APPENDIX J

BIOLOGICAL ASSESSMENT FOR FEDERALLY LISTED SPECIES UNDER THE ENDANGERED SPECIES ACT

APPENDIX J: BIOLOGICAL ASSESSMENT FOR FEDERALLY LISTED SPECIES UNDER THE ENDANGERED SPECIES ACT

Introduction

On March 24, 2006, Kiewit Mining Properties, Inc. (Kiewit) filed an application with the Bureau of Land Management (BLM) under the 43 Code of Federal Regulations (CFR) 3425 (Leasing on Application) for federal coal reserves in the Hay Creek II lease by application (LBA) tract (Proposed Action). The Hay Creek II LBA tract is located northwest of and immediately adjacent to existing coal leases at the Buckskin Mine, in northern Campbell County, Wyoming (map J-1).

The physical areas discussed in this assessment are defined as follows:

- proposed tract—the Hay Creek II tract as applied for (Proposed Action, 419 acres);
- BLM study area—proposed tract plus lands added by the BLM under Alternative 2 for the analysis process (1,883 acres); and
- general analysis area—the maximum area of potential surface disturbance (2,847 acres) that would result from leasing the largest possible tract (i.e., the entire BLM study area and the 0.25-mile mine support area to the north and west)[1].

Map J-2 illustrates these three areas.

Under the Proposed Action, coal extraction would occur in the entire proposed tract (approximately 419 acres). Activities related to mining the proposed tract would occur within the support area, a 0.25-mile-wide area north and west of the proposed tract (approximately 241 acres); disturbance from existing mine-related activities would continue in the remainder of the overlap area[2] (approximately 474 acres).

Under Alternative 1, disturbance from mine-related activities associated with existing coal leases would continue in the overlap area (approximately 656 acres).

Under Alternative 2, coal extraction would occur in an alternative tract configuration within the BLM study area (up to approximately 1,883 acres). Disturbance from mine-related activities would occur within the support area, a 0.25-mile-wide area north and west of the alternative tract configuration (up to approximately 926 acres); disturbance from existing mine-related activities would continue in the remainder of the overlap area (approximately 38 acres).

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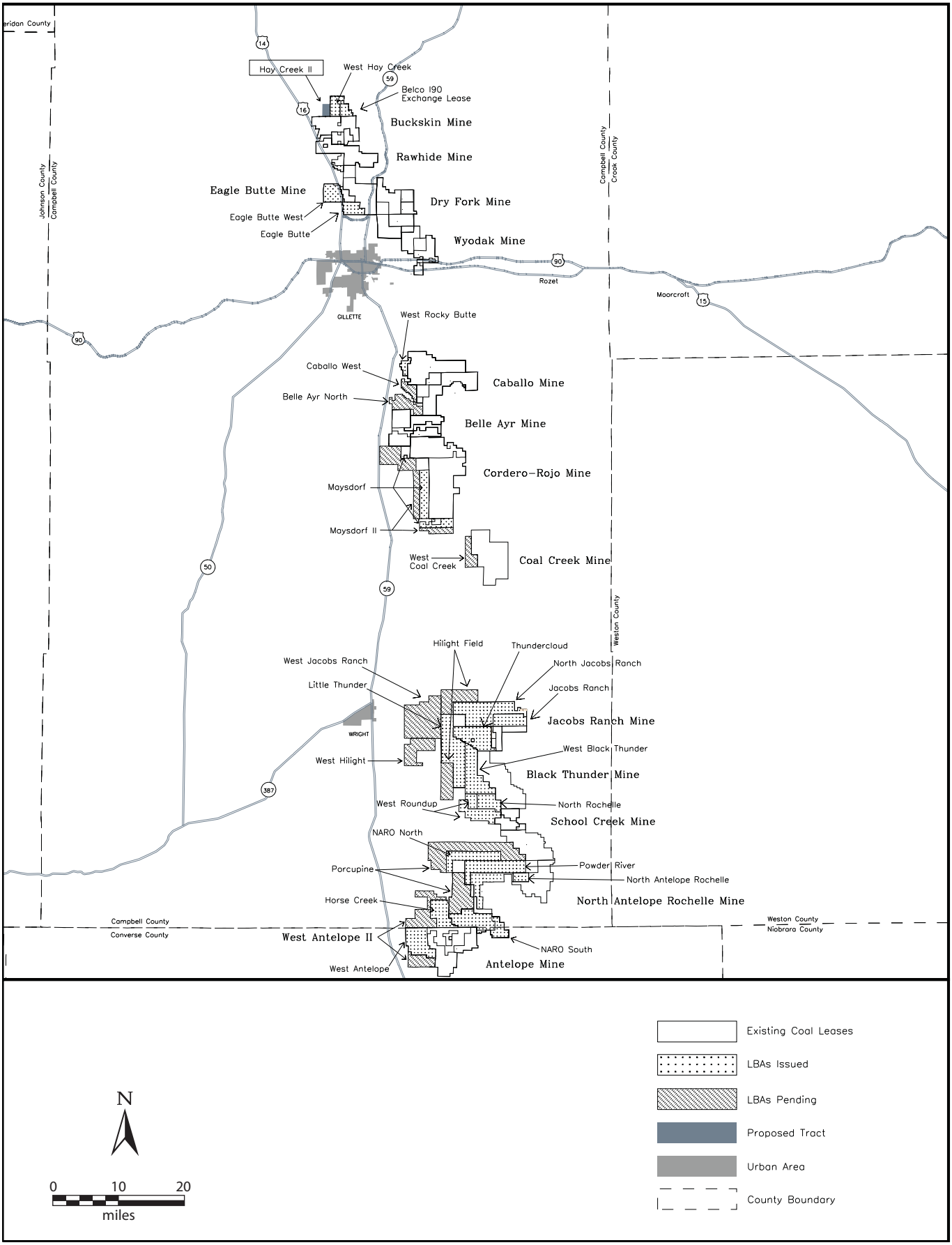
[1] Additional disturbance beyond the final lease boundary is necessary to recover all of the coal resources within the final tract configuration. Such disturbance includes, but is not limited to, mine support activities such as topsoil stripping, stockpile storage highwall back-sloping (including catch benches), highwall reduction after mining to match undisturbed topography, and construction of flood- and sediment-control structures.

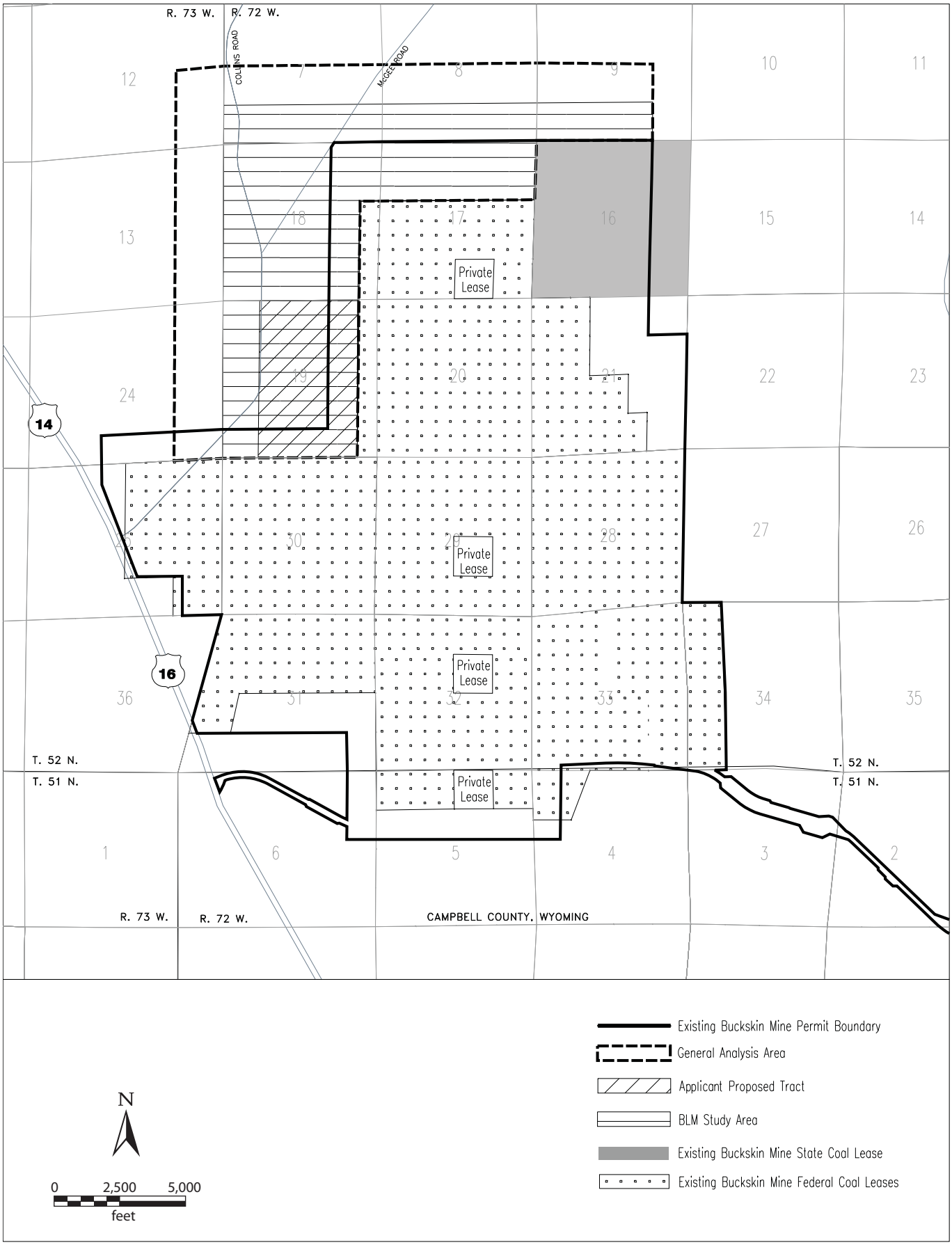
[2] The area of overlap between the general analysis area and the existing Buckskin Mine permit area. Disturbance in this area is from mine-related activities associated with existing coal leases.



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map J-1

General Location Map with Federal Coal Leases and LBA Tracts



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map J-2
General Analysis Area

This biological assessment was prepared in accordance with Section 7 of the Endangered Species Act of 1973 (ESA). Its purpose is to disclose the potential effects on federally listed (e.g., threatened, endangered, candidate) plant and animal species managed under the authority of the ESA that are known to be present or that may be present in the general analysis area. The ESA requires federal agencies to ensure that all actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any federally listed species, or result in the destruction or adverse modification of their critical habitat.

The following are the objectives of this biological assessment:

- To comply with the requirements of the ESA that actions conducted or authorized by federal agencies do not jeopardize federally listed species or adversely modify their critical habitat.
- To provide a process and standard to ensure that federally listed species receive full consideration in the decision-making process.

Consultation and Coordination

The BLM received the Hay Creek II coal lease application on March 24, 2006. The BLM, Wyoming State Office, Division of Minerals and Lands, initially reviewed the application and ruled that the application and lands involved met the requirements of regulations governing coal leasing on application (43 CFR 3425). The Powder River Regional Coal Team reviewed this lease application at a public meeting held in Casper, Wyoming, on April 19, 2006, following Kiewit's presentation about the existing Buckskin Mine and the pending lease application for the proposed tract. That entity recommended that the BLM continue to process this application.

The major land use planning decision that the BLM must make concerning federal coal resources is a determination of which coal reserves are acceptable for further consideration for leasing. The BLM uses four screening procedures to identify these coal reserves. Only those federal coal reserves that pass these screens receive further consideration for leasing. The BLM has applied these coal screens to federal coal reserves in Campbell County several times, beginning in the early 1980s. In 1993, the BLM began the most recent process of reapplying these screens in Campbell, Converse, and Sheridan counties in eastern Wyoming. This screening analysis process, which includes the portion of Campbell County where the proposed tract is located, was adopted in the 2001 *Approved Resource Management Plan for Public Lands Administered by the BLM Buffalo Field Office* (BLM 2001), and the results were included as appendix D of that update. That document can be viewed in the 2001 documents section on the Wyoming BLM website at: http://www.blm.gov/rmp/WY/application/index.cfm/rmpid=101. The general analysis area discussed in this biological assessment is included in the area determined to be "acceptable for further consideration for leasing" as part of the coal screening process.

