



United States  
Department of  
Agriculture

Forest  
Service

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# Environmental Assessment

## Black Thunder Mine Little Thunder Creek Diversion

**Douglas Ranger District,  
Medicine Bow-Routt National Forests and Thunder Basin National  
Grassland  
Campbell County, Wyoming**

Legal Description:   Section 22, T43N, R71W  
                                  Sections 23, 26, & 27, T43N, R70W

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## **SUMMARY**

The Forest Service is proposing to authorize Thunder Basin Coal Company to construct two hydrologic structures on Little Thunder Creek. The first structure hereby called the Little Thunder Blocking Dike (Sec 22, T43N, R71W) would intercept Little Thunder Creek flows immediately below the Little Thunder Reservoir and divert the flows to the north to tie in with the existing Thundercloud diversion within Management Area 6.1 (Rangeland with Broad Resource Emphasis.) The Blocking dike will be approximately 14 feet tall and 160 feet wide. 1000 feet of diversion will be constructed on federal land. The structure will impact approximately 3.6 acres. Structure life is anticipated through 2023, which is the life of the mine. This structure will be reclaimed during final mining reclamation.

The second structure, hereby called the East Diversion (Portions of Sec 23, 26, & 27, T43N, R70W) would bring diverted flows of Little Thunder Creek back to an existing sediment control structure on the east side of the Black Thunder Mine so that the flows can be routed through the sedimentation reservoir to ensure that the water quality of Little Thunder Creek is maintained within Management Area 8.4 (Minerals Production and Development.) Discharge from the sediment reservoir will flow back into the natural Little Thunder Creek channel. Approximately 4650 feet of the diversion will be constructed on Federal land. The structure will impact approximately 17.1 acres. The diversion will be in place until 2023 when it will be reclaimed and the flows returned to their reclaimed channels. Typical diversion construction will be 15 feet bottom width, approximately 10 feet deep. Both structures will be constructed using large earth moving equipment. Both diversion structures will impact a total of approximately 20.7 acres.

The project area is located approximately 15 miles southeast of Wright, Campbell County, Wyoming and is within the Douglas Ranger District, Medicine Bow-Routt National Forest and Thunder Basin National Grassland. Two hydrologic structures are proposed for construction at the Black Thunder Mine to provide required flood protection for the mine workers and equipment and to ensure that the water quality in the Little Thunder Creek is maintained. The current diversions that provide flood protection to the Black Thunder Mine will be mined through as the mine advances. There is a need to construct new diversion structures in advance of mine operations to replace the structures that will be removed.

The proposed action may increase streamflows and sedimentation along the Little Thunder Creek stream channel below the diversion and diminish wetland vegetation where water is diverted from the channel. It may impact individual sensitive wildlife. It is not expected to impact heritage, paleontological or plant resources. It is expected to maintain existing economies and social structures related to mining in the area.

In addition to the proposed action, the Forest Service also evaluated the no action alternative. Under the No Action alternative, current management plans would continue to guide management of the project area. No diversions on Little Thunder Creek would be implemented to accomplish project goals.

Based upon the effects of the alternatives, the Forest Supervisor will decide whether or not, and if so under what conditions, a Special Use Permit authorization will be issued to Thunder Basin Coal Company for the diversion structures.

# 1.0 INTRODUCTION

## Document Structure

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The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *Literature Cited:* This section provides a list of literature used as a basis for conclusions made in the document.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Douglas Ranger District Office in Douglas, Wyoming.

## 1.1 Purpose and Need for Action

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Two hydrologic structures are proposed for construction at the Black Thunder Mine to provide required flood protection for the mine workers and equipment and to ensure that the water quality in the Little Thunder Creek is maintained. The current diversions that provide flood protection to the Black Thunder Mine will be mined through as the mine advances. There is a need to construct new diversion structures in advance of mine operations to replace the structures that will be removed.

This action responds to the goals and objectives outlined in the Thunder Basin National Grassland Plan, and helps move the project area towards desired conditions described in that plan.

### **1.1.1 Existing Conditions.**

The project is in the administrative boundary of the Thunder Basin National Grassland, Douglas Ranger District.

The terrain in the project area is gently rolling open grasslands with defined ephemeral (temporary flow) drainages. The terrain is generally flat, with low-lying hills and knolls that are dissected by shallow creeks and drainages. The project is located in the Highlight Bill Geographic Area.

