

**Appendix G**  
**Biological Assessment**

## **APPENDIX G**

# **Biological Assessment of Threatened, Endangered, Proposed, and Candidate Species for the Atlantic Rim Natural Gas Project**

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## BIOLOGICAL ASSESSMENT

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## **BIOLOGICAL ASSESSMENT**

### **1 Introduction**

This Biological Assessment (BA) discusses the potential effects of the proposed Atlantic Rim Project Area (ARPA) on threatened, endangered, and proposed species pursuant to the Endangered Species Act (ESA) of 1973. Candidate species for listing under the ESA are also discussed. This BA also presents recommendations to ensure that the construction and subsequent operation of the proposed project will neither jeopardize the continued existence of those species nor result in the destruction or adverse modification of their critical habitats. Analysis of the effects of this proposed project on threatened, endangered, and proposed species complies with the provisions of the ESA. The Bureau of Land Management (BLM) maintains an interest in protecting candidate species under their sensitive species policy (BLM Manual 6840), with the goal that actions on BLM-administered lands consider the welfare of these species and do not contribute to the need to list any of the sensitive species under the provisions of the ESA.

#### **1.1 Project Area Location**

The ARPA is located in the southwestern corner of Wyoming's Carbon County, within Townships 13 through 20 North (T13-20N) and Ranges 89 through 92 West (R89-92W) of the 6<sup>th</sup> principal meridian. The project area encompasses approximately 270,000 acres. Of this total, approximately 174,000 acres are managed by the U.S. Department of the Interior (USDI) BLM; 14,000 acres are managed by the State of Wyoming; and about 82,000 acres are private lands. A detailed description of the project area location can be found in section 1.1 of the Environmental Impact Statement (EIS) (USDI-BLM 2006).

#### **1.2 Project Description**

Anadarko E & P Company, LP (AEPC), along with other operators, proposes to drill approximately 2,000 development wells within the ARPA. While the Atlantic Rim EIS is being prepared, BLM has allowed the interim drilling of about 116 natural gas wells on six plan of development (POD) locations within the ARPA. The objective of the interim drilling program is to enable the ARPA operators to drill, complete, and produce the wells to determine which geologic objectives are gas-productive, which drilling and completion techniques are economical, if dewatering of the drilling objectives can be achieved, and what depths or pressure windows may be preferred to target economic gas production. In addition to those wells drilled under the Atlantic Rim interim drilling program, 210 previously approved wells, with accompanying production-related facilities, also exist within the ARPA.

Four alternatives have been developed for the proposed project: the Proposed Action, Alternative A (no action), Alternative C (spatial), and Alternative D (intensive reclamation). Each alternative and the Proposed Action are described below.

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### 1.2.1 Proposed Action

The operators have submitted a detailed plan of development for the ARPA, which is included in the EIS as appendix K (USDI-BLM 2006). In summary, they propose the following:

- The Proposed Action consists of drilling and developing approximately 2,000 new natural gas wells. Approximately 1,800 would be drilled to coal formations in the Mesaverde Group to develop coal bed natural gas resources. An additional 200 wells would be drilled to access conventional natural gas resources generally expected to be located deeper than the Mesaverde Group.
- The 2,000 proposed, new natural gas wells would be in addition to the approximately 116 ARPA exploration wells (as of the fall of 2005) from the interim drilling period.
- Proposed well spacing is eight wells per section (80-acre spacing) throughout the project area and may be reduced to four wells per section (160-acre spacing) depending on the geology and ability of the operators to release and recover the gas.
- Development and drilling would begin in 2006 within the ARPA and continue for approximately 20 years, with a life-of-project of 30–50 years. Various drilling- and production-related facilities (e.g., roads, pipelines, water wells, disposal wells, compressor stations, and gas processing facilities) would also be constructed throughout the ARPA.
- Under the Proposed Action, there would be approximately 4,500 acres of new short-term (initial, which equals <3 years) surface disturbance from well pads; 1,000 miles (approximately 9,850 acres) of new roads, upgrades of existing roads, and pipeline construction; and 1,480 acres of ancillary facilities. The total new short-term (initial) disturbance resulting from the proposed action would be about 15,800 acres or 7.9 acres per well on average.
- Long-term (i.e., life-of-project) disturbance following interim reclamation includes approximately 2,320 acres for wells pads, 3,636 acres for roads and utilities, and 285 acres for ancillary facilities for a total of 6,241 acres (3.1 acres per well on average). Interim reclamation would reduce the total acres of disturbance by about 9,500 acres.
- Produced water from individual wells would be gathered and routed to centralized water handling and storage sites, which would serve as central injection facilities. Produced water would be disposed of through re-injection, with two exceptions. One exception would be using the closed system as well as limited use for livestock and wildlife watering systems, with appropriate state permits. The second exception would be offsets for current artesian water sources. The operators anticipate that water produced from the 2,000 wells, if being dewatered simultaneously, would need approximately 166 injection wells for disposal.

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### 1.2.2 Alternative A (No Action)

National Energy Policy Act (NEPA) regulations require that EIS alternative analyses “include the alternative of no action” (40 CFR 1502.14(d)). For this analysis, *no action* means that the BLM would reject the operators’ proposal and “the proposed activity would not take place.”

With rejection of the operators’ proposal, subsequent development proposals could be received for access to state and private lands for mineral development. BLM does not approve or control development proposals upon state and private lands. Proposals for access across federal lands for oil and gas development and production-related activities could be received, processed, and as appropriate approved by the BLM at any time. This policy arises from the BLM Manual, Part 2800.06, which states in part that “It is the policy of the BLM to (D) allow owners of non-federal lands surrounded by public lands managed under Federal Land Policy and Management Act (FLPMA) a degree of access across public lands which will provide for the reasonable use and enjoyment of the non-federal land.”

Any such proposals, if they should occur, would be outside the scope of this analysis.

### 1.2.3 Alternative C

Development for natural gas would occur as in the Proposed Action, but would require the application of development protection measures in those areas with sensitive or crucial resource values (USDI-BLM 2006, appendix L). Alternative C would limit development across up to 95 percent of the project area. In general, constraints would focus on surface disturbance limits; limited operating periods; modification of drilling and construction practices; and, in some cases, no surface occupancy. Since site-specific locations for development are not known, site-specific impacts cannot be assessed at this time. Resource data, in the form of geographic information system (GIS) layers, would be used to identify specific areas of resource concern at the site-specific level. Examples of such resource concerns are sensitive wildlife and fish habitat and areas with sensitive soils. These types of areas are unique enough to require additional protective measures beyond what is already provided by applying required best management practices (USDI-BLM 2006, appendices H and J), lease stipulations, and Conditions of Approval. As an end product, GIS layers would be available to operators for development of site-specific proposals for their annual work program during the Application for Permit to Drill process.

Below is a summary of development protection measures that would be implemented in some locations based on the presence of resources. A detailed description of protection measures is provided in appendix L of the EIS (USDI-BLM 2006), including references to maps (USDI-BLM 2006, appendix M) depicting areas where the measures may be applicable.