During this screening process, consultation with the U.S. Fish and Wildlife Service (USFWS) occurred in conjunction with the unsuitability findings under Criterion 9 (Critical Habitat for Threatened or Endangered Plant and Animal Species), Criterion 11 (Bald or Golden Eagle Nests), Criterion 12 (Bald and Golden Eagle Roost and Concentration Areas), Criterion 13

(Falcon Nesting Site[s] and Buffer Zone[s]), and Criterion 14 (Habitat for Migratory Bird Species).

The USFWS maintains a list of threatened, endangered, and candidate species, and designated critical habitats for each county in Wyoming on their official website: http://www.fws.gov/mountain-prairie/species/wyoming. The agency updates those species lists annually, or more frequently, if any listing changes occur. Posting these species lists on the USFWS website fulfills the obligation of the USFWS, under Section 7 of the ESA, to provide a list of threatened and endangered species upon request for federal actions and National Environmental Policy Act compliance.

A memorandum issued on August 8, 2007 between the USFWS and BLM provided recommendations for protective measures for threatened and endangered species in accordance with the ESA. Protective measures for migratory birds in accordance with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and recommendations for the protection of wetlands (under Executive Order 11990 and Section 404 of the Clean Water Act) and for other fish and wildlife resources (under the Fish and Wildlife Coordination Act and the Fish and Wildlife Act of 1956) were also included. The memorandum identified the greater sage-grouse (*Centrocercus urophasianus*) as a species of specific interest and emphasized the importance of identifying grouse habitats within the lease area, as well as appropriate mitigation measures to minimize potential impacts on this species.

The Wyoming Game and Fish Department (WGFD) provided the BLM with scoping comments for the Proposed Action in April 2007 (Emmerich pers. comm.). The WGFD recommended that consideration be given to possible impacts on big game, sage-grouse, raptors, and nongame species and their habitats, and aquatic resources in the general analysis area. The WGFD reviewed the draft EIS for the Hay Creek II LBA and had no concerns about terrestrial wildlife (including sage-grouse) or aquatic species pertaining to that coal lease application. That assessment was provided by the WGFD to the BLM in a letter dated May 6, 2010.

Regulatory Requirements and Mitigation

The BLM leasing process does not authorize mining of federal coal reserves. The lease merely grants the lessee the exclusive right to pursue a mining permit for the leased tract subject to the terms and conditions of the lease, the mining permit itself, and all applicable state and federal laws. However, the impacts of mining the coal are considered at the leasing stage because they are a logical consequence of that process.

The Office of Surface Mining Reclamation and Enforcement and Wyoming Department of Environmental Quality (WDEQ) are the federal and state agencies, respectively, responsible for regulating surface coal mining operations in Wyoming. After the BLM has made a leasing decision, a more detailed analysis will be required prior to mining the new coal reserves. As part of that analysis process, the lessee submits an application for a surface mining permit to WDEQ and other affected state and federal agencies. The permit application includes detailed descriptions of proposed mining plans, as well as monitoring, reclamation, and mitigation plans

designed to address known and potential impacts from mining the coal in the leased tract. Those plans are developed and implemented based on extensive baseline information collected as part of the permitting process, as required by the Surface Mining Control and Reclamation Act of 1977 (SMCRA) and Wyoming law.

If the federal coal reserves adjacent to the Buckskin Mine are leased, it would be considered a maintenance lease for the existing Buckskin Mine, which currently has both an approved Mineral Leasing Act of 1920 mining plan and approved state mining and reclamation permits. Those existing documents must be amended to include any newly leased area before it can be actively mined. To amend the existing mining plan and associated permits, Kiewit would be required to submit a detailed permit application package to WDEQ as described above. The proposed mining, monitoring, reclamation, and mitigation plans for the new lease area must be approved by multiple state and federal agencies, including the USFWS, before a permit to mine new coal reserves is issued. Those approval documents are included in the WDEQ's review process to ensure the permit application is complete and complies with all requirements, and that the coal mining operation will meet the performance standards of the approved Wyoming program. If the permit application package complies with the numerous and stringent requirements, the WDEQ would issue an amended permit to the applicant that would allow the permittee to extend coal mining operations into the newly acquired lease area.

Protection of fish, wildlife, and related environmental values is required under SMCRA regulations at 30 CFR 816.97, which state:

> No surface mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary of which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended.

To comply with this regulation, Section 7 Consultation would be required before amendments to the existing mining and reclamation plan are approved to add the newly acquired lease area. That consultation process occurs at the permitting stage because specific details regarding the actual location of the disturbance areas in the new lease area, how and when they would be disturbed, and how they would be reclaimed are not available at the leasing stage. If the USFWS deems it appropriate, additional measures to ensure compliance with the ESA and SMCRA can be developed at that time based on potential impacts on listed species from proposed mining operations in the new lease area.

The following is a partial list of measures related to federally-protected species that are required as part of the mining and reclamation permits:

- avoiding bald eagle (*Haliaeetus leucocephalus*) disturbance per the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act;
- restoring bald eagle foraging areas disturbed by mining;
- using raptor safe power lines (APLIC 2006);

- surveying for Ute ladies'-tresses and other listed plant species if habitat is present; and
- implementing species-specific protective measures for listed species as the need arises.

The August 2007 memorandum between the USFWS and BLM stated that the USFWS would work with the BLM to ensure that the species-specific protective measures and programs for the conservation and recovery of listed species as required by under Section 7 of the ESA are satisfied and carried out. The current permit document for the Buckskin Mine includes a commitment to implement species-specific protective measures for federally listed species as needed. That commitment would be updated to include any newly leased or permitted lands associated with the Hay Creek II LBA prior to any new surface disturbance on those lands; updates to the protective measures themselves would also occur, as applicable.

In addition to disallowing any surface mining activity that is likely to jeopardize the continued existence of endangered or threatened species, SMCRA regulations at 30 CFR 816.97:

- require the operator to minimize disturbances and adverse impacts on fish, wildlife, and other related environmental values; and
- require that the operator use the best technology currently available to:
  - minimize electrocution hazards to raptors (APLIC 2006);
  - locate and operate haul and access roads to avoid or minimize impacts on important fish and wildlife species; and
  - design fences, conveyors, and other potential barriers to permit passage of large mammals.

Description of the Proposed Action and Alternatives

The Proposed Action

Under the Proposed Action, the BLM would hold a competitive sale and would issue a lease for the federal coal reserves included in the proposed tract. The Proposed Action assumes that Kiewit would be the successful bidder and would incorporate the proposed tract into its existing mine operations. The Proposed Action would not expand operations at the Buckskin Mine, but would maintain current levels of production for an additional period of time. The facilities and infrastructure would be the same as those currently identified in the WDEQ Mine Permit 500 Term T7, approved May 22, 2006, and the *BLM Resource Recovery and Protection Plan*, approved June 16, 2006 (BLM 2006).

The legal description of the proposed tract is provided in table J-1. The entire surface of the existing Buckskin Mine permit area and general analysis area is privately owned by individuals or companies, while most of the subsurface minerals (all of the coal and the majority of oil and gas reserves) are federally owned. All oil and gas production facilities located in the general analysis area are privately owned.

Table J-1. Legal Description of Proposed Tract

Campbell County, Wyoming, Sixth Principal Meridian Township 52 North, Range 72 West		Acres
Section 19:	Lot 5 (W ½)	20.71
	Lot 6	41.42
	Lot 7	42.45
	Lot 10	42.31
	Lot 11	41.68
	Lot 12 (W ½)	20.84
	Lot 13(W ½)	20.935
	Lot 14	41.75
	Lot 15	41.90
	Lot 18	41.97
	Lot 19	42.01
	Lot 20 (W ½)	21.065
Total Acres		419.04

The proposed tract includes approximately 419.04 acres. As discussed previously, it is assumed that an area larger than the proposed tract would be disturbed to allow recovery of all coal resources. Therefore, approximately 478 acres, including a mine support area north and west of the proposed tract, would be disturbed to recover the coal reserves within the proposed tract under this alternative. Surface disturbance beyond the proposed lease boundary would be due to activities such as topsoil stripping, stockpile storage, matching reclaimed topography to premining contours, constructing flood- and sediment-control structures, and numerous other similar operations.

Much of the western boundary of the proposed tract is adjacent to Campbell County Road 23 (Collins Road). In accordance with SMCRA, and as specified under unsuitability criterion 3 (43 CFR 3461), lands within 100 feet of the outside line of the right-of-way of a public road are considered unsuitable for surface coal mining. Consequently, the coal reserves underlying the Collins Road, its right-of-way, and an associated 100-foot buffer zone cannot be accessed under current conditions unless Kiewit pursues an exception to this prohibition and the Campbell County Board of Commissioners allows the public road to be relocated or closed. Neither the applicant nor the commissioners has submitted a proposal to move this road, and Kiewit does not anticipate pursuing that option.

Alternative 1 (No Action)

Under Alternative 1, the No Action Alternative, Kiewit's application to lease the coal included in the proposed tract would be rejected: federal coal reserves adjacent to the existing Buckskin

Mine would not be offered for competitive sale, and the additional coal would not be mined. However, selection of this alternative would not preclude Kiewit or another company from submitting a future lease application for these adjacent coal reserves.

Under Alternative 1, currently permitted mining activities associated with existing coal leases at the Buckskin Mine would not be affected. The facilities, infrastructure, employment levels, and reclamation efforts under this alternative would be the same as those currently identified in the WDEQ Mine Permit 500 Term T7, approved May 22, 2006, and the *BLM Resource Recovery and Protection Plan*, approved June 16, 2006 (BLM 2006). Approximately 656 acres of the general analysis area overlaps the existing permit boundary. Therefore, under the No Action Alternative, activities associated with mining existing leases would occur in this overlap area, but would be limited to topsoil stripping, stockpile storage, and other support activities related to mining existing coal leases. Average annual production would continue as described under the Proposed Action.

Alternative 2

Under Alternative 2, the BLM would hold a competitive sale and would issue a lease for the federal coal reserves included in an alternative tract configuration. The alternative tract configuration would be defined by the BLM from lands within the BLM study area (map J-2) to be technically, economically, and environmentally preferable to the proposed tract. The alternative tract configuration could be smaller than the proposed tract, or include part or all of the BLM study area. As described previously, additional disturbance would occur due to mine-related activities in the support area north and west of the final tract configuration.

As under the Proposed Action, Alternative 2 assumes that Kiewit would be the successful bidder and would incorporate the alternative tract configuration into its existing mine operations. Alternative 2 would not expand operations at the Buckskin Mine, but would maintain current levels of production for up to six more years.

Table J-2 provides the legal description of the BLM study area.

Table J-2. Legal Description of BLM Study Area

Campbell County, Wyoming, Sixth Principal Meridian Township 52 North, Range 72 West	Acres
Section 7: Lots 17 through 20	166.91
Section 8: Lots 13 through 16	162.00
Section 9: Lots 13 through 15	120.58
Section 17: Lots 1 through 4, 5 (N. ½), 6 (N. ½), 7 (N. ½), and 8 (N. ½)	247.39
Section 18: Lots 5 through 11, 12 (N. ½, SW. ¼), 13 (W. ½), 14 through19, and 20 (W. ½)	612.95
Section 19: Lots 5 (W. ½), 6 through 11, 12 (W. ½), 13 (W. ½), 14 through 19, and 20 (W. ½)	573.27
Total Acres	1,883.10

Not all of the coal included in the proposed tract and BLM study area is considered mineable at present. An occupied residence and a portion of the Collins and McGee roads overlie some of the coal included under Alternative 2. As discussed under the Proposed Action, SMCRA prohibits mining within 100 feet on either side of the right-of-way of any public road (43 CFR 3461); the same prohibition applies to lands within 300 feet of an occupied residence. Kiewit is not considering acquiring the surface rights to the occupied residence, and has not applied to relocate either of the county roads. Consequently, additional coal reserves between the two roads would not be disturbed if the coal under the roads was not mined. Although the federal coal underlying the county road right-of-way and associated buffer zones may not be mined, it is included in the analysis because it would allow maximum recovery of the mineable coal adjacent to, but outside of the rights-of-way and associated buffer zones.