The Black Thunder mine has indicated that the existing diversion structures that currently keep water from flowing into the pit will be removed due to mining operations.

### **1.1.2 Desired Conditions**

The desired condition is to provide for safe conditions to allowing the coal mines to continue to mine the leased coal.

### **1.1.3 Land and Resource Management Plan**

#### **Geographic Area Direction**

##### ***Desired Conditions-Hilight Bill Geographic Area***

Minerals exploration and development and livestock grazing will be significant management activities in this geographic area. In some areas, there may be restrictions on public use to ensure public safety and to avoid unreasonable interference with mineral operations. In those areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition.

There will be more development and a moderate number of facilities in this geographic area. Facilities and landscape modifications will be visible but reasonably mitigated to blend with natural features. Higher fence densities and intensive mineral development may occur.

Mineral developments and facilities such as coal mines, railroads, oil and gas wells, and pipelines will be present and will often dominate the landscape.

Livestock grazing is the dominant land use. Recreational use, primarily big game hunting, also occurs. Little camping, hiking, or mountain biking have been observed as it occurs on the National Grasslands west of Highway 59.

## **Management Area Direction**

### ***8.4 Mineral Production and Development***

These areas are managed for solid mineral operations.

Mineral operations of all types are emphasized to effectively and efficiently remove available commercial mineral resources, concurrent with other ongoing resource uses and activities. Operations include development and production of solid minerals, such as coal, bentonite, uranium and hard rock, open-pit mines, stock-piled overburden and top soil, and various ancillary facilities. Facilities and landscape modifications are visible but are reasonably mitigated to blend and harmonize with natural features. Reclamation activities restore the area to a reasonable level of its pre-mining condition. Grazing will occur, except on areas being actively mined and areas under reclamation for bond release.

Restrictions on public use occur to ensure public safety and to avoid unreasonable interference with mineral operations. Visitors can experience frequent encounters with people, heavy equipment and noise.

#### **1.1.4 Purpose (Project Objectives)**

The purpose of the project is to allow for continued coal mining operations as identified in the Thunder Basin National Grassland Land and Resource Management Plan of 2001 (Grassland Plan) Chapter 1, Goals and Objectives, Goal 2, c: Improve the capability of the Nation's forests and grasslands to provide a desired sustainable level of uses, values, products, and services, Mineral and Energy resources Objective 2: Honor all valid existing legal mineral rights.

#### **1.1.5 Other laws and regulations**

The proposed project shall meet the requirements of Thunder Basin National Grassland Land and Resource Management Plan of 2001. The proposal shall comply fully with Forest wide standards and guidelines, the Hilight Bill Geographic Area Direction and the Management Area Direction, including that contained under Management Areas 5.12 and 8.4 (See Chapter 1, pages 9 through 31, Chapter 2 pages 2-8 and Chapter 3, page 26).

## **1.2 Proposed Action**

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The Forest Service is proposing to authorize Thunder Basin Coal Company to construct two hydrologic structures on Little Thunder Creek. The first structure hereby called the Little Thunder Blocking Dike (Sec 22, T43N, R71W) would intercept Little Thunder Creek flows immediately below the Little Thunder Reservoir and divert the flows to the north to tie in with the existing Thundercloud diversion within Management Area 6.1-Rangeland with Broad Resource Emphasis. The Blocking dike will be approximately 14 feet tall and 160 feet wide. 1000 feet of diversion will be constructed on federal land. The structure will impact approximately 3.6 acres. Structure life is anticipated through 2023, which is the life of the mine. This structure will be reclaimed during final mine reclamation.

The second structure, hereby called the East Diversion (Portions of Sec 23, 26, & 27, T43N, R70W) would bring diverted flows of Little Thunder Creek back to an existing sediment control structure on the east side of the Black Thunder Mine so that the flows can be routed through the sedimentation reservoir to ensure that the water quality of Little Thunder Creek is maintained. within Management Area 8.4-Minerals Production and Development. Discharge from the sediment reservoir will flow back into the natural Little Thunder Creek channel. Approximately 4650 feet of the diversion will be constructed on Federal land. The structure will impact approximately 17.1 acres. The diversion will be in place until 2023 when it will be reclaimed and the flows returned to their reclaimed channels. Typical diversion construction will be 15 feet bottom width, approximately 10 feet deep.