- **Water and Soil Management.** No pad, compressor, or water transfer sites would be located in areas with predominately steep slopes or close to perennial waters or wetlands. Interim reclamation would be completed within 1 year of the spud date in areas with soils with excess salts and poor top soils, since these areas are more difficult to reclaim. Low-impact road design would be implemented in areas where soils have excess salts, high runoff potential, and severe road rating to reduce impacts from roads. This action should reduce salt and sediment loading in the Colorado River Basin, a resource management concern since the 1930s. Specifications for road construction and annual maintenance to reduce dust would be implemented in areas with soils with excess salts, and in areas with a severe

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road rating, since these areas would generally have a higher clay or salt content in the soils and hence be more prone to dust problems. Special measures would be implemented in areas with high runoff potential to reduce surface water concentration, increase infiltration, and achieve reclamation success. Areas with high runoff potential would also have reduced surface disturbance (less than 20 acres and four well locations per section).

- **Vegetation Resources.** In vegetation communities difficult to reclaim within the project area with greater than 8-percent slopes, surface disturbance would be limited to less than 20 acres and four well locations per section. In vegetation communities with high wildlife values or rare vegetation communities, no surface disturbance would be allowed (approximately 0.6 percent or 1,500 acres of the ARPA). Silver sagebrush/bitterbrush communities would have limited surface disturbance. All these communities within crucial winter range failed the Upper Colorado River Basin Standards and Guidelines Assessment (USDI-BLM 2002). These areas would continue to fail standards without additional development protection measures.
- **Range Resources.** To protect range resources, operators shall ensure that their employees and subcontractors abide by speed limits and erect signs warning drivers of livestock concentration areas such as lambing grounds and shipping pastures. Annual planning efforts would provide data to allow planning specific to pastures or allotment boundaries to facilitate livestock planning. Construction specifications will be put in place to reduce dust.
- **Wildlife Resource Management.** In grouse brood rearing or nesting habitat and big game crucial winter range, surface disturbance (less than 20 acres and four wells locations per section) and roads would be limited to less than 3 miles/mile<sup>2</sup>, based on programmatic standards recommended by the Wyoming Game and Fish Department (WGFD). No surface disturbance would be allowed in severe winter relief habitats for greater sage-grouse; these areas serve as refuges, that is, small patches of high sagebrush that generally will not drift during severe winters. No surface disturbance would be allowed in identified wintering areas (serviceberry patches) for Columbian sharp-tailed grouse.
- **Visual Resources.** In Visual Resource Management (VRM) Class III areas visible from state, county or BLM roads (USDI-BLM 2006, appendix M, map M-6):
  - Drilling pads would not be located on ridgelines;
  - Resource roads would not be located directly off these public roads, unless it is shown to be visibly less obtrusive than creating a new collector road;
  - Low-impact road design would be used in topography with less than 5-percent slope (See appendix L of the EIS for a description of low-impact road design [USDI-BLM 2006]);
  - Pad sizes would be minimized by using pitless, shared pit, or closed system drilling; and
  - Where topography would allow, interim reclamation of pits and pads would occur within 1 year of the spud date.

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- **Sand Hills Special Management Area (SMA).** This area is a popular hunting spot and is generally isolated from oil and gas development activities. There is currently an extensive network of two track routes in this area. The gently rolling terrain has stabilized sand dunes and unique vegetation communities that contribute to high wildlife values. This area would need reduced road densities and to restrict some public access conditions, especially on newly constructed roads. To develop additional roads, operators could reclaim mile-for-mile current roads in the area, plus reclaim existing roads to reduce road density to 3 miles/mile<sup>2</sup>. Fences could be converted to BLM standards for improved wildlife passage. Surface disturbance would be limited in silver sagebrush/bitterbrush communities in addition to those identified for vegetation resources. No surface disturbance would be allowed within the 18 acres surrounding the historical JO Ranch buildings.
- **Cow Butte/Wild Cow SMA.** This area is a popular hunting spot and is generally isolated from oil and gas development activities. There is currently an extensive network of two track routes in this area. Terrain is generally steep with highly erosive soils. The area has high wildlife values due to the vegetation communities. To develop additional roads, operators could reclaim mile-for-mile current roads in the area plus existing roads to reduce road density to 3 miles/mile<sup>2</sup>. Development protection measures would reduce pad density. Fences could be converted to BLM standards for improved wildlife passage.
- **Historic Trails SMA.** Historical trails are a unique cultural resource documenting the difficult journeys made in the early West. Within the ARPA, three trails are eligible for the National Register of Historic Places. These areas would receive the following development protection measures: low-impact road design would be used and interim reclamation would be completed within 1 year of the spud date, no surface disturbance would be allowed within a quarter mile of contributing segments, and road or pipeline collocation would be required and trail crossings permitted only in areas of previous disturbance. Extensive efforts would be made to minimize the visual impact and surface disturbance.
- **Upper Muddy Creek Watershed/Grizzly SMA.** Muddy Creek contains critical habitat for BLM sensitive fish species. This area is generally isolated from oil and gas development activities. There is currently an extensive network of two track routes in this area. In general it has poor soils and high wildlife values. Current road densities and public access conditions would be maintained. To develop additional roads, operators could reclaim mile-for-mile current roads in the area plus existing roads to reduce road density to 3 miles/mile<sup>2</sup>. Fences could be converted to BLM standards for improved wildlife passage. Detailed planning specific to this area would be required, and roads in general would require more mitigation and design than in other areas. Where slopes are generally steeper than 8 percent, no surface disturbance would be allowed (44 percent of this SMA is within the project area). No new road crossings of Muddy Creek would be allowed.

### 1.2.4 Alternative D

The goal of this alternative is to minimize surface disturbance while optimizing natural gas recovery. Annual planning between the operators and the BLM, as proposed in the Proposed Action, will be a key component of this alternative. Annual planning will require the operators to submit to the BLM their proposed plan of operation for the forthcoming year. The BLM will then

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work with the operators at a site-specific level (Application for Permit to Drill [APD]) to minimize surface disturbance by applying the appropriate lease stipulations, conditions of approval, best management practices, and any other measures deemed necessary to minimize surface disturbance and still allow for the recovery of natural gas.

Coal bed and conventional natural gas resources would be developed while intensive reclamation activities would stabilize disturbed soils and vegetation communities. For the overall Atlantic Rim area, no more than 7,600 acres of the project area would be disturbed and unsuccessfully reclaimed at any time. For the overall Atlantic Rim area, there would be a 6.5 acres/well pad short-term disturbance goal (2.8 percent of the ARPA). Those areas designated as *Category A* would have a short-term disturbance goal of less than 6.5 acres/well pad. *Category A*, as depicted on map M-7 (USDI-BLM 2006, appendix M), incorporates areas with sensitive fish populations and crucial wildlife habitats, including as unique vegetation communities, and is about 72,200 acres in extent.

The pace of development analyzed is the same as disclosed on figure 4-6 of the EIS. As disturbance levels increase from natural gas development activities, reclamation efforts would intensify. If the disturbance limit should be reached, further disturbance activities would be halted pending successful reclamation. Upon reclamation success further natural gas development proposals would be considered and approved as appropriate under the disturbance limit. Reclamation success is achieved when the criteria listed in section 2 (“Criteria for Reclamation Success”) of the EIS Reclamation Plan (USDI-BLM 2006, appendix B) are met.

Disturbance levels would be determined through geo-spatial shapefiles provided annually by the operators in accordance with the EIS Reclamation Plan (USDI-BLM 2006, appendix B). Reclamation would be reviewed, at a minimum, annually. For those areas needing further work, adaptive management using appropriate best management practices would be implemented to ensure subsequent reclamation success. Operators would propose and implement reclamation measures that would be used the following growing season for both areas with reclamation problems and newly disturbed areas.