If a decision is made to hold a competitive lease sale, and if the sale has a successful bidder, a lease would be issued for federal coal reserves within the final tract delineation, as determined by the BLM. It is assumed that the applicant would be the successful bidder at the lease sale. The final tract configuration offered for lease would be subject to standard and special lease stipulations developed for the Wyoming Powder River Basin (PRB).

One stipulation developed for the Wyoming PRB relating to threatened and endangered species is presented below:

> THREATENED, ENDANGERED, CANDIDATE, or OTHER SPECIAL STATUS PLANT and ANIMAL SPECIES – The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or that have other special status. The Authorized Officer may recommend modifications to exploration and development proposals to further conservation and management objectives or to avoid activity that will contribute to a need to list such species or their habitat or to comply with any biological opinion issued by the Fish and Wildlife Service for the Proposed Action. The Authorized Officer will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act. The Authorized Officer may require modifications to, or disapprove a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species, or result in the destruction or adverse modification of designated or proposed critical habitat.
>
> The lessee shall comply with instructions from the Authorized Officer of the surface managing agency (BLM, if the surface is private) for ground disturbing activities associated with coal exploration on federal coal leases prior to approval of a mining and reclamation permit or outside an approved mining and reclamation permit area. The lessee shall comply with instructions from the Authorized Officer of the Office of Surface Mining Reclamation and Enforcement, or his designated representative, for all ground disturbing activities taking place within an approved mining and reclamation permit area or associated with such a permit.

General Setting

The terrain in the general analysis area consists primarily of gently sloping uplands and relatively level agricultural fields, with more rugged terrain in the northeastern portion of the area. Elevations in the general analysis area range from approximately 4,080 to 4,380 feet above mean sea level.

Predominant wildlife habitat types classified in the general analysis area broadly correspond with the major plant communities defined during the vegetation baseline study. The proposed tract is dominated (approximately 71%) by various upland grassland habitats. Habitats in the general analysis area are comprised primarily (71%) of upland grasslands (approximately 40%) and agricultural lands (croplands and pastures, 31%). No sand dunes or prairie dog (*Cynomys* spp.) colonies are present in the general analysis area.

No major drainages pass through the proposed tract itself, though a closed, unnamed drainage system crosses its northwestern corner. Hay Creek flows from west to east through the northern half of the general analysis area, with a considerable portion passing through the existing Buckskin Mine permit area. Several primary and secondary tributaries are also in that area. Under natural conditions, Hay Creek and all tributaries in the area are considered ephemeral (i.e., respond only to rainfall or snowmelt events). The determination of stream classification was made using the flume monitoring data collected by the Buckskin Mine and reported in the existing permit document.

The National Wetland Inventory (NWI) mapping system shows several wetlands occurring in the general analysis area (USFWS 2007). Many of these areas correspond with wetlands and other waters of the U.S. that were identified during previous wetland delineations of the Buckskin Mine; however, some of the information shown on these maps is relatively old and does not reflect current conditions. Based on the NWI maps, approximately 64.44 acres of wetlands have been identified in the general analysis area. Of these, 30.7 acres were determined to be potentially jurisdictional wetlands based on field observations; the remaining 33.74 acres were initially determined to be nonjurisdictional non-wetlands (e.g., borrow pits, old impoundments) or no longer present. The majority of the potential jurisdictional wetlands were associated with Hay Creek and other ephemeral tributaries in the general analysis area. Some wetlands previously mapped on the NWI may have been altered due to agricultural uses and permitted mine disturbance or water production related to coal bed natural gas (CBNG) production in the general analysis area.

Wetlands occur in a variety of forms in the general analysis area, with palustrine wetlands being the most common and abundant. Palustrine wetlands are defined by their close association with emergent herbaceous marshes, swales, or wet meadows and are supported by saturated soils along the banks of the drainages (Cowardin et al. 1979). Wetlands support a variety of vegetation types and occur mainly along drainages in the general analysis area. Hydrology for these areas is provided primarily by surface runoff from adjacent uplands and discharged CBNG waters.

Hay Creek, which flows primarily from the west to east, and several other tributaries that generally flow into Hay Creek, are waters of the U.S. These tributaries are primarily intermittent stream channels, open water, and other stream channels that carry water but do not meet the criteria for classification as wetlands. The Buckskin Mine's approved mining plan allows disturbance of a portion of the Hay Creek channel. Beginning in 2006, approximately 1.75 miles of the channel were diverted into the Hay Creek Diversion to facilitate mining in the northern extent of the existing Buckskin Mine permit area; the diversion runs through the overlap between the general analysis area and the existing permit area.

Soils in the general analysis area consist mainly of loams, sandy loams, and some clay loams. One hydric soil unit, Felix Clay, is located in the general analysis area (NRCS 2008), on slopes ranging from 0 to 2% and in soils that are developing in alluvium derived from sandstone and shale on gently sloping uplands.

CBNG discharge water has increased the frequency and duration of streamflow events in some portions of the general analysis area. The USFWS NWI maps (2007) show one small wetland (a 0.24-acre diked impoundment) in the extreme northwestern corner of the proposed tract; however, field observations over the years have indicated that it is wet primarily during early spring months. A second NWI inventoried wetland (0.24 acre) in the mine support area north of the proposed tract would be affected by disturbance associated with mine support activities such as topsoil stripping and stockpiling. One playa and one small instream impoundment are in the northwestern portion of the surrounding general analysis area. Those features are also seasonal, with water typically present in spring but dry by mid- to late summer. The playa is the only water body in the general analysis area that provides habitat for waterfowl, shorebirds, and other aquatic species. Due to its limited availability, it serves primarily as a staging area during spring migrations. Due to the lack of permanent water sources, the general analysis area does not support any fisheries.

A wide variety of existing mine facilities, operations, and reclamation activities are present in the overlap between the general analysis area and existing Buckskin Mine permit area, and throughout the permit area itself. Facilities present include storage silos, coal crushing and preparation plants, a railroad spur and loading facility, among others. Mining activities involve a variety of heavy equipment operations that occur 24 hours per day every day of the year; blasting occurs during daylight hours on a nearly daily basis. Reclamation efforts also involve heavy equipment. Disturbance and reclamation activities occur incrementally through the area. Because the mine operates at night, artificial lighting is present in active pit areas and on haul roads to ensure the safety of mine employees.

General Survey Requirements and History

The BLM Data Adequacy Standards for the Powder River Coal Region (BLM 1987) describe the minimum data requirements needed to make coal leasing recommendations within the PRB Coal Production Region. Because most coal mines in the PRB have collected long-term annual monitoring data for both vertebrates and plants as part of their WDEQ permit requirements, and

because most surveys include lands outside the current permit area, the BLM typically accepts that annual monitoring information as meeting the minimum requirements of these standards. The long-term (27 years) database available for vertebrate species in the Buckskin Mine permit area and surrounding lands meets those minimum requirements. Vegetation monitoring and surveys have also been conducted over multiple years, though such surveys are typically limited to the permit area or proposed expansion area and a 0.25-mile-wide support area.

Due to their proximity to the existing Buckskin Mine permit area, the entire proposed tract and the southern third (33%) of the general analysis area have been included in annual wildlife surveys for the last 27 years (1984 through 2010). Approximately 95% of the general analysis area has been surveyed annually for the last nine years (2002 through 2010) in conjunction with a previous permit amendment at the mine. The entire general analysis area and expanded adjacent lands were included in targeted baseline surveys conducted for the LBA process from late 2007 through 2010. All wildlife surveys are conducted according to the most current agency protocols; those protocols are described in detail in the Wildlife Data Report for the Hay Creek II EIS. Those reports can be viewed at the BLM Wyoming High Plains District Office in Casper, Wyoming. Additional wildlife sightings are also recorded during every site visit.

Potential habitat for the Ute ladies'-tresses (*Spiranthes diluvialis*) within the general analysis area was identified prior to field work using the U.S. Geologic Survey quadrangle map or aerial photographs. The NWI system was also consulted. Typically, individual sub-polygons were created within each polygon representing a logical sampling unit.

Habitat Management, Inc. conducted a survey for the Ute ladies'-tresses on August 28, 2008. LandTrak Resources, Inc. conducted another survey for this species on September 9, 2009, with a follow-up survey conducted on August 28, 2010. Both surveys were conducted during the official flowering period, as determined by BLM and USFWS biologists. Habitat Management, Inc. conducted similar surveys for this species in portions of the general analysis area in 2004, 2006, and 2007. During surveys, particular attention was placed on identifying areas where its preferred vegetation canopy and use conditions are met. A 100% pedestrian survey of the vegetation communities with supporting facultative wet or obligatory wetland plant species within the area was performed each year from 2008 through 2010. Because this species is commonly associated with grasses, sedges, rushes, shrubs, and riparian trees, the presence or absence of those plant species was noted. Areas that receive full sunlight or that are only partially shaded are more likely to support populations of this species than deeply shaded sites. Such sites were also noted and recorded during the field surveys. The presence or absence of potential orchid habitat types was physically confirmed through the field surveys. Wetlands in all areas including all stream channels, alluvial terraces, sub-irrigated meadows, and any other locations where the soil has the potential to be at least temporarily saturated within 18 inches of the surface for at least one week during the growing season were identified, located in the field, and plotted on the site map. Highly disturbed or modified sites, upland sites, sites entirely inundated by standing water, sites with heavy clay soils, and very saline sites were noted and excluded from vegetation in soil analysis, since they do not represent a potential Ute ladies'-tresses habitat. Sites with dense stands of reed canarygrass, greasewood, teasel, and common

reed were also excluded from further scrutiny. Areas that support facultative wet or obligatory wetland plant species were identified during the survey.

Habitat Management, Inc. conducted a survey for potential blowout penstemon (*Penstemon haydenii*) habitat in the general analysis area in 2008. LandTrak Resources, Inc. conducted three surveys for the species: June 17, 2009; July 9, 2009; and July 7, 2010. All surveys were conducted in Sandy Prairie vegetation communities in section 18 and section 19, T52N R72W. Potential habitat for this species was identified and divided into logical polygons or sites. Each of these polygons was surveyed for the attributes listed in the USFWS *Penstemon haydenii* memorandum. These attributes include:

- sand dune or blowout features and
- disturbed areas of significantly low ground with sand, sandy loam, or loamy sand soils

Grazed and weedy areas meeting any of the potential habitat conditions for this species noted above were surveyed regardless of grazing use levels or severity of weed infestation.

Threatened and Endangered Species

According to USFWS information (2010) available when this document was initially prepared, four species currently listed or proposed for listing under the ESA could occur in the general analysis area: blowout penstemon (endangered), Ute ladies'-tresses (threatened), greater sage-grouse (candidate), and mountain plover (*Charadrius montanus*) (proposed for listing as threatened). No current threatened or endangered vertebrate species have been observed in or within 1 mile of the general analysis area. No critical habitats for federally listed species, or core or connectivity areas for sage-grouse, have been designated by the USFWS (2010) or the State of Wyoming (2010), respectively, in the general analysis area or surrounding lands.

The black-footed ferret (*Mustela nigripes*) is no longer included as a federally listed species for Campbell County, Wyoming, which includes the general analysis area (USFWS 2010). Additionally, the USFWS issued a block clearance for this species in all black-tailed prairie dog (*Cynomys ludovicianus*) colonies throughout Wyoming in early 2004 (USFWS 2004). Consequently, surveys are no longer recommended for black-footed ferrets in those colonies statewide. Furthermore, the general analysis area is not within the region currently identified for black-footed ferret reintroductions (U.S. Forest Service 2002, Grenier 2003). Although this is not a federally listed species for the general analysis area, it remains on the national list of endangered animals. As a result, the USFWS encourages project proponents to protect all prairie dog colonies or complexes for their value to the prairie ecosystem and the many species that rely on them. The agency further encourages project applicants to analyze potentially disturbed prairie dog colonies for their value to future black-footed ferret reintroductions. No prairie dog colonies will be disturbed under any alternative considered in the analysis for the Hay Creek II EIS.