The East Diversion is scheduled to be constructed in January-March of 2007. The existing diversion is scheduled to be mined through in 2009, therefore construction of the Little Thunder Blocking Dike is scheduled for spring-summer 2008. Both structures will be constructed using large earth moving equipment. Both diversion structures will impact a total of approximately 20.7 acres.

The project area is approximately 15 miles southeast of Wright, Campbell County, Wyoming.

### **1.3 Decision Framework**

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Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions:

The Forest Supervisor will decide whether to authorize the construction of the diversions or not, and if so under what terms and conditions the construction can be completed.

### **1.4 Public Involvement**

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The proposal was listed in the Schedule of Proposed Actions on January 1, 2006. The proposal was provided to the public and other agencies for comment during scoping by letter to 61 individuals and organizations on April 11, 2006. In addition, as part of the public involvement process, the agency published a legal notice in the Laramie Boomerang on April 16, 2006. Comments were received from two individuals, one company and two state government agencies.

Using the comments from the public, and other agencies, (see *Issues* section), the interdisciplinary team developed a list of issues to address.

### **1.5 Issues**

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The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on

Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record.

As for significant issues, the Forest Service identified 5 topics raised during scoping. These issues include:

- Whether or not the project will impact livestock grazing, grazing permittees and economic and social impacts to livestock grazing, communities and agriculture production including watering facilities for livestock.
- Whether or not the project will have individual and cumulative impacts to resources including water quality and fisheries,
- Whether or not the project will have timely and successful reclamation and mitigation, including the potential for excessive erosion where water is released back into Little Thunder Creek.
- Whether or not the project will provide for flood control and protection for the miners
- Effects to the fishery in Little Thunder Reservoir by decreasing water levels or allowing fish to easily escape from the reservoir.



## 2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the Black Thunder Mine Little Thunder Creek Diversion project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative (i.e., helicopter logging versus the use of skid trails) and some of the information is based upon the environmental, social and economic effects of implementing each alternative (i.e., the amount of erosion or cost of helicopter logging versus skidding).

### 2.1 Alternatives ---

#### 2.1.1 Alternative 1

##### ***No Action***

Under the No Action alternative, current management plans would continue to guide management of the project area. No diversions on Little Thunder Creek would be implemented to accomplish project goals. This alternative does not meet the purpose and need for the project but is analyzed in full to provide a comparison for the other alternative.

#### 2.1.2 Alternative 2

##### ***The Proposed Action***

The Forest Service is proposing to authorize Thunder Basin Coal Company to construct two hydrologic structures on Little Thunder Creek. The first structure hereby called the Little Thunder Blocking Dike (Sec 22, T43N, R71W) would intercept Little Thunder Creek flows immediately below the Little Thunder Reservoir and divert the flows to the north to tie in with the existing Thundercloud diversion within Management Area 6.1-Rangeland with Broad Resource Emphasis. The Blocking dike will be approximately 14 feet tall and 160 feet wide. 1000 feet of diversion will be constructed on federal land. The structure will impact approximately 3.6 acres. Structure life is anticipated through 2023, which is the life of the mine. This structure will be reclaimed during final reclamation.

The second structure, hereby called the East Diversion (Portions of Sec 23, 26, & 27, T43N, R70W) would bring diverted flows of Little Thunder Creek back to an existing sediment control structure on the east side of the Black Thunder Mine so that the flows can be routed through the sedimentation reservoir to ensure that the water quality of Little Thunder Creek is maintained. within Management Area 8.4-Minerals Production and Development. Discharge from the sediment reservoir will flow back into the natural Little Thunder Creek channel. Approximately 4650 feet of the diversion will be

constructed on Federal land. The structure will impact approximately 17.1 acres. The diversion will be in place until 2023 when it will be reclaimed and the flows returned to their reclaimed channels. Typical diversion construction will be 15 feet bottom width, approximately 10 feet deep.

The East Diversion is scheduled to be constructed in January-March of 2007. The existing diversion is scheduled to be mined through in 2009, therefore construction of the Little Thunder Blocking Dike is scheduled for spring-summer 2008. Both structures will be constructed using large earth moving equipment. Both diversion structures will impact a total of approximately 20.7 acres.

The project area is approximately 15 miles southeast of Wright, Campbell County, Wyoming.