## 2 Methods

The assessments and recommendations contained within this BA are based upon information obtained from several sources: 1) published literature, 2) unpublished agency reports and data, 3) personal communications with state and federal agency wildlife specialists, 4) meetings with state and federal agency plant and wildlife specialists, and 5) field surveys.

### 2.1 Published Literature

Published scientific documents that pertain directly to the specific circumstances and issues involved in this analysis were reviewed and incorporated into this BA. All published literature used in this assessment is appropriately cited.

### 2.2 Unpublished Agency Reports and Data

Unpublished documents and data sets from the files of the WGFD and the U.S. Fish and Wildlife Service (USFWS) were reviewed, utilized, and referenced in this BA. All available information on threatened and endangered species in the project area was reviewed in the preparation of the EIS and this BA. Materials reviewed include distribution and habitat maps,

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progress reports, recovery plans, sighting records, management plans, and survey guidelines for threatened and endangered species.

Some information concerning historical wildlife usage of the project area was obtained through Rawlins BLM Field Office and District IV biologists of the WGFD. This information was specific to current and historical locations for wildlife species. Additional information was obtained from the WGFD, which maintains a computerized listing of all wildlife species reported in an area. This listing, known as the Wildlife Observation System (WOS) was accessed for information concerning all species of wildlife (birds, mammals, amphibians, and reptiles) that have been observed and recorded within the ARPA and a township buffer (T12-21N, R88-93W) as residents or seasonal migrants. The Wyoming Natural Diversity Database (WYNDD) was also queried for reports of rare or unique plant and wildlife species within the ARPA.

### 2.3 Personal Communications

Individuals interviewed during the fact-finding process, either directly or by telephone, included the following:

- Mr. Frank Blomquist (BLM Wildlife Biologist, Rawlins, WY),
- Ms. Pat Deibert (USFWS Biologist, Cheyenne, WY),
- Ms. Kathleen Erwin (USFWS Biologist, Cheyenne, WY),
- Mr. Walt Fertig (WYNDD Heritage Biologist, Laramie, WY),
- Ms. Mary Read (BLM Wildlife Biologist, Rawlins, WY),
- Mr. Andy Warren (BLM Supervisory Rangeland Management Specialist, Rawlins, WY),
- Mr. Greg Hiatt (WGFD Wildlife Biologist, Sinclair, WY), and
- Mr. Tim Woolley (WGFD Wildlife Biologist, Baggs, WY).

### 2.4 Meetings

Numerous meetings were held among state and federal wildlife specialists and Hayden-Wing Associates (HWA) concerning potential impacts to wildlife that may result from the proposed project. All of the concerns raised in these meetings regarding development of the proposed project have been addressed in either this BA or the EIS (USDI-BLM 2006).

### 2.5 Field Surveys

Existing special-status wildlife information for the project area was supplemented through wildlife surveys conducted by HWA from 2000 to 2004. These data collections consisted of aerial and ground surveys to determine 1) the occurrence of threatened, endangered, proposed, candidate, or sensitive species and habitat that may occur on the project area; 2) the occurrence, location, and size of white-tailed prairie dog colonies; and 3) the location and activity status of raptor nests within the project area and within a 1-mile buffer zone.

### 2.6 Biological Assessment Preparation

Personnel who cooperated in the preparation of this BA include the following:

- L.D. Hayden-Wing—principal investigator of HWA and a member of the Inter-Disciplinary Team—supervised the collection of wildlife data and compilation of the overall BA.

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- T. Olson—wildlife biologist with HWA—and B. Parkhurst prepared the BA.
- J. Winstead, K. Jones, T. Olson, L. Bennett, and D. Knowlton—wildlife biologists with HWA—assisted in the collection of field data.
- Frank Blomquist (BLM, Rawlins Field Office) and Amber Travsky (Real West Consultants) reviewed and finalized the document.

### 3 Current Status and Habitat Use of Species

The USFWS has determined that nine species—which are listed under the ESA as either threatened, endangered, or proposed species or are candidates for listing under the ESA—are potentially present within the area administered by the Rawlins BLM Field Office (USDI-FWS 2004a, table 1). In addition, ten species—which are found downstream of the area administered by the Rawlins BLM Field Office in the Platte and Colorado River systems—may potentially be impacted if water depletions occur. These species are listed in table G-1, along with their federal status under the ESA.

The following subsections describe the current status and habitat use of these species.

**Table G-1. Threatened, Endangered, Proposed, or Candidate Species That Might Be Present within the Area Administered by the Rawlins BLM Field Office or That Might Be Impacted by the Proposed Action.**

Common Name	Scientific Name	Status
<b>Mammals</b>		
Black-footed Ferret	<i>Mustela nigripes</i>	Endangered
Canada lynx	<i>Lynx Canadensis</i>	Threatened
Preble’s meadow jumping mouse	<i>Zapus hudsonius preblei</i>	Threatened
<b>Birds</b>		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate
Whooping crane <sup>1</sup>	<i>Grus Americana</i>	Endangered
Interior least tern <sup>1</sup>	<i>Sterna antillarum</i>	Endangered
Piping plover <sup>1</sup>	<i>Charadrius melodus</i>	Threatened
Eskimo curlew <sup>1</sup>	<i>Numenius borealis</i>	Endangered
<b>Amphibians</b>		
Wyoming toad	<i>Bufo baxteri</i>	Endangered
<b>Fish</b>		
Colorado pikeminnow <sup>2</sup>	<i>Ptychocheilus lucius</i>	Endangered
Bonytail <sup>2</sup>	<i>Gila elegans</i>	Endangered
Humpback chub <sup>2</sup>	<i>Gila cypha</i>	Endangered
Razorback sucker <sup>2</sup>	<i>Xyrauchen texanus</i>	Endangered

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**Table G-1. Threatened, Endangered, Proposed, or Candidate Species That Might Be Present within the Area Administered by the Rawlins BLM Field Office or That Might Be Impacted by the Proposed Action.**

<b>Fish</b>		
Pallid Sturgeon <sup>1</sup>	<i>Scaphirhynchus albus</i>	Endangered
<b>Plants</b>		
Blowout penstemon	<i>Penstemon haydenii</i>	Endangered
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened
Colorado butterfly plan	<i>Gaura neomexicana</i> ssp. <i>Coloradensis</i>	Threatened
Western prairie fringed orchid	<i>Platanthera praeclara</i>	Threatened

### 3.1 Threatened, Endangered, Proposed, and Candidate Species

#### 3.1.1 Black-Footed Ferret

The black-footed ferret's original distribution in North America closely corresponded to that of prairie dogs (Hall and Kelson 1959, Fagerstone 1987). In Wyoming, prairie dog (*Cynomys* spp.) colonies provide essential habitat for black-footed ferrets. Ferrets depend almost exclusively on prairie dogs for food and they also use prairie dog burrows for shelter, parturition, and raising young (Hillman and Clark 1980, Fagerstone 1987). Prairie dog towns occurring within the project area were initially located from the air and subsequently mapped from the ground in their entirety. Prairie dog colonies were mapped from an ATV or on foot using a hand-held Global Positioning System (GPS) receiver. Additional studies identified a total of 295 white-tailed prairie dog colonies that comprised 6,300 acres within the ARPA (equal to 2.3 percent of the area).