The following discussion describes species' habitat requirements and their occurrence in the general analysis area, and evaluates the potential environmental effects of the action alternatives on the current federally listed (threatened, endangered, candidate, and proposed) species in the project area.

Additional detailed information on the affected environment in the general analysis area as well as long-term results from annual monitoring in the vicinity are provided in the Vegetation Data Report and Wildlife Data Report, which can be viewed at the BLM Wyoming High Plains District Office in Casper, Wyoming.

Endangered Species

Blowout Penstemon (Penstemon haydenii)

The blowout penstemon, a member of the figwort family, was listed as endangered on October 1, 1987. It was added to the list of threatened and endangered species for Campbell County in 2008. This species is narrowly endemic to blowouts in sparsely vegetated, shifting sand dunes. The removal of fire, leveling of dunes, reduction of grazing, and cultivation of stabilizing cover crops drastically reduced the amount of habitat available for this species. Loss of habitat, coupled with impacts from insect outbreaks, drought, inbreeding, and potential over collection, has caused problems for the plant (University of Wyoming 2009). Additional threats to the plant may occur when sand dunes are removed or overly disturbed by vehicular traffic (USFWS 2008).

The current stronghold for this species is in western Nebraska. Approximately 3,500-5,000 plants are currently found in multiple locations in that region. The plant was first discovered in Wyoming in 1877 and then rediscovered in 1996 (BLM 2008). The Wyoming population is limited to three sites in the Ferris dunes in northern Carbon County that contain several thousand plants (BLM 2008); those dunes are more than 225 miles southwest of the general analysis area.

Biology and Habitat Requirements

The blowout penstemon is a perennial forb with stems less than 12 inches tall. The inflorescence is 2 to 6 inches long and has 6 to 10 compact whorls of milky-blue to pale lavender flowers. Flowers typically bloom from mid-June to early-July.

This species requires an early succession habitat in sand blowouts. The plant's current know range in Wyoming is restricted to two habitat types: steep, northwest-facing slopes of active sand dunes with less than 5% vegetative cover; and on north-facing sandy slopes, on the lee side of active blowouts with 25% to 40% vegetative cover (USFWS 2008).

Affected Environment

The general analysis area is not within the documented historical range of the blowout penstemon in Wyoming. That area is located approximately 170 miles northwest of the known Nebraska sites and approximately 225 miles northeast of the Wyoming occurrences.

Approximately 16% (455 acres) of the general analysis area is identified as Sandy Prairie Grassland and potentially would contain sand dune and blowout features. Portions of the general analysis area are moderately grazed by livestock and some areas have infestations of weedy species such as Canada thistle.

Results of targeted surveys determined that no suitable blowout penstemon habitat is present in the general analysis area; no sand dunes (whether stable or blown out) are currently present in that area. Likewise, no blowout penstemon specimens were found in any of the seven potential sites surveyed in 2009 or 2010. The general analysis area is dominated (71%) by upland grasslands and agricultural lands. The graminoid-dominated Sandy Prairie uplands provide significant ground cover that precludes the development of shifting dune features. The soils in the surveyed sites are stable and no blowout features are present. Blowout penstemon remained undetected in southwest Wyoming for many years. This species can potentially remain dormant below ground for several years and thus be undetectable during surveys. However, given the results from multiple survey years and the existing habitat conditions, the probability appears extremely low that this species is present within the general analysis area.

Environmental Consequences

Mining the federal coal reserves under the Proposed Action or Alternative 2 would have no effect on the blowout penstemon.

No specimens of blowout penstemon were found during surveys conducted in the study area from 2008 through 2010. Typical suitable habitat for this species is non-existent in the general analysis area, which makes it highly unlikely that populations have gone undetected. However, should such populations be present, they could be lost to surface disturbing activities if appropriate habitat were disturbed. Any potential habitat that has not already been surveyed for blowout penstemon within the project area should be identified and surveyed prior to surface mining activities.

The potential habitat where blowout penstemon could occur within the general analysis area is extremely limited and typically not suitable for the key reasons listed below.

- The sites present with either dune-like or blowout features within the general analysis area are extremely limited in size, typically less than 0.1 acre.
- The Sandy Prairie Grassland is dominated by graminoid species which provide substantial ground cover and soil stability.
- Graminoid species typically occur in a more advanced successional and site transitional state than blowout penstemon, which is a pioneering species.

Based on the existing characteristics of the general analysis area, further evaluation of the area for this species is likely unwarranted.

Cumulative Effects

This species is potentially vulnerable to habitat loss and degradation resulting from sand mining, water development, energy development, residential development, ORV use, and associated destabilization of its sand dune habitat. It also could be vulnerable to negative effects related to the spread of non-native species within its range. As no potential habitat for this species is present within the general analysis area, leasing the federal coal reserves would not contribute to cumulative adverse effects for the blowout penstemon.

Threatened Species

Ute Ladies'-Tresses (Spiranthes diluvialis)

The Ute ladies'-tresses, a member of the orchid family, was listed as threatened on January 17, 1992, due to a variety of factors, including habitat loss and modification, hydrological modifications of existing and potential habitat areas, and invasion of exotic plant species. At the time of listing, this species was only known from Colorado, Utah, and extreme eastern Nevada. Ute ladies'-tresses were discovered in Wyoming in 1993. It is currently known from western Nebraska, eastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central and southeastern Idaho, southwestern Montana, and central Washington.

Biology and Habitat Requirements

The Ute ladies'-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 8 to 20 inches tall arising from tuberous-thickened roots. In Wyoming, this species typically blooms from late July or early August to early September, with fruits produced from mid-August to September (Fertig 2000). Ute ladies'-tresses can only be reliably located and positively identified when they are flowering (Heidel 2001). The flowers are white or ivory and clustered into a spike at the top of the stem; however, depending on location and climatic conditions, it may bloom in early July or still be in flower as late as early October (Heidel 2007). Plants probably do not flower every year and may remain dormant below ground during drought years. In general, the species' best flowering years seem to correspond with extreme heat during flowering. Preliminary review of climate data also indicates that growing seasons that start out as relatively cold and wet correspond with low flowering levels (Heidel 2001).

The Ute ladies'-tresses occurs primarily in areas where vegetation is relatively open and not overly dense, overgrown, or heavily over-grazed. It is commonly associated with horsetail, milkweed, verbena, blue-eyed grass, reedgrass, goldenrod, bentgrass and arrowgrass. Wyoming populations often occur in moist meadow communities dominated by redtop, common quackgrass, Baltic rush, foxtail barley, or switchgrass within a narrow vegetative band between emergent aquatic vegetation and dry upland prairie (Fertig 2000). Vegetative cover tends to range from 75% to 90% and is usually less than 45 centimeters tall (Fertig 2000). However, the orchid seems intolerant of shade and is usually found as small scattered groups that occupy relatively small areas of open vegetation within the riparian system.

The total known number of individuals of this species is currently estimated to be 83,000 individuals (Fertig et al. 2005). Occurrences range in size from one plant to a few hundred individuals. Prior to 2005, four orchid populations had been documented within Wyoming, all discovered between 1993 and 1997 (Fertig and Beauvais 1999). Four additional sites were located in 2005 and one additional site was found in 2006 (Heidel 2007). The new locations were in the same drainages or tributaries as the original four populations. Drainages with documented orchid populations include Antelope Creek and tributaries in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County.

Populations are often dynamic and "move" within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). The orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances, such as grazing, that are common to grassland riparian habitats (USFWS 1995). Ute ladies'-tresses colonize early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbley edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season. Soils where the orchid has been found typically range from fine alluvial silt/sand to gravels and cobbles, as well as in highly organic and peaty soil types, or whitish loamy clay with a slightly basic pH. The orchid can also become established in heavily disturbed sites, such as revegetated gravel pits, heavily grazed riparian edges, and along well-traveled foot trails on old berms (USFWS 1995). This species is not found in heavy or tight clay soils or in extremely saline or alkaline soils.

Affected Environment

The general analysis area is not within the documented range of the Ute ladies'-tresses in Wyoming; no occurrences have been recorded in Campbell County. The nearest documented record of Ute ladies'-tresses is the Antelope Creek population, approximately 70 miles southwest of the general analysis area. Most of the potentially suitable habitat in the general analysis area is found along Hay Creek. This primary drainage, which flows generally from west to east through the northern portion of the general analysis area, is classified as an ephemeral stream in this area. Limited portions of Hay Creek and its tributary drainages may receive recharge from bank storage making them locally intermittent. In response to recent surface discharge of groundwater associated with CBNG development on or upstream of the general analysis area, streamflow occurrence is now more persistent and some drainage channels are seldom completely dry.

Several unnamed and named ephemeral tributaries drain portions of the general analysis area though, as described above. Only one drainage intersects the proposed tract itself; that drainage does not connect with Hay Creek. One small (0.24 acre) impoundment is present in the northwestern corner of the proposed tract, with additional stock reservoirs present elsewhere in the general analysis area. The stock reservoirs are constructed as earthen berms or dams located on these ephemeral drainages. These ponds generally contain water only in early spring, then dry up in summer.

Environmental Consequences

Mining the federal coal under the Proposed Action or Alternative 2 will have no effect on Ute ladies'-tresses.

No Ute ladies'-tresses were located during surveys conducted in appropriate habitats within the general analysis area in 2004 or annually from 2006 through 2010 (LandTrak Resources 2009, 2011). No potential habitat for this species is present within the proposed tract. Previous wetland inventories identified a total of 6.71 acres of nonjurisdictional wetlands and 1.33 acres of other waters of the U.S. within or directly adjacent to Hay Creek as it flows through the overlap between the existing Buckskin Mine permit area and the general analysis area. However, most of these features have already been excavated for the extraction of coal reserves as part of the current Buckskin Mine permit, or are already permitted for disturbance due to their location within the existing permit area. Additionally, coal reserves under and within 100 feet of the Collins and McGee roads, and within 300 feet of an occupied residence, are considered "unsuitable for mining" under BLM coal unsuitability criterion 3. Because Kiewit has not applied to relocate either road and does not intend to obtain surface rights for the occupied residence, the lands between the two roads and west of the Collins Road are operationally blocked from mining. Consequently, no new potential Ute ladies'-tresses habitat has been added by the Proposed Action or Alternative 2 that is not already approved for disturbance.

Because this species can persist below or above ground without flowering, single season surveys that meet the current USFWS survey guidelines may not detect populations; surveys in the general analysis area have been conducted during the last five consecutive flowering seasons (2006 through 2010).

Potential habitat for Ute ladies'-tresses is extremely limited within the general analysis area and typically is not suitable for this species for a number of key reasons:

- Wet meadow habitat types typically support aggressive rhizomatous graminoid plant species. These potential habitat sites are well-established plant communities that typically have dense under-story cover. This orchid normally does not grow in such conditions.
- Soils trend from moderately to very saline/sodic. A number of the potential habitat sites have visible saline/sodic crusts. Inland saltgrass and foxtail barley are often the only species growing in these areas.
- CBNG dewatering and treatment activities have caused major impacts to all of the watersheds within the proposed amendment area. Areas that have been historically wet are now dry, and new areas are now wet where CBNG waters are discharged/treated. The historic groundwater and soil moisture conditions have been altered or disrupted and major shifts in plant community distribution have occurred or are occurring.
- Livestock grazing has impacted the quality of riparian areas. Livestock use during the wetter times of the year adversely impacts potential Ute ladies'-tresses habitat.

Stormwater runoff varies considerably from year to year. A reliable supply of surface water is not always available during the middle and late summer to support late growth plant species. This serves to further limit the presence of potential Ute ladies'-tresses habitat within the general analysis area; the quality of potential habitats is extremely poor.