### **2.1.3 Alternatives Considered But Eliminated from Detailed Study**

#### Diversion from Little Thunder Reservoir Spillway to Existing Thundercloud Diversion

Based on a comment from the public, we considered increasing the height of the Little Thunder Reservoir and extending the spillway to tie into the existing Thundercloud Diversion. This alternative was dropped from further analysis because the existing diversion will be mined through and needs to be replaced and using the reservoir would impact use of the reservoir by the public.

Figure 1: Map of Proposed Action



## 2.2 Design Criteria Common to All Alternatives

In response to public comments on the proposal, design criteria were developed to ease some of the potential impacts the various alternatives may cause. The design criteria may be applied to any of the action alternatives.

### 2.2.2 Heritage

The discovery of any and all antiquities or other objects of historic or scientific interest, including but not limited to, historic or prehistoric ruins, or artifacts as the result of operations under this plan shall immediately be brought to the attention of the District Ranger. The permittee shall cease operations until authorized to proceed by the District Ranger.

### 2.2.3 Hydrology (Watershed)

Standard best management practices (BMPs) outlined in the Watershed Conservation Practices (WCP) Handbook (FSH 2509.25) (USDA Forest Service, 2005) are recommended for inclusion in the selected alternative to ensure compliance with State of Wyoming Water Quality Standards and Wyoming Nonpoint Source Management Plan (WYDEQ, 2000). The following design criteria are site specific measures designed to meet the intent of the Clean Water Act. These design criteria are recommended for inclusion in the decision to ensure the project meets the applicable legal requirements.

- Ensure the small impoundment in Section 10 at the north end of the Little Thunder Blocking Dike is properly engineered to be able to withstand the increase in flood flows.
- Install a bypass flow structure to divert maintenance flows down Little Thunder Creek below the reservoir to maintain wetlands and vegetation in the section of stream channel that will likely not be affected by coal mining.
- Ensure the West Diversion meets State of Wyoming and National Dam Safety Standards.
- Obtain all necessary permits, including any needed water rights for impounding additional water for flood control from the Wyoming State Engineer's Office.
- Maintain recreational access and infrastructure at Little Thunder Reservoir.
- Maintain a recreational fishery in Little Thunder Reservoir.
- At the East Diversion, a bypass flow structure should be installed so that flows similar to existing conditions are retained in North Prong Creek downstream of the diversion.

- If it is determined that Little Thunder Reservoir is losing an unacceptable number of fish downstream during high flows, install mechanisms to prevent loss of fish downstream from Little Thunder Reservoir.
- All wetlands outside of current or proposed lease areas should be retained in kind through diverting periodic maintenance flows down Little Thunder Creek below the reservoir and North Prong Creek below the East Diversion.
- When this diversion is reclaimed, restore Little Thunder Reservoir and affected stream channels to pre-diversion conditions.
- Flows in North Prong Creek below where the West diversion and in Little Thunder Creek below the East diversion will be limited to a volume less than or equal to the naturally occurring mean annual peak flow (roughly equivalent to a peak generated by a 2-year, 24 –hour storm event) and which can be handled by the natural channel.

#### **2.2.4 Paleontology**

- The discovery of any and all fossils as the result of operations under this plan shall immediately be brought to the attention of the District Ranger. The permittee shall cease operations at the site of discovery until authorized to proceed by the District Ranger

#### **2.2.5 Range Design**

- If livestock movements cause drifting to occur between the Little Thunder Blocking Dike and Little Thunder Reservoir a fence may be constructed.

#### **2.2.7 Wildlife**

- To help protect R2 Sensitive Species USFS may ask that the operator notify the District Ranger, Douglas Ranger District, if a sensitive species nest, winter roost, or den in addition to any identified in this Biological Evaluation is located during construction or operation of the project.
- To help prevent abandonment, reproductive failure or nest destruction, prohibit development of new facilities within 0.5 mi (line of sight) of active golden eagle nests. For the golden eagle, a nest is no longer considered active if it is known to have been unoccupied for the last 7 years. This does not apply to pipelines, fences and underground utilities.
- To help reduce disturbances to nesting golden eagles, prohibit construction and reclamation within the 0.5 mile (line of sight) of active golden eagle nests from 1 February to 31 July.

## 2.3 Monitoring

The following monitoring is recommended for inclusion in the selected alternative.