On February 2, 2004, the USFWS issued a letter stating that, in Wyoming, surveys for black-footed ferrets are no longer warranted in black-tailed prairie dog complexes and in many white-tailed prairie dog complexes, except for 16 non-block-cleared, white-tailed prairie dog complexes (USDI-FWS 2004b). One of these complexes, the Dad Complex is located partially within the ARPA. For the ARPA, a total of 273 white-tailed prairie dog colonies (covering 5,720 acres) are located within the Dad Complex and are not included under the block clearance. Therefore, surveys for black-footed ferrets may be warranted before ground-disturbing activities within these prairie dog colonies. Surveys would be conducted according to USFWS guidelines (USDI-FWS 1989). The remaining white-tailed prairie dog colonies within the ARPA have been block-cleared and surveys for black-footed ferrets are no longer warranted. However, these towns located within the block-clearance area should be examined for their potential to provide habitat for relocation of black-footed ferrets.

#### 3.1.2 Canada Lynx

The Canada lynx is one of three major species of wildcats found in North America. Although Wyoming is a part of the species' historic geographical range, no lynx sightings have been documented in the ARPA or within a 6-mile buffer (WGFD 2003). The closest known sighting of a lynx to the ARPA is approximately 55 miles to the east (Reeve et al. 1986 and

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Beauvais et al. 2001). In a collaborative effort, the BLM and the WYNDD completed a lynx habitat suitability map for the State of Wyoming (Beauvais et al. 2001). According to the habitat map, lands within the ARPA provide low to poor quality lynx habitat. Lynx could potentially travel through the ARPA, but the likelihood of this is very low due to a lack of suitable habitat.

It is unlikely that lynx occur within or near the ARPA due to the facts that:

1. The project area does not include high elevation lodgepole pine/spruce-fir habitat types preferred by this species,
2. The project area does not support a population of snowshoe hares (WGFD 2003),
3. There are no recorded lynx sightings within a 6-mile buffer in either the WOS (WGFD 2003) or the WYNDD (2003), and
4. The closest potential habitat is approximately 6 miles to the east in the Sierra Madre Mountains.

Because lynx are unlikely to occur within or near the project area, they are not discussed further in this BA.

### 3.1.3 Preble's Meadow Jumping Mouse

In Wyoming, Preble's meadow jumping mouse is found within riparian habitat corridors east of the Laramie Range Mountains and south of the North Platte River (USDI-FWS 2004a). Preble's meadow jumping mouse is closely related to the western jumping mouse, and subspecies are generally identified by geographic location (Beauvais 2000). The ARPA is located more than 100 miles west of the known distribution of the Preble's meadow jumping mouse and this species is not expected to occur on the project area and is therefore not discussed further in this document.

### 3.1.4 Bald Eagle

Bald eagles typically build stick nests in the tops of coniferous or deciduous trees along streams, rivers, or lakes. Selection of nest sites likely depends upon availability of food in the early nesting season (Swenson et al. 1986). Although no bald eagle nests or nesting habitat occurs within the project area, nesting habitat does occur south of the project area along the Little Snake River. Primary wintering areas are typically associated with concentrations of food sources including major rivers that remain unfrozen where fish and waterfowl are available and ungulate winter ranges where carrion is available (Montana Bald Eagle Working Group 1990).

Bald eagles have been observed within the project area primarily during December, January, and February (WGFD 2003). The majority of bald eagle locations within the project area are in the southern portion of the ARPA close to the Little Snake River. Bald eagles may utilize the project area for foraging during winter months because a large portion of the area consists of winter range for antelope, mule deer, and elk.

The bald eagle winters and nests in proximity to the project area along the Little Snake River. Several ecological factors probably enable seasonal and year-round use by bald eagles along the Little Snake River:

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1. Some water may remain open on the river year-round providing an adequate supply of fish and waterfowl,
2. The river is adjacent to crucial ungulate winter range, and
3. The riparian zone has many large cottonwood trees for roosting and nesting.

This habitat along the Little Snake River is located 0.5 to 2 miles south of the ARPA. Upland habitat use by bald eagles within the project area would probably be limited to winter scavenging forays. Few trees large enough for eagle roosting or nesting exist within the project area. HWA reviewed BLM raptor nest records, WGFD WOS records, and results of aerial and ground raptor nest surveys and found no records of occurrence of bald eagle nests within the ARPA.

### 3.1.5 Yellow-Billed Cuckoo

The yellow-billed cuckoo is a neotropical migrant that winters in South America and breeds from southeastern Canada, throughout most of the United States (except the northern Great Plains to the northwest coast), and northern Mexico (Payne 1997). In North America, the cuckoo population is divided into two subspecies. The population west of the Continental Divide is considered the Western or California subspecies and the population east of the Continental Divide is the Eastern subspecies. Trends developed from Breeding Bird Survey (BBS) data indicate that the yellow-billed cuckoo is declining throughout its range, but that the most dramatic declines have been associated with the Western subspecies.

As a result, the yellow-billed cuckoo has twice been petitioned as an endangered species pursuant to the ESA. The Southwest Region of the USFWS rejected the first petition submitted in 1987. The second petition was submitted in 1998 and called for the listing of cuckoos west of the Continental Divide as a subspecies or a geographically, morphologically, behaviorally, and ecologically distinct population from cuckoos east of the Continental Divide. In July 2001, the USFWS concluded that the petitioned action was warranted, but precluded listing actions by higher priority. Currently, the Western subspecies of yellow-billed cuckoo (located west of the Continental Divide) is considered a candidate species.

Observations of the yellow-billed cuckoo in Wyoming are very rare, with approximately 24 documented observations since 1982 (Bennett 2002). The yellow-billed cuckoo is a BLM-sensitive species throughout all of Wyoming and it may be found in cottonwood/riparian habitats below 7,000 feet and in urban areas throughout the state (WGFD 1999). In Wyoming, it is thought to prefer cottonwood stands for foraging and willow thickets for nesting.

The ARPA does not include any large riparian areas with well-developed cottonwood/riparian habitats; therefore, it is unlikely that the yellow-billed cuckoo occurs within the project area. Also, the yellow-billed cuckoo has not been documented on the ARPA (WGFD 2003, WYNDD 2003). It is therefore not discussed further in this BA.

### 3.1.6 Wyoming Toad

The Wyoming toad was historically associated with floodplain ponds along the Big and Little Laramie Rivers in Albany County (Baxter and Stone 1992). Currently, the Wyoming toad is only known to occur at Mortenson Lake National Wildlife Refuge. However, reintroduction efforts are underway in other portions of its former range. The Wyoming toad did not historically, and

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does not currently, occur on or near the ARPA and is therefore not discussed further in this document.

### 3.1.7 Blowout Penstemon

Blowout penstemon is a member of the Scrophulariaceae (Figwort) family (Fertig 2001) and is probably the rarest plant species native to the Great Plains (NGPC 2002). The species is most common in the open, sandy habitats of wind-excavated depressions (blowouts) in dune tops. In Wyoming, the species has also been documented on very steep, unstable sand dunes (Fertig 2001). Within these limited habitats, this short-lived perennial frequently occurs in large, multi-stemmed clumps. When in bloom in Wyoming in June and July, its lavender-purple flowers stand out against other sparse vegetation found in and around sandy blowouts. In addition to features of its leaves and flowers, blowout penstemon's lavender or vanilla-like fragrance distinguishes it as only one of two fragrant species of the 300 penstemons in the world (NGPC 2002).

