Game Birds

Field surveys of upland game birds focused on sage grouse strutting grounds, also known as leks. All known strutting grounds were inventoried, and the entire study area within two miles of the Permit Area was searched for additional leks. Three aerial surveys were completed for new leks during April of 2006 and 2007. In addition, ground surveys of new leks were completed by driving on roads within the study area and listening for booming sage grouse. Aerial surveys were completed by flying north-south transects in a fixed-wing aircraft at an altitude of 330 to 490 feet (100 to 150 meters) above ground level, with a transect spacing of about 0.6 miles (one kilometer). Lek attendance surveys, which document the number of male sage grouse observed at each lek, were completed on the ground three times for each known lek during April of 2006 and 2007. Sage grouse brood surveys were not required by BLM and WGFD (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006).

Sage grouse and mourning doves were the only upland game birds noted in the study area. Sage grouse may inhabit the area year-long, but mourning doves are migrants and only inhabit the area from spring into early fall. No active sage grouse leks were located in the Permit Area. The Crooked Well Lek, which is a known strutting ground along the northeast boundary of the Permit Area (Township 25 North, Range 92 West, Section 16), was inactive during three site visits in April 2006 (**Figure 3.6-8**). Four males were observed on the lek on April 4, 2007, but no sage grouse were present in the other two lek surveys; therefore, it is considered inactive. No other birds were observed on the lek during 2007. Six active leks were located within the two-mile buffer zone. The locations and lek attendance of these leks are presented in **Figure 3.6-8** and **Table 3.6-6.**

Five of the six active leks had been previously mapped by WGFD. The Discover 2 Lek, located in Township 25 North, Range 93 West, Section 23, approximately 0.7 miles west

of the Permit Area, is a newly mapped active lek. It appears to be a satellite of the previously mapped Discover Lek, 0.5 miles to the west. The Prospect South Lek (Township 25 North, Range 92 West, Section 3, Southwest Quarter) is located approximately 0.75 miles south of the Prospect Lek. These are new leks not previously mapped by WGFD or located during the 2006 surveys. The Green Ridge Satellite Lek is located approximately 0.2 miles west of the Green Ridge Lek. At undisturbed leks, attendance ranged from 17 to 126 males during the April 2006 survey. The most highly frequented leks in 2006 and 2007 were Sand Gully (58 to 126 males), Discover (19 to 69 males), and Prospect (41 to 64 males). All sage grouse leks occurred in association with Upland Big Sagebrush Shrubland communities in areas with cushion plants, blowouts and bare ground. The Sooner and Sooner Oil leks were also counted in 2007 because they are located near off-site transportation routes that may be used by the Project.

Raptors

A raptor nest survey of the entire Permit Area and a one-mile buffer zone was conducted in April and June of 2006, and April, May and June of 2007. The survey provided status updates on nests previously identified by BLM and WGFD and a survey for new nests. Surveys were conducted on foot or using four-wheel-drive vehicles; additional surveys were completed by air while looking for sage grouse leks. Raptor observations were made using binoculars and a high-powered spotting scope. Nest site activity and production surveys were conducted according to protocols vetted by the BLM, Rawlins District (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). Special attention was made to avoid disturbance of any active nests while completing the wildlife surveys.

Agency files were reviewed for data on raptor nests in the area. File searches identified 12 previously documented raptor nests within a one-mile buffer zone of the Permit Area. The status of these nests is presented in **Table 3.6-7** and the locations are presented in **Figure 3.6-9**.

No active raptor nests occur within the Permit Area. Nest FH25921601 was an active ferruginous hawk's nest on an artificial nest structure, which was in excellent condition in previous visits. However, in 2007, Nest FH25921601 was in poor condition, and inactive on multiple visits in 2006 and 2007. One raptor nest was found within the one-mile buffer zone. Nest AFH25921004 was occupied by a pair of ferruginous hawks and was in excellent condition and located on top of artificial nest platforms. Nest AFH25921004 had two or three chicks in the nest when it was last observed on June 15, 2006. Seven other nests that had been previously documented by BLM in the one-mile buffer zone surrounding the Permit Area (**Table 3.6-7** and **Figure 3.6-9**) were not located during the 2006 and 2007 surveys. Global Positioning System (GPS) units were used to visit the

sites of these nests, but none were located. No new raptor nests were identified during the 2006 or 2007 field surveys.