- Work with the Wyoming Game and Fish Dept. to monitoring fish populations and aquatic habitat in Little Thunder Reservoir.
- Monitor condition of stream channels below diversions for evidence of erosion quarterly during the first year, annually in subsequent years and after storm events greater than the 2 year, 24-hour storm. If erosion is noted, erosion control measures, and/or reduction of discharge rates should be implemented to reduce erosion rates to pre-diversion conditions.
- Monitor wetlands along Little Thunder Creek below the reservoir and North Prong Creek below the East Diversion to determine if wetlands are being maintained.
- Monitor livestock movements near the Little Thunder Blocking Dike and Little Thunder Reservoir and if drifting occurs a fence may be needed.

## 2.4 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

**Table 1: Comparison of Effects by Resource**

	Alternative 1	Alternative 2
Botany	No Impact	No Effect to any T&E species, No Impact to any R2 Sensitive species or Species of Local concern
Heritage	No Impact	No adverse effects.
Hydrology	No Impact	Will effect amount and timing of flows in streams and reduce wetlands until mining is completed. Increased sedimentation due to higher flows are likely.
Paleontology	No Impact	No effects.
Social and Economics	Could impact jobs, economy and social structure if mining could not continue	No impact to economy and social structure as mining would continue.
Wildlife	No Impact	No Effect to T&E species, May Impact Individuals for R2 Sensitive species, No loss of viability for MIS species, May impact individuals for Other Species of Concern

### 3.0 ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

#### Cumulative Effects

Cumulative effects are defined under Council of Environmental Quality 1508.7 “the impact on the environment which results from incremental impact of the action added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

Included in the cumulative effects analysis are the effects of future activities identified within the cumulative effects areas for each resource. The cumulative effects area varies depending on the resource and issue. There the future activities included in each cumulative effects analysis would also vary.

The following table is a summary of cumulative effects for the analysis area. Part or all of these activities would be used by the specialists in their cumulative effects report, depending on which activity (ies) affects their resource.

Table 2: Past Present and Reasonably Foreseeable Future Actions

(Present date is Spring 2008)

PAST	PRESENT	FUTURE
Dispersed recreation	Dispersed recreation	Dispersed recreation
Grazing and Range Improvements	Grazing and Range Improvements	Grazing and Range Improvements
Roads	Roads	Roads
Fire	Fire	Fire
Railroad	Railroad	Railroad
Relocation of roads	Relocation of roads	Relocation of roads
Gravel pit	Gravel pit	Gravel pit
Special uses	Special uses	Special uses
1. Coal Mine	Coal Mines	Coal Mines
2 Oil Wells	Oil Wells	Oil Wells
3. Oil and gas leasing		4. Travel management
		5. Ferret Introduction

**Dispersed Recreation:** Use all year light, heavy in hunting season (Sept to Nov.). Activities are 4-wheeling, camping, scenic and wildlife viewing, trapping, hiking, train spotting, and horseback riding. 500 dispersed camping sites. No system trails or developed recreation areas.

**Fire:** Historically, wildfires from both natural and human sources have gone through the area. These range in size from less than 0.25 acres up to 5,000 acres with the majority of these being less than 500 acres. All wildfires are aggressively attacked. Some prescribed burning on private land currently. FS has prescribed burned in the past.

**General Range Improvements:** 20 miles of fenceline and approximately 20 manmade water sources

**General Oil and Gas:** The wells started to be drilled in 1953 on Forest Service (FS) lands and 1924 on adjacent lands. Currently: There are 6 active wells in the project area (including non FS lands. Future: There are no proposed wells in the project area.

**Grazing:** The grazing association is authorized to graze 70,659 AUM's; most allotments are all year long through the system of pastures including private and state lands.

**History:** Homesteaded in the 20th century, some ranching or small gain farms. Drought in 1920's and 1930's, in part caused many homesteads to fail. Cattle grazing remained steady, while sheep grazing decreased since the 1960's.

**Non-FS Ownership:** Surrounding area land owners are mostly ranchers. Also a large amount of adjacent land is involved in oil and gas or coal mining.

**Railroad:** Future railroad construction in the project area includes the Dakota Minnesota and Eastern Railroad-Powder River Expansion Project.