Any jurisdictional wetlands that are destroyed by mining operations would be replaced in accordance with the requirements of Section 404 of the Clean Water Act, as determined by the Corps. The replaced wetlands may not duplicate the exact function and landscape features of the premine wetlands. The Corps considers the type and function of each jurisdictional wetland that will be impacted and may require restoration of additional acres if the type and function of the restored wetlands will not completely replace those of the original wetlands. Replacement of nonjurisdictional and functional wetlands may be required by the surface land owner and/or WDEQ. That agency allows and sometimes requires mitigation of nonjurisdictional wetlands affected by mining, depending on the values associated with the wetland features. The WDEQ also requires replacement of playas with hydrologic significance.

Cumulative Effects

Alterations of stream morphology and hydrology are believed to have extirpated Ute ladies'-tresses from most of its historical range (USFWS 1995). Disturbance and reclamation of streams by surface coal mining may alter stream morphology and hydrology. The large quantities of water produced with CBNG development and discharged on the surface may also alter stream morphology and hydrology. However, no typical suitable habitat for Ute ladies'-tresses is present within the proposed tract. Additionally, no orchids have been documented during repeated surveys of typical suitable habitat in the portion of the Hay Creek drainage included in the BLM study area. Furthermore, nearly the entire Hay Creek drainage under that alternative has already been approved for disturbance, and most of that disturbance has already occurred. The remaining drainage reach that may provide typical suitable habitat for this species is within one or more areas designated as unsuitable for mining. Therefore, leasing the federal coal reserves is not likely to contribute to cumulative adverse effects for the Ute ladies'-tresses.

Candidate Species

Greater Sage-grouse (Centrocercus urophasianus)

The sage-grouse was determined to be warranted for listing under the ESA in March 2010, but that listing was precluded by higher priority species. Although the sharp-tailed grouse does not have the same status as sage-grouse, it has been documented at the Buckskin Mine over the years. Surveys for both species are conducted using current agency protocols. Consequently, portions of the following discussion apply to both species. However, because sharp-tailed grouse are not involved in the listing process, no information specific to that species is provided in this appendix.

Sage-Grouse Life History

The sage-grouse is considered a "landscape species," which means that large expanses of unfragmented land are required to provide all the habitat components necessary for their annual life cycle. This species is a sagebrush-obligate, and requires sagebrush habitat year-round for food, cover, and shelter, and for every phase of its life cycle. Sage-grouse often exhibit seasonal movements to use discrete sagebrush habitats, though the distance traveled varies widely among populations. These movements are often in response to devotion to seasonal-use areas (i.e., breeding, nesting/brood rearing, summering, and wintering), with adjustments related to severity of winter weather, topography, and vegetative cover.

Sage-grouse breeding occurs on leks during late March and April. Leks are generally established in open areas surrounded by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), which is used for escape cover and protection from predators. Generally, lek sites are used year after year and are considered the center of year-round activity for resident sage-grouse populations. On average, approximately two-thirds of sage-grouse hens nest within 3 miles of the lek where they were bred. New spring plant growth, residual cover, and understory are important habitat components for nesting sage-grouse hens.

Areas near nests are used for several weeks by hens for brood rearing. The habitats used during the first few weeks after hatching must provide both good cover to conceal the chicks and essential nutritional requirements during this period of rapid development. Brood-rearing habitats that have a healthy and wide diversity of plant species, particularly grasses and forbs, tend to provide the variety and abundance of insects that are an essential protein supply for the young birds.

Summer habitat consists of sagebrush mixed with areas of wet meadows, riparian, or irrigated agricultural fields. As summer progresses and forbs mature and dry up, sage-grouse broods must move to more mesic or wet meadow-type habitats where succulent plants and insects are still available. This can be especially important in drier years and during extended periods of drought. As the fall season nears, sage-grouse form flocks as brood groups come together. As fall progresses, sage-grouse move toward their winter ranges.

During winter, sage-grouse feed almost exclusively on sagebrush leaves and buds. Suitable winter habitat requires sagebrush to be accessible, especially in areas where snowfall is common. It is crucial that sagebrush be exposed at least 10 to 12 inches above snow level, as this provides food and cover for wintering sage-grouse. Population and habitat analyses suggest that wintering habitat can be as limiting as breeding habitats.

Regional and Statewide Sage-Grouse Population Trends

Overall, the sage-grouse population has been steadily declining in Wyoming and across the rest of the West. A study prepared by the Western Association of Fish and Wildlife Agencies estimated that sage-grouse populations in western North America declined at an overall rate of 2% per year from 1965 to 2003 (Connelly et al. 2004). The decline rate was greater from 1965 to 1985, with populations stabilizing and some increasing from 1986 to 2003. For Wyoming,

this study estimated that sage-grouse populations declined at an average rate of 0.51% per year from 1968 to 1986 (9.66% decline overall), and at an average rate of 0.33% per year from 1987 to 2003. Populations were lowest in the mid-1990s, with a gradual increase in numbers in some regions since that time (Connelly et al. 2004).

The general analysis area is within the Northeast Wyoming Local Sage-Grouse Working Group (NWLSWG) area, which includes portions of the WGFD Sheridan and Casper biological regions. Because the nearest USDA Forest Service lands are approximately 50 miles north and south of the general analysis area, this EIS does not include lek trends from the Thunder Basin National Grasslands. Results from that area are discussed in both the *South Gillette Coal Lease Application Final EIS* and the *Wright Area Coal Lease Application Draft EIS*, available on the Wyoming BLM website.

Sage-grouse monitoring has occurred in the NWLSWG area since 1967. Assuming the number of males per active lek accurately reflects sage-grouse populations, population trends have exhibited a cyclical pattern within this area. Periodic highs and lows in grouse numbers have occurred at approximately 10-year intervals (figure J-1). With the exception of the most recent cycle, each successive peak was lower than the preceding peak; the same was true for successive low counts. This long-term trend suggests a steadily declining sage-grouse population (WGFD 2008a).

Comparisons between sage-grouse population trends in the NWLSWG area and statewide (figure J-2) show strong similarities, though the average number of males per lek in the regional area has been lower than that observed statewide in most years. As in the NWLSWG area, the statewide sage-grouse population trend has exhibited a long-term (1960–2008) decline, a mid-term (1999–2008) increase, and a recent short-term (2006–2008) decline (WGFD 2008b). The mid- and short-term trends in statewide populations are believed to be largely weather related. Timely precipitation in some years resulted in improved habitat conditions, allowing greater numbers of sage-grouse to hatch and survive. Conversely, multi-year drought conditions are believed to have caused lower grouse survival in the early 2000s, leading to population declines.

The WGFD considers these trends as valid at the statewide scale, but more varied at the local scale (WGFD 2008b). For example, sub-populations in areas more heavily influenced by anthropogenic impacts (e.g., subdivisions, intensive energy development, large-scale conversion of habitat from sagebrush to grassland or agriculture, interstate highways) have experienced declining populations or extirpation despite recent population increases in other parts of the state (WGFD 2008b). The potential for West Nile virus, as well as loss of population connectivity, represent additional threats to this species in many parts of its range (Naugle et al. 2004).

Agency Responses to Sage-Grouse Population Trends

Since 1999, the USFWS has received eight petitions requesting that the sage-grouse be listed under the ESA as threatened or endangered. Three of the petitions requested that sage-grouse be listed as endangered across its entire range. On January 12, 2005, following a 12-month status

review on the species, the USFWS concluded that listing was not warranted at that time. On December 4, 2007, U.S. District Court, District of Idaho, ruled that the USFWS 12-month petition finding on sage-grouse was in error and remanded the case back to the agency for further reconsideration. On February 26, 2008, the USFWS announced the initiation of another status review for the sage-grouse. That review process concluded on March 5, 2010, when the agency determined that listing the sage-grouse under the ESA was "warranted, but precluded" by other higher priorities; that determination has since received legal challenges by various groups.

In response to these repeated petitions and the most recent determination regarding listing under the ESA, the USFWS has indicated the need for increased and continued efforts to conserve sage-grouse and sagebrush habitat on a long-term basis. That agency has encouraged continued development and implementation of conservation strategies throughout the species' range. In May 2002, the USFWS office in Cheyenne, Wyoming, released a list entitled "Coal Mine List of 40 Migratory Bird Species of Management Concern in Wyoming," which replaced the previous "Migratory Birds of High Federal Interest List." The sage-grouse is included as a Level I species on the updated list, which indicates the need for a monitoring and mitigation plan for this

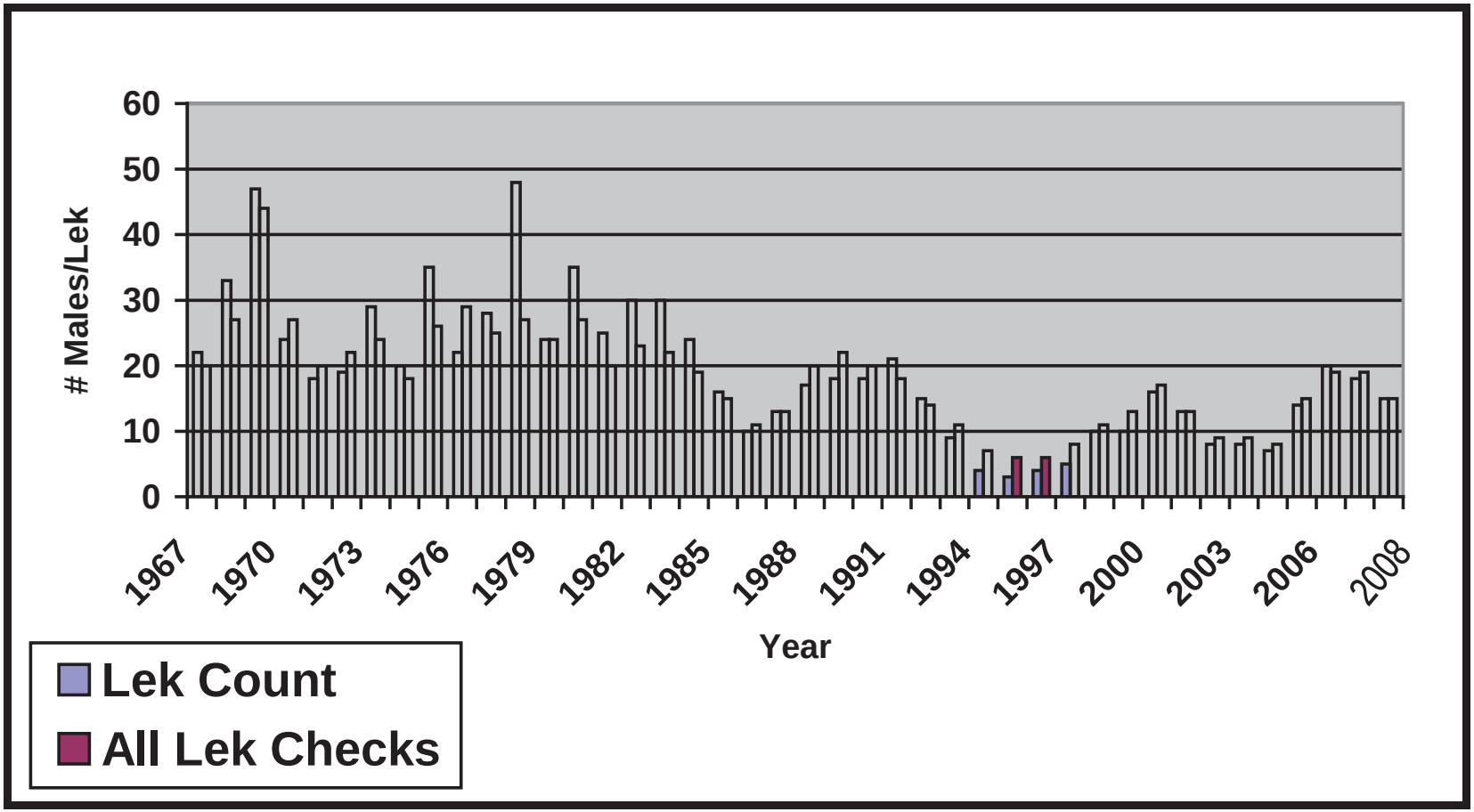
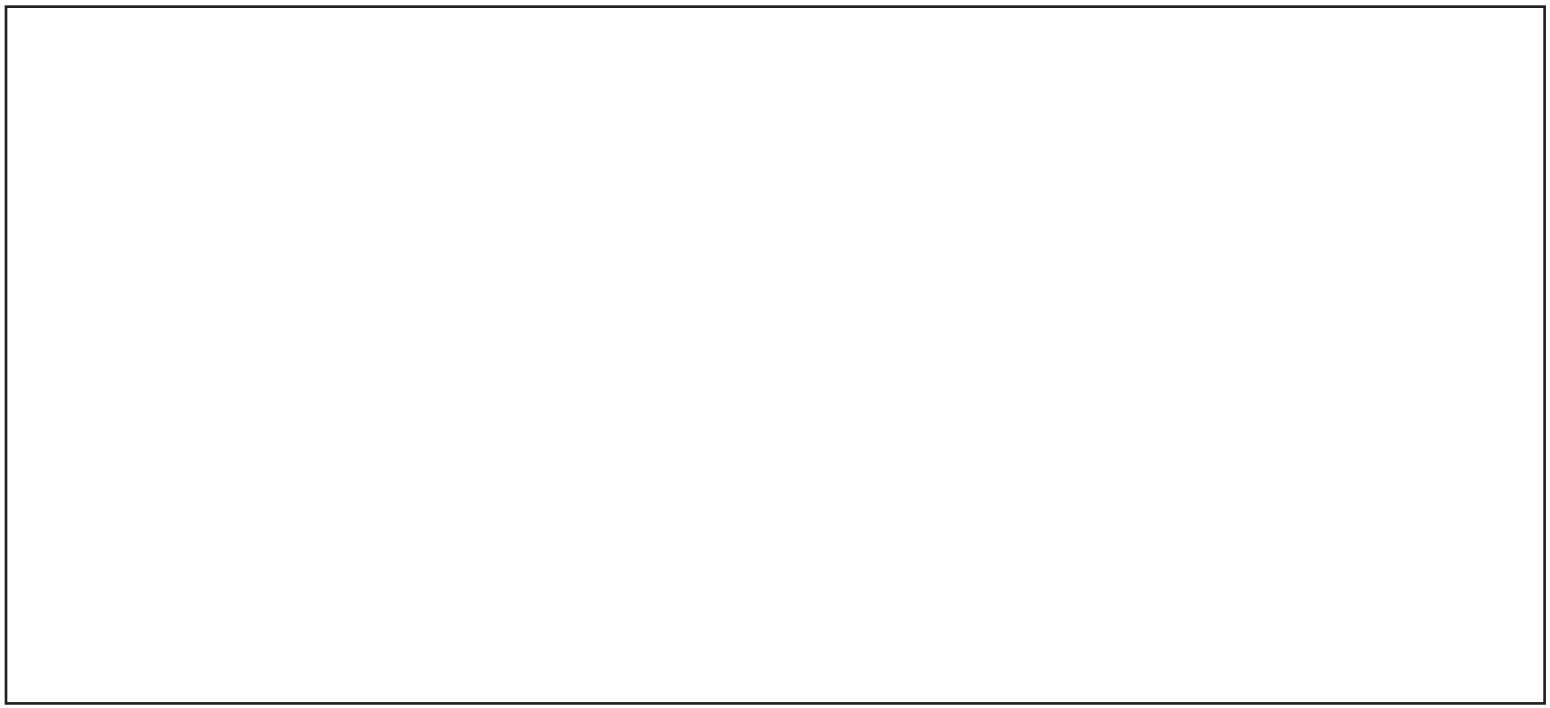