The reproductive life history of the species has led, in part, to the decline of blowout penstemon populations in Wyoming and other native regions. The primary limiting factor in seedling establishment is moisture availability. For blowout penstemon seeds to germinate, and for the roots to reach a depth where moisture is available and constant, blowout sand must remain damp for at least 2 weeks during the growing season (NGPC 2002). In the arid environment of sandy blowouts, these conditions usually only occur in one out of every 8 to 10 years (NGPC 2002). Exacerbating the effects of limited germination and establishment conditions is the loss of blowout habitats. Active fire suppression programs and improved range management practices have led to increases in prairie vegetation cover with decreases in sandy areas. The species now remains in only a few locations where wind erosion has maintained sandy blowouts (NGPC 2002).

Blowout penstemon is known to occur in certain habitats south of the Ferris Mountains in the northern part of Carbon County. The plant has the potential to occur on the project area (Fertig 2001, USDI-FWS 2002), especially in the Sand Hills area where a few active sand dunes are known to exist (Warren 2002). However, the species was not found during field surveys of this area by WYNDD personnel in June 2000 (Fertig 2001).

### 3.1.8 Ute Ladies'-Tresses

Ute ladies'-tresses is a perennial, terrestrial orchid with stems 8 to 20 inches tall and flowers consisting of white or ivory flowers clustered into a spike arrangement at the top of the stem. The plant blooms mainly from late July through August; however, depending on location and climatic conditions, it may bloom in early July or still be in flower as late as early October. Habitat for Ute ladies'-tresses can occur in major riparian corridors subject to fluvial erosion/deposition or, more ideally, in moist to very wet meadows along streams. It has also been found in abandoned stream meanders that still have ample groundwater, near springs, and lakeshores. The habitat on which the species depends has been drastically modified by urbanization, agriculture, and development (This description was adapted from NatureServe [2003]).

Ute ladies'-tresses was designated as threatened in 1992 when it was only known from Colorado, Utah, and Nevada. Since that time, it has been found in Wyoming, Montana, Nebraska, and Idaho (NatureServe 2003). The known locations of the species in Wyoming include Converse, Goshen, Laramie, and Niobrara Counties. Much of the ARPA is located

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above the upper known elevation of occurrence (6,800 feet) for this species (Fertig 2000a) and the species is not known to occur within the ARPA. However, some areas along the eastern portion of the ARPA may contain marginal habitats for the Ute ladies'-tresses.

### 3.1.9 Colorado Butterfly Plant

The Colorado butterfly plant is a short-lived perennial herb that typically occurs on sub-irrigated soils on level or slightly sloping floodplains and drainage bottoms at elevations of 5,000–6,400 feet (Fertig 2000b). The species is often found a short distance from meandering stream channels. This species is known to occur in Laramie County in southeastern Wyoming, in southwestern Nebraska, and in northeastern Colorado. This species is not known and is not expected to occur within or near the ARPA and is therefore not discussed further in this document.

### 3.2 Colorado River Species

Within the ARPA, a total of approximately 284 miles of intermittent, ephemeral, and perennial streams occur. Perennial surface water is relatively scarce within the ARPA due to limited precipitation (5.8–24.3 inches/year). The majority of drainages within the ARPA are ephemeral drainages. Ephemeral waters are those in which the water table is always below the stream channel and only flow in direct response to precipitation or snow melt. Ephemeral waters only support very limited aquatic communities for the short periods when surface flow is present. However, Muddy Creek, its tributaries McKinney Creek and Littlefield Creek, and Savery Creek are perennial streams. The Wyoming Department of Environmental Quality classifies these streams as Class 2 and 3, which support game and non-game species. These streams are considered to be locally to regionally important trout fisheries by the WGFD (1991 and 1998).

About 15 reservoirs and ponds (0.5–20 acres) are present within the Colorado River watershed portion of the ARPA. Some of the ponds and reservoirs that currently exist within the ARPA are fed by waters recovered from wells drilled at upstream locations, while others are impoundments on small drainages. These man-made impoundments are generally designed to supply water for livestock and wildlife use.

Four federally endangered fish species may occur as downstream residents of the Colorado River system: Colorado pikeminnow (*Ptychocheilus lucius*), bonytail (*Gila elegans*), humpback chub (*Gila cypha*), and razorback sucker (*Xyrauchen texanus*) (USDI-FWS 2004a). The Colorado pikeminnow, bonytail, and humpback chub are all members of the minnow family. The razorback sucker is a member of the sucker family. All four of these fish species share similar habitat requirements and historically occupied the same river systems.

The last sighting of any of these fish species in the Little Snake River was of a single Colorado pikeminnow in 1990. Because habitat for these species is not present within the ARPA, these fish species are not likely to be found in tributaries to the Little Snake River within the ARPA, and critical habitat for these species has not been designated in Wyoming (Upper Colorado River Endangered Fish Recovery Program 1999). However, the potential for project-related reductions in water quantity or quality to these tributaries to the Colorado River warrant their inclusion in this document.

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### 3.2.1 Colorado Pikeminnow

The Colorado pikeminnow is the largest member of the minnow family and occurs in the swift, warm waters of Colorado Basin rivers. The species was once abundant in the main stem of the Colorado River and most of its major tributaries throughout Wyoming, Colorado, Utah, New Mexico, Arizona, Nevada, California, and Mexico. It was known to occur historically in the Green River of Wyoming at least as far north as the city of Green River. In 1990, one adult was collected from the Little Snake River in Carbon County, Wyoming (Baxter and Stone 1995). Subsequent survey attempts to collect Colorado pikeminnow from this area of the Little Snake River by WGFD personnel failed to yield any other specimens.

### 3.2.2 Bonytail

Habitat of the bonytail is primarily limited to narrow, deep, canyon-bound rivers with swift currents and white water areas (Valdez and Clemmer 1982, Archer et al. 1985, and Upper Colorado River Endangered Fish Recovery Program 1999). With no known reproducing populations in the wild today, the bonytail is thought to be the rarest of the endangered fishes in the Colorado River system.

The bonytail historically inhabited portions of the upper and lower Colorado River Basin. Today, in the upper Colorado River Basin, only small, disjunct populations of bonytail are thought to exist in the Yampa River in Dinosaur National Monument, in the Green River at Desolation and Gray Canyons, in the Colorado River at the Colorado/Utah border, and in Cataract Canyon (Upper Colorado River Endangered Fish Recovery Program 1999).

### 3.2.3 Humpback Chub

Habitat of the humpback chub is also limited to narrow, deep, canyon-bound rivers with swift currents and white water areas (Valdez and Clemmer 1982, Archer et al. 1985, and Upper Colorado River Endangered Fish Recovery Program 1999). The humpback chub was historically found throughout the Colorado River system and its tributaries, which are used for spawning (Valdez et al. 2000). It is estimated that the humpback chub currently occupies 68 percent of its original distribution in five independent populations that are thought to be stable (Valdez et al. 2000).

### 3.2.4 Razorback Sucker

The razorback sucker is an omnivorous bottom feeder and is one of the largest fishes in the sucker family. Adult razorback sucker habitat use varies depending on season and location. This species was once widespread throughout most of the Colorado River Basin from Wyoming to Mexico. Today, in the Colorado River Basin, populations of razorback suckers are only found in the upper Green River in Utah, the lower Yampa River in Colorado, and occasionally in the Colorado River near Grand Junction (Upper Colorado River Endangered Fish Recovery Program 1999).