**Roads:** Generally this area has high road density. Locally it is rated high around oil, gas, and coal mining areas. The RAP for the grasslands predicts 31.5 miles of road construction for oil and gas. Roads around the mine would be mined through and relocated. The mines would abandon 29 miles of roads, construct 6.8 miles, upgrade 3.1 miles and pave 7.3 miles.

**Special Uses:** There are currently 5-10 miles of existing oil and gas pipeline and 5-10 miles of electrical utility lines in the project area.

**Social and Economic:** Trend in the area is moving from a ranching type community to an energy based community. Drought conditions may reduce the ranching economics.

**Wildlife Trends:** See the wildlife report.

**1. A. Antelope Mine.** Started in 1982. 1,823 acres on FS, cumulative acres are 5,581 on both FS and non-FS land. Location is T41N, R71W; T40N, R71W; T41N, R70W; T40N, R70W.

**B. Black Thunder Mine.** Started in 1967. The FS acres are 6, 134 and the cumulative are 12,198 acres. Location is T43N, R70W; T42N, R70W; T43N, R71W.

**C. Jacobs Ranch Coal Mine.** Start date in 1975. 633 acres on FS, cumulative effect acres are 8,844. Location is T44N, R71W; T44N, R70W; T43N, R70W; T43N, R69W.

**D. North Rochelle (School Creek) Coal Mine.** T42N, R71W and R70W. Minerals, contact Mike Fracasso. Implementation 10/2004. Develop 12, 474 acres of disturbance on TBNG, 23,039 total cumulative acres. Started in 1985. Location is T43N, R71W; T43N, R70W; T42N, R71W; T42N, R70W; T42N, R69W.

**E. North Antelope-Rochelle Coal Mine.** Started in 1981. The FS acres are 22,815 and the cumulative effected acres are 11,956. Located in T42N, R71W; T42N, R70W; T42N, R69W; T41N, R71W; T41N, R70W; T41N, R69W.

**2. A. Gulf Oil Wells Federal #4-27 and #8-28.** Implementation-on hold. Drill, develop, and operate 2 conventional oil wells. T41N, R68W, Section 27.

**B. Gulf oil wells federal #15-21, 4-27 relocated.** T41N, R68W, Section 22. Implementation-spring 2004. Drill, develop and operate 2 conventional oil wells.

**3. Thunder Basin National Grassland Oil and Gas Leasing-West of Wyodak Coal Outcrop.** All grasslands, except Spring Creek. Land west of Wyodak Coal Outcrop is available for oil and gas.

**4. Thunder Basin National Grasslands Travel Mgt.** Implementation 2009. Analysis the whole grasslands for roads and motorized trails (none currently) possibilities and designation.

**5. Ferret Introduction**-EIS in progress. Implementation in 2009.

## 3.1 Botany

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### 3.1.1 THREATENED, ENDANGERED, AND PROPOSED SPECIES CONSIDERED IN THE ANALYSIS

Threatened, Endangered, and Proposed vegetation species, or their habitats, that are located on the Douglas Ranger District of the Medicine Bow-Routt National Forest, Thunder Basin National Grassland (MBRTB), or that area located adjacent to or downstream of the project area and could potentially be affected, were considered in this analysis. The 2006 MBRTB Threatened and Endangered Plant Species List for the Thunder Basin National Grassland (TBNG), as presented by the document titled "Pre-field Review of Threatened and Endangered, Sensitive and Local Concern Plant Species" dated April 4, 2006, listed two species, *Gaura neomexicana* ssp. *coloradensis* (Colorado butterfly plant) and *Spiranthes diluvialis* (Ute Ladies' Tresses Orchid), as requiring analysis. The Ute Ladies' Tresses Orchid species was analyzed in the 2005 Black Thunder Mine (BTM) Biological Evaluation/Botany (Umbrella) report (BKS Environmental 2006).

The USFS list identifies the Colorado butterfly plant as a threatened plant species that is possibly located on the TBNG. The known occurrences of the Colorado butterfly plant are located in Laramie and Platte Counties in Wyoming (USFWS 2004). The Colorado butterfly plant is typically found at elevations of 5,000-6,400 feet, in sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms, and old abandoned stream channels with a high water table (CPC 2006b).