Figure J-1

Average Male Sage-grouse Lek Attendance within the Northeast Wyoming Local Working Group Area (1967–2008)



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Figure J-2

Average Number of Males per Lek Counted in Wyoming (1960–2008) with a Minimum of 100 Leks Checked Each Year

species. Although the sage-grouse continues to be managed by the WGFD, its current status as a candidate species under the ESA gives further impetus to ongoing annual monitoring efforts. The sage-grouse is also a BLM sensitive species (see appendix K) due to its recurring presence in the federal listing process.

On September 11, 2003, the Wyoming Game and Fish Commission announced that the 2003 hunting season for sage-grouse in Johnson, Sheridan, and Campbell counties would be closed. The closure followed the deaths of 11 sage-grouse in northeastern Wyoming from West Nile virus in August and early September of that year. According to WGFD's September 11, 2003, press release, the commission took this action because the incidence of infection was much higher in northeastern Wyoming than in the rest of the state, and the area is on the fringe of sage-grouse range with marginal, fragmented habitat. Recent lek count data indicate that Wyoming's sage-grouse populations increased slightly from 2004 through 2007. Lower incidences of West Nile Virus mortalities were also documented in those years, primarily due to cooler temperatures that reduced mosquito populations. Sage-grouse hunting seasons were reopened in 2004 (Christiansen 2004).

In 2007, Wyoming Governor Dave Freudenthal commissioned a Statewide Sage-grouse Implementation Team, which emerged from the Governor's 2007 Sage-Grouse Summit. On March 17, 2008, the implementation team preliminarily identified and mapped recommended sage-grouse core breeding areas in Wyoming in an effort to better understand the types of habitat grouse prefer and what areas should be protected. No such habitat was defined in the vicinity of the general analysis area for the Hay Creek II LBA.

On August 1, 2008, the Governor of Wyoming released an executive order regarding sage-grouse core area protection on state trust lands. The sage-grouse core area protection concept came about because of work by the Sage-Grouse Implementation Team. The implementation team developed a core population strategy for the state "to maintain habitats and viable populations of sage-grouse in areas where they are most abundant." As part of that effort, the team delineated approximately 40 areas of state trust lands around Wyoming with a goal of maintenance and enhancement of grouse habitats and populations within the core areas. The areas were delineated by evaluating habitats within a 4-mile radius of selected sage-grouse leks in high lek-density areas. The Implementation Team is currently working with the Local Sage-grouse Working Groups throughout Wyoming to revise those core areas to include lands within 5.3 miles of selected sage-grouse leks to increase protection for nesting hens, and to identify and protect other important habitats that might help maintain connectivity among populations. Revised maps and management recommendations are expected to be released in the latter half of 2010.

The BLM Wyoming State Office is also in the process of developing a statewide sage-grouse management policy and has incorporated sage-grouse focus areas based on the core area concept in its draft management policy. The BLM has indicated that the sage-grouse management strategy for future surface disturbance, which would include the Proposed Action and alternatives, will likely be based on its sage-grouse focus areas.

Affected Environment

Based on results from annual counts and lek searches conducted for the Buckskin Mine, sage-grouse occur but are not abundant in the general analysis area. In general, sharp-tailed grouse do not appear to be as prevalent as sage-grouse near the surface coal mines in northeast Wyoming. However, sharp-tailed grouse have been seen in greater numbers and with more frequency than sage-grouse in the general analysis area in recent years, though counts for both species have declined over time (table J-3).

Table J-3. Peak Grouse Attendance at Leks in the Vicinity of Buckskin Mine (1984–2010)

	Daly SAGR		Hay Creek SAGR*[1]		McGee SAGR[2]		Stickel STGR*		McGee I STGR		McGee II STGR*		McGee III STGR**	
Year	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1984	20	1	2	U	—	—	—	—	—	—	—	—	—	—
1985	20	4	8	U	—	—	—	—	—	—	—	—	—	—
1986	12	0	12	U	—	—	—	—	—	—	—	—	—	—
1987	10	0	23	U	—	—	—	—	—	—	—	—	—	—
1988	17	0	27	U	—	—	—	—	—	—	—	—	—	—
1989	16	5	15	1	—	—	—	—	—	—	—	—	—	—
1990	9	1	12	1	—	—	—	—	—	—	—	—	—	—
1991	10	1	17	0	—	—	—	—	—	—	—	—	—	—
1992	7	1	20	5	—	—	—	—	—	—	—	—	—	—
1993	0	0	U	U	—	—	—	—	—	—	—	—	—	—
1994	0	0	U	U	—	—	—	—	—	—	—	—	—	—
1995	0	0	0	0	—	—	—	—	—	—	—	—	—	—
1996	0	0	0	0	—	—	—	—	—	—	—	—	—	—
1997	0	0	0	0	—	—	—	—	—	—	—	—	—	—
1998	0	0	0	0	—	—	—	—	—	—	—	—	—	—
1999	0	0	0	0	—	—	—	—	5	0	—	—	—	—
2000	0	0	0	0	—	—	13	1	8	0	—	—	—	—
2001	0	0	2	3	6	2	9	3	4	0	—	—	—	—
2002	0[3]	0	0	0	0	0	3	0	0	0	13	5	—	—
2003	0	0	0	0	1	3	0	0	0	0	8	1	—	—
2004	0	0	0	0	3	0	0	0	0	0	2	0	—	—
2005	0	0	0	0	0	0	0	0	0	0	0	0	4[4]	0
2006	0	0	0	0	U	U	0	0	0	0	0	0	0	0
2007	0	0	U	U	U	U	U	U	0	0	0	0	0	0
2008	0	0	0	0	0	0	U	U	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mgt. Status[5]	Abandoned		Occupied		Occupied		Occupied		Occupied		Occupied		Occupied	

M= Male; F = Female; SAGR = sage-grouse; STGR = sharp-tailed grouse; U = Unknown, inaccessible due to mining; --- = lek undiscovered

* In the Buckskin Mine permit area.

** In the general analysis area.

[1] The lek was beyond the required annual monitoring area until 2002 but was checked at least once in most years.

[2] The lek is beyond the required annual monitoring area; data presented is from the 2009 WGFD lek database.

[3] Two displaying males were seen once approximately 1,000 feet south of the historic lek site. The birds were presumed to have flown in from another lek located 2.0 miles south of the Daly lek site.

[4] Birds were not displaying; number of males and females unknown.

[5] Management status based on WGFD (2010) classifications.