Several other raptor species were recorded within the study area, but nests were not documented. These species include the Swainson's hawk, red-tailed hawk, northern harrier, golden eagle, kestrel, prairie falcon, and turkey vulture. While the conditions are present for the northern harrier and American kestrel nests within the Permit Area, specific nest sites were not located. Northern goshawk, merlin, and peregrine falcons were not observed in the study area.

Waterfowl and Shorebirds

Specific waterfowl and shorebird surveys were not required by the BLM, Rawlins District (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). One shorebird species was observed during bird and wildlife surveys, which is noted in the species list of **Table 3.6-4**. Most recorded waterfowl and shorebird species are designated "uncommon" to "fairly common" in the region.

In the study area, habitat for waterfowl and shorebirds is sparse. The man-made Crooked Well Reservoir was dry during the 2006 field survey and contained a small amount of water during the spring of 2007. Waterfowl and shorebird species would be expected in the Permit Area during migrations in the spring and fall, with additional use in the summer months. Late fall and winter use of the Permit Area by waterfowl and shorebirds is believed to be very limited.

Passerine and Breeding Birds

A breeding bird survey of all representative habitats of the Permit Area was conducted during the peak of the nesting season in June 2006, using methods recommended in WDEQ-LQD Wildlife Guideline No. 5 Wildlife (1994). Surveys took place in the morning between 0500 to 0930 hours. One 3,280-foot (1,000-meter) transect was established in each habitat within the Permit Area. In Upland Big Sagebrush Shrubland, 328-foot- (100-meter-) wide belt transects were walked, and all birds that were heard or observed were recorded. In riparian zones, where limited habitat size precluded 3,280-foot- (1,000-meter-) wide transects, point transects with 328-foot- (100-meter-) wide spacing were surveyed for five minutes; all birds heard or observed within 164 feet (50 meters) were recorded.

All avian species observed are documented in the species list in **Table 3.6-4**. A total of 31 passerine species were recorded during surveys. The most common species in the Permit Area were the horned lark, Brewer's sparrow, and sage sparrow.

Species observed in the Upland Big Sagebrush Shrubland habitat were similar to species observed in the Lowland Big Sagebrush Shrubland habitats. There were 12 breeding species seen in each of the big sagebrush habitats during breeding bird surveys.

Migratory Birds of High Federal Interest

MBHFI and other wildlife species were inventoried during all site visits. This was accomplished by searching all suitable or potentially suitable habitats and recording all species encountered.

Several MBHFI species are known to occur in the region (**Attachment 3.6-4**). Level I MBHFI species are described by FWS as in need of conservation, while Level II MBHFI species are described as in need of monitoring. Level I MBFHI species in the region include the bald eagle, ferruginous hawk, Swainson's hawk, peregrine falcon, burrowing owl, sage grouse, mountain plover, Brewer's sparrow, and sage sparrow. Of these, the ferruginous hawk, sage grouse, Brewer's sparrow, and sage sparrow were documented in the Permit Area; the mountain plover and burrowing owl have been noted in adjacent areas (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006).

Level II species documented in the Permit Area include the sage thrasher, loggerhead shrike, vesper sparrow, and lark sparrow. Level II MBHFI species known to exist in the region, but not documented in the study area, include the merlin, Cassin's kingbird, sage thrasher, black-billed cuckoo, loggerhead shrike, and lark bunting.

The ferruginous hawk nests in the study area were previously discussed in this section. Sage grouse mating and nesting in the study area and their strutting grounds were previously discussed in this section as well. The breeding Brewer's sparrow and sage sparrow were found throughout the big sagebrush habitats of the Permit Area. The breeding sage thrasher, loggerhead shrike, vesper sparrow, and lark sparrow were also located within the Permit Area.

No mountain plover were observed on or near the Permit Area during spring and early summer of the 2006 and 2007 field studies. The Permit Area was evaluated for mountain plover habitat. The extensive tall shrub cover and absence of grassland or open shrub habitats make the Permit Area poorly suited to the mountain plover. Small open areas (grassland and disturbed blowouts) do occur in the Permit Area, but are isolated. Mountain plover prefer open grasslands, bare ground, disturbed areas, prairie dog colonies and sparse shrubland habitats for nesting. Good potential mountain plover habitat occurs a few miles to the south and west of the Permit Area. However, since no good potential mountain plover habitat exists in the study area and no mountain plover

were observed during other field studies, it is unlikely that mountain plovers inhabit the Permit Area.