## 3.3 Platte River Species

A small portion of the ARPA drains into the Platte River system and, according to the USFWS (USDI-FWS 2004a), water depletions in the Platte River system may contribute to the destruction or adverse modification of designated critical habitat for the following species. None

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of these species or their habitats are found within the ARPA, but they could be impacted by actions taken on the ARPA.

### 3.3.1 Whooping Crane

Critical habitat for the whooping crane downstream of the ARPA is located along the Platte River bottoms between Lexington and Dehman, Nebraska (Federal Register 1978). Whooping crane habitat consists of large expanses of wetlands that provide suitable food (insects, crayfish, frogs, small fish, etc.) and open expanses near wetlands for nightly roosting (Federal Register 1978).

### 3.3.2 Interior Least Tern

The interior least tern nests on unvegetated sand-pebble beaches and islands of large reservoirs and rivers. Interior least terns avoid areas where relatively thick vegetation provides cover for potential predators. No habitat for the interior least tern is found on the ARPA, but habitat is located downstream of the ARPA along the Platte River in Nebraska (USDI-FWS 1990).

### 3.3.3 Piping Plover

Critical habitat for the piping plover includes prairie alkali wetlands and surrounding shoreline to 200 feet of uplands above the high water mark; river channels and their associated sandbars and islands; reservoirs and their sparsely vegetated shorelines, peninsulas, and islands; and inland lakes and their sparsely vegetated shorelines and peninsulas (Federal Register 2002). Critical habitat for the species downstream of the ARPA in Nebraska begins at the Lexington Bridge and extends to the Platte's confluence with the Missouri River 252 miles (405.5 kilometers) downstream (Federal Register 2002). Approximately a quarter of this part of the Platte River is also designated as critical habitat for the whooping crane. Open shorelines and sandbars of rivers, large reservoirs, alkali wetlands, lakes, and rivers provide suitable breeding habitat for the piping plover.

### 3.3.4 Eskimo Curlew

The eskimo curlew migrates from wintering grounds in the pampas of Argentina, northward through Central America and the central Great Plains of North America to breeding grounds in northern Canada and Alaska (Gollop et al. 1986). The spring migration route passes through Nebraska, where the birds may stop over along the Platte River. In the fall they migrate eastward to Labrador, then south over the Atlantic Ocean back to South America (Gollop et al. 1986). Habitat for the eskimo curlew includes grasslands, tundra, burned prairies, plowed fields, marshes, mudflats, meadows, and pastures. Burned prairies and marshes may be attractive during migration (Gollop et al. 1986). The loss of prairie habitat in North America may have contributed to the decline of the eskimo curlew, but the primary reason for the rarity of the bird was market hunting in the late 1800s and early 1900s (Gollop et al. 1986). No suitable habitat for the eskimo curlew occurs on the ARPA and the species has not been reported within or near the ARPA (WGFD 2003, WYNDD 2003).

### 3.3.5 Pallid Sturgeon

The pallid sturgeon is a native fish found in the Mississippi/Missouri River system. The pallid sturgeon is present in the Platte River, a tributary to the Missouri River, located downstream

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from a portion of the ARPA. Suitable habitat for the pallid sturgeon consists of large turbid rivers with sand or gravel bottoms. The pallid sturgeon is threatened by habitat degradation such as decreased turbidity, which can be caused by impoundments.

### 3.3.6 Western Prairie Fringed Orchid

The western prairie fringed orchid is a long-lived perennial herb with stems that can grow to 1.2 meters tall from an underground tuber. The plant blooms for about a 3-week period starting in mid-June in the southern portion of its range to late July in the north. Habitat of the western prairie fringed orchid is the western portions of the North American tallgrass prairie. It is most commonly observed on moist, calcareous soils; sub-saline prairies; and sedge meadows (many flooded for a period of 1–2 weeks during the year). Published accounts and herbarium records suggest that this plant was widespread and perhaps locally common before European settlement. Declines are due to the extensive and ongoing conversion of the tallgrass prairie to agricultural uses throughout its range (This description was adapted from NatureServe [2004]).

The western prairie fringed orchid was designated as a threatened species in its entire range in 1989. Within the area covered by this listing, this species is known to occur in Iowa, Kansas; Minnesota; Missouri; North Dakota; Nebraska; Oklahoma; and in Manitoba Province, Canada (NatureServe 2003).

## 4 Direct and Indirect Impacts of the Proposed Project

The EIS (USDI-BLM 2006) for the ARPA selected Alternative D as the preferred alternative, as defined in section 1.2.4. Under Alternative D, up to 13,000 acres of wildlife habitat would be disturbed by construction activities over the next 20 years. With interim reclamation of disturbed habitats, the total unreclaimed disturbance area is capped at 7,600 acres (2.8 percent of the ARPA) at any point in time. Reclamation would reduce impacts to 5,000 acres or 1.9 percent of the ARPA by the end of the development phase of the project. Reclamation success will be influenced by timing of reclamation and climatic conditions.

Although the total acres of wildlife habitat that would be disturbed under Alternative D over the next 20 years is known, the distribution of this disturbance will not be known until actual site-specific well locations and other disturbance activities are determined. To assess the direct and indirect impacts of the proposed project, it was assumed that any section of land might be developed at the level of eight well locations per section.

The following subsections evaluate the direct and indirect impacts of Alternative D on the species carried forward from the evaluation in section 3.

### 4.1 Threatened, Endangered, Proposed, and Candidate Species

The threatened, endangered, proposed, and candidate species carried forward from section 3 are discussed below and include the black-foot ferret, the bald eagle, blowout penstemon, and the Ute ladies'-tresses.

#### 4.1.1 Black-Footed Ferret

Two hundred and ninety-five white-tailed prairie dog colonies inhabit 6,300 acres within (or 2.3 percent of) the ARPA. A total of 273 white-tailed prairie dog colonies within the ARPA,

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covering 5,720 acres, are located within the Dad Complex and are not included under the block clearance. These colonies meet requirements for consideration as black-footed ferret habitat (Biggins et al. 1989). Development of the Proposed Action would likely result in direct disturbance of some portions of these prairie dog colonies.

Surveys for black-footed ferrets may be required before ground-disturbing activities within prairie dog colonies located in the Dad Complex. Surveys would be conducted according to USFWS guidelines (USDI-FWS 1989). The remaining white-tailed prairie dog colonies within the ARPA are in the block clearance area, where surveys for black-footed ferrets are no longer required. However, these towns located within the block-clearance area should be examined for their potential to provide habitat for relocation of black-footed ferrets.

Projects would not be authorized within white-tailed prairie dog colonies within the Dad Complex unless surveys for black-footed ferrets have been completed. If surveys are required, consultation with the USFWS will be initiated before the surveys are conducted. If black-footed ferrets are found, no project-related disturbance will occur within the prairie dog complex and all project-related activities in such towns or complexes shall be suspended immediately. The USFWS will be notified within 24 hours if a black-footed ferret or sign thereof is observed. Although black-footed ferrets may be affected by this project, as long as the prescribed avoidance and protective measures (listed in section 6) are implemented, they are unlikely to be adversely affected.

### 4.1.2 Bald Eagle

Bald eagles have been observed within the project area primarily during December, January, and February (WGFD 2003). The majority of bald eagle locations within the project area are in the southern portion of the ARPA close to the Little Snake River. Bald eagles may utilize the project area for foraging during winter months because a large portion consists of winter range for antelope, mule deer, and elk.