A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and to determine whether field reconnaissance was needed to complete the analysis. Sources of local and regional information included USFS records and files (provided by Kathleen Roche, MBRTB Supervisor's office in Laramie, WY 2006), the Wyoming Natural Diversity Database (WYNDD), Appendix D8 Baseline Vegetation reports from BTM, previous wetland delineations and Ute Ladies' Tresses Orchid surveys for BTM, and scientific literature currently available. As directed from USFS Deputy District Ranger, Misty Hays, a

review of baseline survey data to determine if any species were documented should be used to identify if the species needs to be field surveyed (Hays 2006).

The pre-field review found that site visits were not required as the Colorado butterfly plant was not previously found in any baseline vegetation report, Ute Ladies' Tresses Orchid report, or wetland delineation report for all or part of the project area.

**Table 3: Summary of Threatened and Endangered Species Potentially Occurring in the 2006 Amendment BTM Umbrella Project Area**

Scientific Name	Common Name	Status	Known/Suspected To Be Present	Suitable Habitat Present	Rationale If Not Carried Forward For Analysis
<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	Colorado butterfly plant	Threatened <sup>1</sup>	Possibly <sup>2</sup>	Yes	Species not identified in previous vegetation and wetland reports for the project area
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses Orchid	Threatened <sup>1</sup>	Suspected <sup>3</sup>	Yes	Discussed in the 2005 Umbrella BA/BE

<sup>1</sup>Classified as "Threatened" under the U.S. Endangered Species Act of 1973.

<sup>2</sup>Known populations in Laramie County, Wyoming (CPC (b) plant profile).

<sup>3</sup>Known population in northern Converse County (WYNDD records).

## V. ANALYSIS OF EFFECTS – THREATENED, ENDANGERED, AND PROPOSED SPECIES

The project area boundary defines both the Endangered Species Act (ESA) action area and the NEPA affected area for the Proposed Action Alternative. The GRASSLAND PLAN identified the goals of no impact to populations and minimized disturbance of potential habitat areas whenever possible. Based on a lack of suitable habitat throughout the majority of the project area and minimal acreage impacts to potential habitat areas, the goals of the GRASSLAND PLAN are met by the Proposed Action Alternative.

### 3.1.2 SENSITIVE SPECIES CONSIDERED IN THE ANALYSIS

Sensitive species, or their habitats, that are located on the Douglas Ranger District of the MBRTB, or that are located adjacent to or downstream of the project and could potentially be affected, were considered in this analysis. The 2006 MBRTB Sensitive Plant Species List identified the species listed in Table 4 as 2006 R2 List species of documented or suspected occurrence on the TBNG.

A pre-field visit review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and to determine whether field reconnaissance was needed to complete the analysis. Sources of local and regional information included USFS records and files (provided by Kathleen Roche, MBRTB SO, Laramie, WY April 2006), the Wyoming Natural Diversity Database (WYNDD), baseline vegetation reports from BTM, previous wetland delineations and Ute Ladies' Tresses Orchid surveys for BTM, and scientific literature currently available. As directed from USFS Deputy District Ranger, Misty Hays, a review of baseline survey data to determine if any species were documented should be used to identify if the species needs to be field surveyed (Hays 2006).

The 2005 BTM Umbrella report covered seven of the 13 sensitive species on the 2006 list. *Astragalus barrii* (Barr's milkvetch), *Botrychium campestre* (Prairie moonwort), *Carex alopecoidea* (Foxtail sedge), *Carex leptalea* (Bristly-Stalk Sedge), *Eriogonum visheri* (Visher's buckwheat), *Penstemon laricifolius ssp. exilifolius* (Larchleaf beardtongue), *Physaria didymocarpa var. lanata* (Woolly twinpod), and *Viburnum opulus var. americanum* (Highbush-cranberry) were presented and analyzed in the BTM Umbrella 2005 report. The 2006 BTM Umbrella Amendment will present and discuss the additional six species added to the TEPS list: *Botrychium lineare* (Narrow-leaved moonwort), *Botrychium multifidum var. coulteri* (Leathery grapefern), *Eriogonum exilifolium* (Slender leaved buckwheat), *Festuca hallii* (Hall fescue), *Penstemon harringtonii* (Harrington's beardtongue), and *Potentilla rupincola* (Front Range cinquefoil).