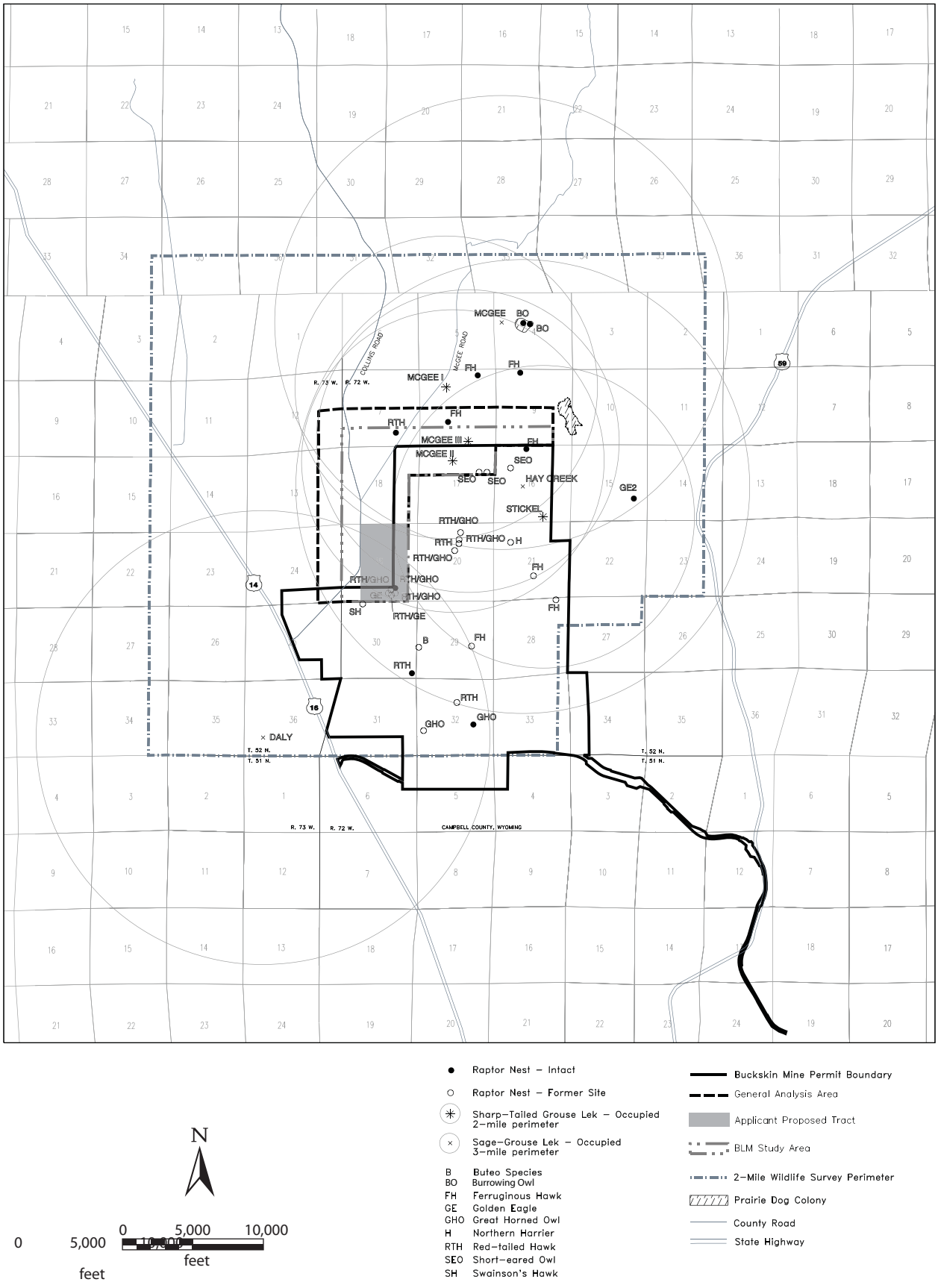
Three sage-grouse lek sites have been documented at the Buckskin Mine over the last 27 years of annual monitoring (table J-3); none of these sites is within the general analysis area (map J-3). The Daly sage-grouse lek has been inactive for the last 17 consecutive years and is considered abandoned by the WGFD. The remaining two leks have also been inactive in recent years, but are still classified as occupied. The Hay Creek lek is within the existing Buckskin Mine permit area, approximately 0.5 mile southeast of the general analysis area. This site has been or will be affected by previously permitted disturbance in the permit area. The McGee sage-grouse lek is approximately 1.25 miles north of the general analysis area, and the abandoned Daly lek site is approximately 0.75 mile west of the permit area and on the far side of U.S. Highway 14-16.

The Daly sage-grouse lek has been monitored annually since 1984 (table J-3). The greatest number of males recorded there was 20 in both 1984 and 1985. Peak male counts vacillated over the next seven years, but attendance gradually declined through 1992. No grouse were observed at the lek itself from 1993 through 2010. Two males were seen displaying approximately 1,000 feet south of the historic Daly lek site on one occasion in late April 2002, but no grouse were recorded in that area during any subsequent surveys. Those two birds were presumed to have flushed from an active lek site approximately 2 miles south of the Daly lek.

The Hay Creek sage-grouse lek is located in the northeastern corner of the existing Buckskin Mine permit area. The lek was active every year from 1984 through 1992, with a peak count of 27 males in 1988. The site was not visited in 1993 or 1994, but no birds were observed during periodic checks from 1995 through 2000. Through 2000, the lek site was beyond the required annual monitoring area (existing permit boundary and 1-mile radius) for the Buckskin Mine; the mine surveyed the lek voluntarily during this period. Annual monitoring of the Hay Creek lek resumed from 2001 through 2010, except in 2007; the lek was not accessible that year due to mine operations. Two displaying males and three hens were seen at the lek on one morning in 2001, but no grouse were present during additional checks that year, or in subsequent monitoring years.

The McGee sage-grouse lek is located beyond the required annual monitoring area for the Buckskin Mine and, therefore, is not included in that monitoring program. A WGFD biologist first recorded the lek in 2001. Biologists with that agency monitored the lek each year through 2005 and again in 2008; surveys were conducted by independent biologists in 2009 and 2010. The peak male count during that period was the original six birds discovered in 2001. No birds were seen at the McGee sage-grouse lek during five of the eight survey years, though the landowner reported birds present there in 2008 (the WGFD count was zero during three separate counts that year).

No grouse nests or broods for either species have been encountered in the general analysis area during targeted surveys or incidental to surveys conducted for other species. No sage-grouse have been observed during winter, though site visits occur less often at that time of year.



No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by BLM.

Map 3.10-1

Raptor Nests, Prarie Dog Colonies, and Grouse Leks in the Wildlife Survey Area

As described in section 3.10.1, sagebrush habitat is limited to 302 noncontiguous acres in the general analysis area (including 46 noncontiguous acres in the proposed tract) with average patch size of 4.9 acres. These acreages represent less than 11% of the total vegetative cover for each area. Water sources in the general analysis area are limited to the diverted channel of the ephemeral drainage of Hay Creek, two small impoundments, and a playa. Of those, only one small impoundment is present in the proposed tract itself. All water bodies are seasonal, with water typically present in spring but dry by mid- to late summer.

Environmental Consequences

Given the dominant vegetation types in the general analysis area (upland grasslands and agricultural fields) and the lack of regular sightings over the last 27 years of monitoring, especially outside the breeding season, it is unlikely that the sage-grouse is a yearlong resident in the general analysis area. The WGFD stated in a letter to the BLM, dated May 6, 2010, that it has no concerns about terrestrial wildlife, including sage-grouse, pertaining to the Hay Creek II LBA coal lease application.

Proposed Action

Under the Proposed Action, surface coal mining in the proposed tract (419 acres) and mine-related activities in the support area (241 acres) would have no physical impact on grouse leks (map J-3). This alternative would have a minor, long-term impact on approximately 46 non-contiguous acres of potential sage-grouse nesting habitat (sagebrush) in these areas. Activities in the remainder of the overlap area (474 acres) related to mining existing coal leases also would have no impact on sage-grouse leks, but would have a minor, long-term impact on approximately 80 non-contiguous acres of potential sage-grouse nesting habitat (sagebrush). Ongoing impacts on potential upland game bird habitats from current facilities and mining techniques would be the same as those described above under "Affected Environment," but would continue for two years beyond the current life-of-mine estimate.

No grouse leks, nests, broods, or other signs of use (feathers, droppings, and snow tracks) have been documented within the proposed tract during the last 27 years of monitoring. The proposed tract, support area, and overlap area do not provide any unique habitat for sage-grouse. This combined area is dominated (71%) by upland grasslands. Sagebrush occurs on approximately 126 non-contiguous acres, with an average patch size of 4.9 acres. Impacts from mine-related noise would be minor and short-term due to the presence of natural buffers between mine activities and lek sites, and the temporary and incremental presence of operations in any given location.

Because the proposed tract is dominated by upland grasslands, the establishment of reclaimed grassland communities after mining has been completed would not result in a dramatic change in habitat types from the premining conditions. Some evidence has been documented that sage-grouse do repopulate areas after reclaimed shrublands have become established, but that process may take decades (Braun 1998). Estimates for the time it would take to restore shrubs, including sagebrush, to premine density levels range from 20 to 100 years, which may delay sage-grouse

repopulation in the reclaimed areas. Once they do return to an area, sage-grouse populations do not appear to attain their previous levels.

Alternative 1 (No Action)

Under the No Action Alternative, the coal lease application would be rejected and no new coal reserves would be mined in the general analysis area. Activities in the overlap area (656 acres) related to mining existing coal leases would have no physical impact on any sage-grouse leks (map J-3), but would have a minor, long-term impact on approximately 86 non-contiguous acres of potential sage-grouse nesting habitat (sagebrush). Other factors associated with this species and its habitat would be the same as those described under the Proposed Action. A decision to reject the coal lease application would not preclude an application to lease a tract in the general analysis area in the future.

No sage-grouse leks are present in the general analysis area, but one site is located approximately 0.5 mile southeast of that area, within the existing mine permit area (map J-3). That lek site has not yet been physically disturbed, but mine operations have been ongoing within 700 feet of the lek in recent years. No sage-grouse nests or broods have been documented in the overlap area between the general analysis area and existing permit boundary, nor have grouse been observed in the overlap area during winter.

As described under the Proposed Action, the overlap area does not provide any unique habitat for the sage-grouse. The area is dominated by upland grasslands, with sagebrush occurring in small patches scattered across approximately 86 noncontiguous acres. Therefore, the establishment of reclaimed grassland communities after mining has been completed would not result in a dramatic change in habitat types from the premining landscape.

Alternative 2

Under Alternative 2, surface coal mining in the BLM study area (up to 1,883 acres) and mine-related activities in the support area (926 acres) would have no impact on sage-grouse leks (map J-3), but would have a minor long-term impact on approximately 302 non-contiguous acres of potential sage-grouse nesting habitat (sagebrush). Activities in the remainder of the overlap area (38 acres) related to mining existing coal leases would have no impact on sage-grouse leks or sagebrush. Impacts from mine-related noise on leks beyond the general analysis area would be minor and short-term due to the presence of natural buffers between mine activities and lek sites, and the temporary and incremental presence of operations in any given location. Impacts on known and potential upland game bird habitats from current facilities and mining techniques would be the same as those described above under the Proposed Action, but would continue for up to six years beyond the current life-of-mine estimate.

No sage-grouse leks occur within the general analysis area (map J-3). The nearest sage-grouse lek (Hay Creek) is within the existing permit area approximately 0.5 mile to the southeast and, thus, is already subject to disturbance from previously permitted activities. The McGee sage-grouse lek is on private surface approximately 1.25 miles north of the general analysis area. That site is on the far side of multiple ridges that provide a visual and audio buffer, and it is not likely

to be affected by mine operations. Sage-grouse were last observed at the Hay Creek lek in 2001 and the McGee lek in 2004; both are considered occupied by the WGFD.

Disturbance and reclamation activities would be temporary and occur incrementally throughout the general analysis area. If mining activities disturb an active lek, grouse would have to use an alternate site or establish a new lek for breeding activities.

In addition to lek sites, areas of suitable habitat for nesting and other seasonal needs are necessary to sustain sage-grouse populations. One recent study suggests that availability of winter habitat can also affect sage-grouse populations (Naugle et al. 2006). The general analysis area is dominated (71% of total cover) by upland grasslands and agricultural fields, which do not provide the necessary shrub communities for forage and cover. Sagebrush in that area is limited to 302 noncontiguous acres, with an average patch size of approximately 4.9 acres. No grouse nests or broods have been documented in the general analysis area, nor have grouse been observed there during winter. Additionally, the general analysis area is not included in or within several miles of either a state sage-grouse core area or BLM sage-grouse focus area, though that does not preclude the need for grouse management when they are present.

The general analysis area does not provide any unique habitat for sage-grouse, and future mine operations would affect existing and potential habitat to varying degrees. As described previously, the prevalence of upland grasslands and the limited presence of surface water reduce the area's value to sagebrush obligates such as the sage-grouse.

Leasing, mining, and reclaiming a tract within the general analysis area would result in permanent alterations in the topography and long-term changes in vegetative composition from premine conditions. Because the general analysis area is dominated (71%) by upland grassland communities and agricultural lands, the establishment of reclaimed grassland communities after mining has been completed would represent similar or somewhat improved wildlife habitats, respectively, compared to those in the premining landscape. Restoration of sagebrush communities that are present could be difficult to accomplish through artificial plantings, and can take decades through natural regeneration. Until sagebrush returns to its premining density, a reduction in potential habitat for wildlife species associated with that habitat would occur in the general analysis area.

Some evidence has been documented that sage-grouse do repopulate areas after reclaimed shrublands have become established, but that process may take decades (Braun 1998). Estimates for the time it would take to restore shrubs, including sagebrush, to premine density levels range from 20 to 100 years, which may delay sage-grouse repopulation in the reclaimed areas. Once they do return to an area, sage-grouse populations do not appear to attain their previous levels. Once they do return to an area, sage-grouse populations have not yet been documented at their previous levels.