Upland habitat use by bald eagles within the project area would probably be limited to winter scavenging forays. Few trees large enough for eagle roosting or nesting exist within the project area. HWA reviewed BLM raptor nest records, WGFD WOS records, and results of aerial and ground raptor nest surveys and found no records of occurrence of bald eagle nests within the ARPA. The southern portion of the project area, closest to the Little Snake River, has the highest potential for bald eagle occurrence. This portion of the ARPA contains crucial winter range for elk, mule deer, and pronghorn.

The potential for vehicle collisions with big game would increase as a result of increased vehicular traffic associated with the presence of construction crews and activities in the project area. Because bald eagles commonly feed on carrion, particularly during the winter months, they would be attracted to road-killed big game carcasses on and adjacent to the access roads. Eagles feeding on these carcasses are in danger of being struck by moving vehicles. Any increase in the death rate of bald eagles from vehicular collisions will constitute a significant impact. Because the potential for an increase in the incidence of vehicle-eagle encounters exists, measures to avoid or reduce such incidents shall be taken. Such measures shall include the following:

1. Regular drivers shall undergo training that describes the circumstances under which vehicular collisions with bald eagles are likely to occur and the measures that can be taken to minimize them, including reduced speeds.

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2. Operations personnel shall be prohibited from unnecessary off-site activities and all project employees shall be informed of applicable wildlife laws and penalties associated with unlawful take and harassment of bald eagles.
3. Vehicle-killed carcasses shall be removed from the right-of-ways of access roads within the project area to eliminate the exposure of carrion-feeding eagles to the threat of being struck by vehicles.
4. Operators shall internally enforce existing drug, alcohol, and firearm policies.

Given the implementation of these measures, the bald eagle might be affected, but is not likely to be adversely affected.

### 4.1.3 Blowout Penstemon

Blowout penstemon is known to occur in certain habitats south of the Ferris Mountains in the northern part of Carbon County. The plant has the potential to occur within the project area (Fertig 2001 and USDI-FWS 2002) only in the Sand Hills area where a few active sand dunes are known to exist (Warren 2002). However, the species was not found during field surveys of this area by WYNDD personnel in June 2000 (Fertig 2001). Given the presence of potential habitat within the ARPA, implementation of the proposed project's alternatives might directly impact some individual plants of this species. If this species is found within the ARPA, the specific sites where it is found shall be avoided to prevent any potential impacts.

### 4.1.4 Ute Ladies'-Tresses

The known locations of Ute ladies'-tresses in Wyoming include Converse, Goshen, Laramie, and Niobrara Counties. Potentially suitable habitats for this species are very limited within the ARPA. This species is not known to occur within the ARPA and the likelihood of it occurring in the ARPA is low due to the following reasons: 1) much of the ARPA is very arid and there are few perennial streams, 2) the elevation of the project area is near the upper limit for the species, 3) very few moist riparian area meadows are present, 4) the transition from stream margins to upland vegetation is abrupt, and 5) the species has only been located in eastern and southeastern Wyoming (Fertig 2000a). Given the presence of potential habitat within the ARPA, there is a slight chance of impacts due to the low likelihood of it occurring. If this species is found within the ARPA in the future, the specific sites where it is found shall be avoided to prevent any potential impacts.

## 4.2 Colorado River Species

Four federally endangered fish species might occur as downstream residents of the Colorado River system: Colorado pikeminnow, bonytail, humpback chub, and razorback sucker (USDI-FWS 2004a). All four of these fish species share similar habitat requirements and historically occupied the same river systems. Declines in populations of these species are mainly attributed to impacts of water development (e.g., dams and reservoirs) on natural temperature and flow regimes, creation of migration barriers, habitat fragmentation, the introduction of competitive and predatory non-native fishes, and the loss of inundated bottom lands and backwater areas (Minckley and Deacon 1991 and USDI-FWS 1993).

Under the Proposed Action and the proposed alternatives, no produced water will be discharged to the Colorado River system; therefore, produced water discharges do not pose a risk to these

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species. Implementation of all appropriate mitigation measures for water resources and soils identified in the ARPA would prevent potential downstream sedimentation and contamination caused by construction activities. Therefore, water quality in the Colorado River system is not expected to be impacted by the Proposed Action.

Limited water depletions within the Colorado River system are expected from drilling activities within the ARPA. Water depletion from the Colorado River system as a result of road/pad construction and dust abatement would be approximately 10.3 acre-feet per year for the entire project area. Water depletions to the Colorado River system as a result of this project might adversely affect these four fish species. This determination is based on the Recovery and Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, which was initiated on January 22, 1988.

The recovery program was intended to be the reasonable and prudent alternative that avoided jeopardy to the endangered fish by depletions from the upper Colorado River. The recovery program required that a depletion fee be paid to help support the recovery program if a project results in depletion. On July 5, 1994, the USFWS issued a biological opinion determining that the fee for depletions of 100 acre-feet or less would no longer be required. This opinion was based on the premise that the recovery program has made sufficient progress as the reasonable and prudent alternative and therefore avoided the likelihood of jeopardy to the endangered fishes and destruction or adverse modification of their critical habitat by depletions of 100 acre-feet or less.

Because water depletion due to this project is less than 100 acre-feet per year, a mitigation fee would not be applicable.

### 4.3 Platte River Species

The whooping crane, interior least tern, piping plover, Eskimo curlew, pallid sturgeon, and western prairie fringed orchid are all found downstream of the ARPA along the Platte River. No habitat for any of these species occurs on the ARPA and they are not likely to occur there. Under the Proposed Action and the proposed alternatives, no produced water will be discharged to the Platte River system; therefore, produced water discharges do not pose a risk to these species. Implementation of all appropriate mitigation measures for water resources and soils identified in the ARPA would prevent potential downstream sedimentation and contamination caused by construction activities. Therefore, water quality in the Platte River system is not expected to be impacted under the Proposed Action and the proposed alternatives. No water depletion from the Platte River system will occur as a result of the proposed project.

## 5 Cumulative Impacts

The cumulative impact analysis (CIA) approach is used to evaluate the influences of recent, past, present, and reasonably foreseeable future human developments on the local wildlife biological resources. This approach examines impacts associated with a proposed project in context with all other past and future developments, whether or not they are related. It also allows the wildlife manager and land management agency to evaluate impacts on a broader scale. The BLM recommends evaluating cumulative impacts on a watershed basis for natural resources related to watershed function and stability.

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Existing disturbance within the ARPA is approximately 763 acres or around 0.28 percent of the 270,080 acres of the project area. During the construction phase, the Proposed Action would disturb up to 15,800 acres or 5.9 percent of the overall project area, Alternative A (no action) would not disturb any acreage, Alternative C is estimated to disturb approximately 13,286 acres (4.9 percent of the ARPA), and Alternative D would disturb up to 13,000 acres (4.8 percent of the ARPA) with a cap of 7,600 acres of unreclaimed disturbance at any one time. Disturbance areas within the ARPA would be reduced upon reclamation of pipeline right-of-ways, unused portions of the drill pad, portions of roads, and ancillary facility disturbances during the production phase for each alternative, resulting in long-term disturbance of about 6,200 acres under the Proposed Action and Alternative C, no additional acreage under Alternative A, and 5,000 acres under Alternative D.

### **5.1 Black-Footed Ferret**

Provided that avoidance measures outlined in this document are followed, the potential for an incremental increase in cumulative impacts due to the implementation of the Proposed Action or Alternatives C or D might affect the black-footed ferret, but is not likely to adversely affect the black-footed ferret.