Other Mammals

All mammal species and identifying signs observed during the field studies were recorded and are documented on the species list in **Table 3.6-4**. A total of 19 mammal species were recorded in the study area. The most common species seen were the white-tailed jackrabbit, desert cottontail, Wyoming ground squirrel, thirteen-lined ground squirrel, deer mouse, and meadow vole. The coyote was the most abundant predator. The majority of mammalian species were observed in big sagebrush habitats.

Two wild horse HMAs overlap with the Permit Area. The Permit Area is within the Stewart Creek HMA and the Lost Creek HMA. Horses were seen in all habitats of the study area.

Aerial and ground surveys of the entire Permit Area were used to locate prairie dog towns. There were no active colonies in the Permit Area.

T&E and State-Listed Species of Concern

Threatened, endangered, and candidate wildlife species surveys were completed during all site visits by searching suitable habitats for the target species. The specific survey techniques used to identify each species and their potential of occurrence in the Permit Area are included in **Table 3.6-8**.

The bald eagle (threatened) and black-footed ferret (endangered) are the only federally listed or candidate species that may occur in the vicinity of the Permit Area (FWS, 2006). Bald eagle nesting habitat does not exist within the study area, but they might be found in the Permit Area during migration. The bald eagle has not been recorded in the study area (**Attachment 3.6-1**).

A black-footed ferret survey was not required, since black-footed ferrets live exclusively in prairie dog colonies, which are not present within the Permit Area.

The state-listed wildlife species (WGFD, 2005a, 2005b) not included under other wildlife categories, and their probability of occurrence in the Permit Area, are listed in **Table 3.6-9.** State-listed species that may occur in the Permit Area are classified as Native Species Status (NSS) 2, 3, or 4 (WGFD, 2005a). Status 2 species have declining populations that are threatened with extirpation, and have restricted or vulnerable habitat. These species may also be sensitive to human disturbance or have significant habitat loss. Status 3 species have: 1) populations that are restricted or declining with the threat of extirpation,

2) habitat that is restricted or vulnerable, or 3) a wide distribution and unknown population, with significant habitat loss. Status 4 species have: 1) populations that are restricted or declining with stable habitat, 2) widely distributed stable populations with restricted habitat that are sensitive to human disturbance, or 3) stable or increasing populations with significant loss of habitat.

Listed waterfowl and shorebird species such as the American white pelican, upland sandpiper, and long-billed curlew, and passerines, such as McCown's longspur, chestnut-collared longspur, and bobolink, are unlikely to be in the Permit Area, because there is no suitable habitat for these species; they may pass through the Permit Area during migration. The sage thrasher, Brewer's sparrow, and sage sparrow (all NNS4 species) were observed in the Permit Area. Suitable habitat exists for the willow lark bunting, though this species was not observed.

State-listed mammal species that may occur in the Permit Area have been classified as Native Species Status 2, 3, or 4 (WGFD, 2005b). Several listed shrew and bat species, such as the dwarf shrew, vagrant shrew, hoary bat, and silver-haired bat, have ranges that include the Permit Area. There is no suitable habitat in the study area, so they are unlikely to be present. Suitable roosting habitats for the western small-footed myotis, little brown myotis, long-legged myotis, big brown bat, Townsend's big-eared bat, and pallid bat might be found in rock crevices, rock outcrops, or trees near the Stratton Rim to the north of the Permit Area. These species could also potentially roost in the vertical walls of eroded streambeds in the Permit Area. None of these species was observed in the Permit Area. The state-listed olive-backed pocket mouse and prairie vole were not observed in the Permit Area. Suitable habitat exists in the Permit Area, and these species are known to be in the region (WGFD, 2004a).

Surveys were conducted for Pygmy rabbits (NNS3 species). Pygmy rabbits were observed in the Permit Area during the summer of 2007. Based on these surveys Pygmy rabbits occur in all Lowland Big Sagebrush Shrubland habitats (**Figure 3.6-1**). Scat, burrows, and individual Pygmy rabbits were observed along every transect within the Lowland Big Sagebrush Shrubland habitats of the study area.

Reptiles and Amphibians

Specific reptile and amphibian surveys were not required for the Project (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). Several species were observed during general surveys, as noted in **Table 3.6-4**. These included the greater short-horned lizard, prairie rattlesnake, and western terrestrial garter snake.

Fish

The Permit Area is predominately dry shrubland, and there is no aquatic habitat for most of the year. The Crooked Well Reservoir is an ephemeral stock pond that is dry except for a short period of time after spring snowmelt. No fish or other aquatic life occur.