Cumulative Effects

Although the lands disturbed by future mining would be reclaimed in accordance with the requirements of SMCRA and Wyoming statutes, some residual wildlife impacts would occur. Areas that currently support sagebrush would be altered to a grassland community, perhaps for decades, during the interim between sage plantings and maturity in reclamation. This would reduce the carrying capacity of the land for shrub-dependent species, though such impacts would be mediated by the limited presence of sagebrush and riparian (brood-rearing) habitats in the general analysis area. Until such habitats have been fully reestablished, transitions from sagebrush to grassland communities would likely result in some changes in wildlife species composition. Shrubland species may repopulate reclaimed areas, but populations may not attain premining levels. As indicated, the limited presence of sagebrush communities in the general analysis area would help minimize such residual impacts.

Proposed Species

Mountain Plover (Charadrius montanus)

The USFWS originally proposed to list the mountain plover as a threatened or endangered species under the ESA in February 1999, and amended that proposal in December 2002. The agency withdrew the listing proposal in September 2003 based on the conclusion that information available at that time did not indicate the threats to the mountain plover and its habitat were likely to endanger the species in the foreseeable future. In June 2010, the USFWS reinstated the 2002 proposed rule to list the mountain plover as a threatened species and invited public comments. As a result of that reinstated proposal, the BLM was required to confer with the USFWS on any action that could jeopardize the continued existence of any species proposed for listing under the ESA.

On May 11, 2011, after a thorough review of all available scientific and commercial information, the USFWS determined that the mountain plover is not threatened or endangered throughout all or a significant portion of its range, including Campbell County, Wyoming, the Hay Creek II general analysis area (76 FR 92). Consequently, this species was removed from the listing process under the ESA. However, due to the timing of that decision, the following discussion of mountain plovers has been retained. Additionally, the mountain plover continues to be protected under the Migratory Bird Treaty Act and as a sensitive species under BLM policy (Bureau Manual 6840.06 E. Sensitive Species). Furthermore, the USFWS encourages project planners to develop and implement protective measures for mountain plovers that occur within their project areas.

Biology and Habitat Requirements

The mountain plover breeds from southeastern Alberta and southwestern Saskatchewan through central Montana, south to south-central Wyoming, east-central Colorado and northeastern New Mexico, and east to northern Texas and western Kansas. In Wyoming, this species is a common summer resident (Cerovski et al. 2004). Mountain plovers require flat grasslands with short and sparse vegetation, and a large bare ground component (Knopf 1996) for nesting, foraging, or

staging. Within the PRB, heavily grazed prairie dog colonies generally provide the most suitable mountain plover habitat.

Mountain plovers are monogamous and possibly polyandrous ground nesters, and typically produce at least two clutches. The nest is a shallow depression occasionally thinly lined with grass. Plovers may utilize the same nesting area in subsequent years (Dechant et al. 2003). Adults and fledged chicks leave the breeding grounds by early August, and may stage within appropriate habitats before migrating. Plovers feed primarily upon insects. Beetles, grasshoppers, crickets, and ants are the most important prey items (Knopf 1996). This species is highly approachable and does not flee far. Mountain plover populations have historically declined, and recent data suggest that this species is continuing to decline in numbers. Causes of population declines have been primarily attributed to regional changes in agricultural practices (Knopf 1996).

Affected Environment

No prairie dog colonies (potential mountain plover habitat) are present within the general analysis area. The upland grasslands that dominate the area lack the specific characteristics (shorter, less dense grasses) typically associated with this species. No mountain plovers have been documented in the general analysis area or at the adjacent Buckskin Mine during the last 27 years (1984 through 2010) of annual monitoring.

Environmental Consequences

No impacts on mountain plovers are anticipated, because this species has never been documented during the last 27 years of annual monitoring conducted for the adjacent Buckskin Mine, or during surveys conducted specifically for the Hay Creek II LBA. The survey area for the Buckskin Mine overlapped varying portions of the general analysis area each year. Additionally, typical suitable habitat (prairie dog colonies or other short and sparse vegetation) for this species is not present in the general analysis area, which makes it highly unlikely that populations have gone undetected during more than two decades of annual searches. However, should this species be present, it could be impacted by surface mining, if appropriate habitat were disturbed.

Cumulative Effects

The lands disturbed by future mining would be reclaimed in accordance with the requirements of SMCRA and Wyoming statutes, though some residual wildlife impacts would occur. Areas that currently support short, sparse vegetation would be transformed to a taller, denser grassland community. This would reduce the carrying capacity of the land for short-grass species, though such impacts would be mediated by the limited presence of such habitats in the general analysis area.

Cumulative Impacts

Cumulative impacts are defined under NEPA as the incremental impacts of past, present, and reasonably foreseeable future actions, including the proposed action, conducted by any entity

(e.g., federal, state, private). Cumulative impacts on threatened and endangered species and their habitats can result from both direct (physical) and indirect factors.

The net acreage of surface disturbance associated with energy-related activities in the Wyoming PRB has been increasing in recent years due to greater energy demands throughout the country and increasing prices for local energy resources. Existing habitat-disturbing activities in the PRB include: surface coal mining; conventional oil and gas development; CBNG development; uranium mining; sand, gravel, and scoria mining; ranching; agriculture; road, railroad, and power plant construction and operation; recreational activities; and housing (rural and urban) and business development. Mining, construction, agricultural activities, and urban development tend to have more intense impacts on fairly localized areas, while ranching, recreational activities, and oil and gas development (conventional and CBNG) tend to be less intensive but spread over larger areas. Oil and gas development and mining activities have requirements for reclamation of disturbed areas as resources are depleted.

Minimal residual impacts on current threatened and endangered, candidate, or proposed plant and animal species would occur, because no such species have ever been recorded in the general analysis area, and because state and federal regulations require reclamation of specific habitats important for these species. In the short term, mine-related activities in newly leased areas could result in the potential loss of individuals due to injuries or mortalities, as well as a reduction in the available habitat for threatened and endangered plant and wildlife species. In the long term, habitats will continue to be impacted, but they are also being and will continue to be restored in several areas as reclamation proceeds. To preclude or minimize future impacts on federally listed species and their habitats, species-specific protective measures included in the current Buckskin Mine permit document would be expanded and updated to include the final tract configuration prior to any surface disturbance associated with a new coal lease.

The BLM is in the process of completing a regional technical study of current and proposed or potential development activity in the PRB to help the agency evaluate the impacts of coal development in that area. The *Powder River Basin Coal Review* consists of three task reports.

- The completed Task 1 reports describe the existing situation through 2003, which reflects the past and present levels of development.
- The updated Task 2 Report defines the past and present activities in the PRB, based on actual levels of development through 2007 and current development estimates available through 2009, and projects reasonably foreseeable development in the Wyoming PRB through 2020 (BLM 2009).
- The Task 3 reports predict the cumulative impacts that could be expected to occur to air, water, socioeconomic, and other resources if the development occurs as projected in the forecast developed under Task 2.

The information about existing development in the following paragraphs is taken from the updated *Powder River Basin Coal Review* Task 2 report (BLM 2009) and BLM lease records. The completed PRB Coal Review reports can be accessed from the BLM Wyoming web site at

http://www.wy.blm.gov/minerals/coal/prb/prbdocs.htm. The project area for Tasks 1 and 2 of the PRB Coal Review encompasses over 8 million acres and includes all of Campbell, Sheridan, and Johnson counties and the northern portion of Converse County in northeastern Wyoming.

Oil and gas exploration and production have been ongoing in the PRB for more than 100 years. Conventional (non-CBNG) oil and gas fields are, for the most part, concentrated in the central and southern parts of the structural basin. Development of the CBNG resources from the coal beds is a more recent occurrence, with CBNG production in the Wyoming PRB starting in the late 1980s. As of 2003, an estimated 187,761 acres had been disturbed in the coal review project area as a result of oil and gas development activities, but approximately 115,045 acres (61%) of that disturbance has been reclaimed. This includes conventional oil and gas and CBNG wells, and associated facilities and major transportation pipelines.

The BLM estimates that the existing federal coal leases in the Wyoming PRB include approximately 121,185 acres. The currently pending federal coal LBA tracts as applied for (including the proposed tract) include approximately 35,245 additional acres. The majority of the coal in the areas currently permitted for surface coal mining is federal, but state and private leases are also included within some of the existing mine permit areas. All of the current and proposed federal coal leases are concentrated near the outcrop of the Wyodak coal bed, which is located in eastern Campbell County and the extreme northeastern edge of Converse County. That bed includes the Anderson and Canyon coal seams that are within the general analysis area.

As of 2007, the updated year for the PRB Coal Review, the surface coal mining operations along the Wyodak outcrop had disturbed approximately 83,593 acres. Approximately 24,338 of those acres of disturbance are occupied by "permanent" mine facilities, such as roads, buildings, coal handling facilities, etc., that are not available for reclamation until after coal mining operations end. Of the remaining 59,255 acres of disturbance available for reclamation, approximately 25,884 acres (44%) had been reclaimed. Reclamation of the balance of 33,371 acres, which represent areas of active mining and areas where coal has been recovered but reclamation has not been completed, would proceed concurrently with coal mining. The *Powder River Basin Coal Review* identified an estimated 5,802 additional acres of coal-related development disturbance (i.e., coal-fired power plants, railroads, and coal technology projects) as of 2007.

The total estimate of disturbed acreage related to all types of development in the Wyoming PRB in 2007 was 222,568 acres. In addition to coal and oil and gas activities, this total includes disturbance associated with construction of reservoirs and industrial fabrication firms, as well as public and private infrastructure such as highways and roads, government buildings, and residential and commercial real estate development. It should be noted that some of these disturbances overlap one another. In such cases, the disturbance acreage is counted separately under each category, but is not counted twice in determining the total area of disturbance. These disturbances do not have the same reclamation requirements as coal and oil and gas industries.

Cumulative effects could also occur to any threatened and endangered plant and wildlife resources present in the area as a result of indirect impacts; no such species have been documented there to date. One factor is the potential import and spread of noxious weeds around

roads and facilities. Noxious weeds have the ability to displace native vegetation and hinder reclamation efforts. Control of noxious weeds is addressed in surface coal mining and reclamation plans. If weed mitigation and preventative procedures are applied to all construction and reclamation practices, the impact of noxious weeds on threatened and endangered plants and wildlife would be minimized.

Of the 222,568 acres of total cumulative disturbance, approximately 113,382 acres (51%) have been reclaimed. The remaining 109,186 acres of disturbance would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements. In reclaimed areas, vegetation cover often differs from undisturbed areas. In the case of surface coal mines, re-established vegetation would be dominated by species mandated in the reclamation seed mixtures (to be approved by WDEQ). The majority of the species in the approved reclamation seed mixtures are native to the area. Nevertheless, reclaimed areas may not recreate the ecosystem functions served by undisturbed vegetation communities and habitats for many years after reseeding has occurred. For example, species composition, shrub cover, and other habitat characteristics are likely to differ from pre-disturbance vegetation communities and habitats due to the extended time-frame typically necessary for mature shrub communities to become reestablished in mined areas. Invasion by noxious weeds and alteration of vegetation in reclaimed areas has the potential to alter threatened and endangered plant and wildlife habitat composition and distribution, depending on the species listed and their habitat requirements.

To date, no currently listed threatened and endangered species have been documented at any surface coal mine in the Wyoming PRB. However, some adverse effects to candidate and proposed species that could occur as a result of existing and potential activities in the PRB would include direct loss of habitat, indirect loss of habitat due to human and equipment disturbance, and habitat fragmentation. As described above, all existing coal mines in the Wyoming PRB have agency-approved monitoring and mitigation plans, as well as species-specific protective measures in place to protect threatened and endangered species, per SMCRA (at 30 CFR 816.97) and Wyoming State regulations. If a maintenance coal tract is leased under one of the action alternatives considered in the Hay Creek II EIS, these permitting requirements would be extended to include mining operations within the new tract, including the development and approval of detailed plans to mine the coal and reclaim the affected areas.

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