### **5.2 Bald Eagle**

Bald eagles are not known to nest on the ARPA, but might use portions of the project area especially during winter months when carrion is available. Provided that avoidance measures outlined in this BA are followed, the potential for an incremental increase in cumulative impacts due to the implementation of the action alternatives (Proposed Action and Alternatives C and D) or Alternative A (No Action) might affect, but is not likely to adversely affect the bald eagle.

### **5.3 Blowout Penstemon**

Implementation of the Proposed Action and any of the alternatives is not expected to contribute cumulative impacts upon blowout penstemon due to a lack of confirmed occurrences of the species within the ARPA. Should surveys identify populations of blowout penstemon, such populations and associated habitats will be avoided.

### **5.4 Ute Ladies'-Tresses**

Implementation of the Proposed Action and any of the alternatives is not expected to contribute to cumulative impacts upon Ute ladies'-tresses due to a lack of confirmed occurrences of the species within the ARPA. Should surveys identify populations of Ute ladies'-tresses, such populations and associated habitats would be avoided.

### **5.5 Colorado River Species**

On July 5, 1994, the USFWS issued a biological opinion determining that the fee for depletions of 100 acre-feet or less would no longer be required. Cumulative impacts to the endangered fish species that are downstream of the ARPA in the Colorado River are expected to be less than 100 acre-feet per year from the project, under all of the alternatives.

### 5.6 Platte River Species

These species do not occur on the ARPA and no water depletions to the Platte River system are expected; therefore, implementation of the Proposed Action and any of the alternatives would not contribute to cumulative impacts upon these species.

## 6 Conservation Measures to Avoid or Reduce Adverse Impacts

The following procedures will be implemented to eliminate or substantially reduce potential adverse impacts of the proposed project to threatened, endangered, proposed, candidate, and petitioned species that might occur within or near the ARPA or that might be impacted by the project.

- If disturbance of prairie dog colonies located within the Dad Complex cannot be avoided, black-footed ferret surveys will be conducted according to USFWS guidelines (USDI-FWS 1989) if the affected towns meet the survey requirements.
- Well pads and disturbances shall be placed 50 meters outside of prairie dog colonies where feasible. In the non-block-cleared areas of the ARPA, any construction would require block surveys for the presence of black-footed ferrets. In those areas that are block-cleared, disturbance is limited to as few a burrows as possible.
- Should black-footed ferrets be documented in a prairie dog complex located within the project area, impacts to the species or its habitat shall be suspended immediately.
- The operators shall conduct educational outreach to employees regarding the nature, hosts, and symptoms of canine distemper and its effects on black-footed ferrets, focusing attention on why pets should be prohibited from work sites.
- All suspected observations of black-footed ferrets, their sign, or carcasses on the ARPA, however obtained, shall be promptly (within 24 hours) reported to the BLM and USFWS.
- All drivers shall undergo a training session describing the type of wildlife in the area that are susceptible to vehicular collisions in order to reduce the potential for vehicle-big-game collisions and subsequent jeopardy to bald eagles feeding on road-killed carrion. The operators shall discuss the circumstances under which such collisions are likely to occur and the measures that could be employed to minimize them. Reduced speed limits shall be implemented to reduce potential for vehicle-wildlife collisions.
- Carcasses shall be removed from access roads, shoulders, and right-of-ways to minimize bald eagle exposure to vehicles.
- Remote monitoring of project facilities would be utilized to the extent possible to reduce human activity levels within the gas field during the production phase.

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- All appropriate sedimentation, erosion control, and produced water control measures included in the record of decision will be implemented to avoid changes in water quality or quantity in the streams within the ARPA.
- Construction equipment fueling and servicing areas shall be located at least 150 feet from surface water drainages and riparian areas and away from slopes that drain into those areas.
- High construction standards and rigid safety precautions that adhere to approved design criteria shall be implemented to minimize the potential for an accidental spill or discharge of any chemical or petroleum product into surrounding watershed systems.
- As a safety measure, buffer zones of undisturbed vegetation along water courses shall be maintained to inhibit transport of potentially contaminated runoff to surface waters.

### 7 Effects of the Project on the Expected Status of Species in the Future

Provided that the conservation measures described above are implemented, the Proposed Action and alternatives are not expected to alter the current status of, or result in any decreased survival of, any of the species discussed in this BA during the project or after project completion.

### 8 Determination of Effects for Listed Species

#### 8.1 Black-Footed Ferret

Based upon the analyses of the alternatives, the current and potential status of the species in the project area, other land use activities in the area, and incorporation of the conservation measures recommended in this BA, it is concluded that implementation of the alternatives **might affect**, but is **not likely to adversely affect** the black-footed ferret.

#### 8.2 Canada Lynx

Based on the lack of suitable habitat in the project area, it is unlikely that lynx would occur on the ARPA. Therefore, the alternatives would have **no effect** on the Canada lynx.

#### 8.3 Preble's Meadow Jumping Mouse

Based upon the known distribution of the Preble's meadow jumping mouse, it is extremely unlikely that they would occur on the ARPA. Therefore, the alternatives would have **no effect** on the Preble's meadow jumping mouse.

#### 8.4 Bald Eagle

Based upon the analyses of the alternatives, the current and potential status of the species in the project area, other land use activities in the area, and incorporation of the conservation

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measures recommended in this BA, it is concluded that implementation of the alternatives **might affect**, but is **not likely to adversely affect** the bald eagle.

### 8.5 Wyoming Toad

Based upon the known and historic distribution of the Wyoming toad, it is extremely unlikely that it would occur on the ARPA. Therefore, the alternatives would have **no effect** on the Wyoming toad.

### 8.6 Blowout Penstemon

Based upon the analyses of the alternatives, the current status of these species, other land use activities in the area, and incorporation of the conservation measures recommended in this BA, it is concluded that implementation of the alternatives **might affect**, but is **not likely to adversely affect** blowout penstemon.

### 8.7 Ute Ladies'-Tresses

Based upon the analyses of the alternatives, the current status of these species, other land use activities in the area, and incorporation of the conservation measures recommended in this BA, it is concluded that implementation of the alternatives **might affect**, but is **not likely to adversely affect** Ute ladies'-tresses.

### 8.8 Colorado Butterfly Plant

Based upon the known distribution of the Colorado butterfly plant, it is extremely unlikely that it would occur on the ARPA. Therefore, the alternatives would have **no effect** upon the Colorado butterfly plant.

### 8.9 Colorado River Species

On July 5, 1994, the USFWS issued a biological opinion determining that the fee for depletions of 100 acre-feet or less would no longer be required. Impacts to the endangered fish species that are downstream of the ARPA in the Colorado River are expected to be less than 100 acre-feet per year, under the Proposed Action and any of the alternatives.

The Colorado pikeminnow, bonytail, humpback chub, and razorback sucker do not occur on the ARPA. However, the minimal water depletions to the Colorado River system that might occur would impact these species. Therefore, it is concluded that implementation of the Proposed Action and any alternatives is likely to adversely affect these fish species.

### 8.10 Platte River Species

The whooping crane, interior least tern, piping plover, Eskimo curlew, pallid sturgeon, and western prairie fringed orchid do not occur on the ARPA and no water depletions to the Platte River system would occur. Therefore, it is concluded that implementation of the Proposed Action and any of the alternatives would have **no effect** upon these species.

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