No further analysis is required for species that are not known or suspected to occur within the project area, and for which no suitable habitat is present. The additional six species are not known to occur within the project area, within the county, or within surrounding counties, and suitable habitat was absent for four of the six species within the project area. *Botrychium multifidum var. coulteri* and *Eriogonum exilifolium* both had potential suitable habitat present but were not found during previous vegetation and wetland surveys in and around the project area.

Information presented in Table 4 was based upon floristic surveys and available records (Anderson 2004, 2005, 2006; Barton and Crispin, 2004; Dorn 2001; Fertig 2000; Panjabi and Anderson 2006; Reyher 2006; Ebertowski 2005; and USDA 2006.)

**Table 4: Analysis Rationale and Summary for Sensitive Plant Species Potentially Occurring in the 2006 Amendment BTM Umbrella Project Area**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Status</b>	<b>Presence</b>	<b>Suitable Habitat</b>	<b>Rationale If Not Carried Forward For Analysis</b>
<i>Botrychium lineare</i>	Narrow-leaved moonwort	Sensitive Species	Possibly	No	Not known to occur in Weston, Campbell, or Converse counties.
<i>Botrychium multifidum var. coulteri</i>	Leathery grapefern	Sensitive Species	Possibly	Yes	Not known to occur in Weston, Campbell, or Converse counties.
<i>Eriogonum exilifolium</i>	Slender leaved buckwheat	Sensitive Species	Possibly	Yes	Not known to occur in Weston, Campbell, or Converse counties.
<i>Festuca hallii</i>	Hall fescue	Sensitive Species	Possibly	No	Not known to occur in Weston, Campbell, or Converse counties.
<i>Penstemon harringtonii</i>	Harrington's beardtongue	Sensitive Species	Possibly	No	Not known to occur in Weston, Campbell, or Converse counties.
<i>Potentilla rupincola</i>	Front range cinquefoil	Sensitive Species	Possibly	No	Not known to occur in Weston, Campbell, or Converse counties.

## VII. ANALYSIS OF EFFECTS AND DETERMINATIONS SENSITIVE SPECIES

Implementation of the proposed action will have “no impact” on the presence of the Leathery grapefern and Slender leaved buckwheat or other USFS-listed Sensitive species within the project area due to the absence of known populations. Potential habitat does exist for Leathery grapefern and Slender leaved buckwheat, but habitat was not found to support individual plants or populations based on previous vegetation and wetland surveys for all or part of the project area. Table 5 presents a summary of biological effects and environmental consequences of the proposed action to the USFS sensitive species potentially occurring in the 2006 Amendment BTM Umbrella Project Area.

**Table 5: Summary of Biological Determinations and Environmental Consequences under the Proposed Action to USFS Sensitive Species Potentially Occurring in the 2006 Amendment BTM Umbrella Project Area**

Common Name	Scientific Name	Status	Suitable habitat present?	Determination of Effect, Environmental Consequences
Leathery grapefern	<i>Botrychium multifidum var. coulteri</i>	Sensitive Species	Yes	No impact, no individuals located within the project area, thus no reduction in numbers. There will be reduction in potential habitat.
Slender leaved buckwheat	<i>Eriogonum exilifolium</i>	Sensitive Species	Yes	No impact, no individuals located within the project area, thus no reduction in numbers. There will be reduction in potential habitat.

## VIII. RECOMMENDED CONSERVATION MEASURES TO AVOID, MINIMIZE, OR MITIGATE ADVERSE EFFECTS

No potential adverse effects to TEPS species exist from the proposed action, due to lack of the presence of population establishment in potential habitat.

## IX. SUMMARY OF ALL FINDINGS

No Threatened, Endangered, Proposed or Sensitive species will be affected within the project area, and no mitigation or monitoring is required for any of the survey species. A determination of “no effect” or “no impact” was made for all species considered having potential habitat. See Table 6 for a tabular summary of findings by species.

**Table 6: Cumulative Summary of Effects to TEPS Species for the 2006 Amendment BTM Umbrella Project Area**

Common Name	Scientific Name	Species Status	Mitigation Measures (required and recommended)	Monitoring Required <sup>1</sup>	Determination of Effect
Colorado butterfly plant	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>	Threatened species	None	NA	No effect
Leathery grapefern	<i>Botrychium multifidum</i> var. <i>coulteri</i>	Sensitive species	None	NA	No impact
Slender leaved buckwheat	<i>Eriogonum exilifolium</i>	Sensitive species	None	NA	No impact

<sup>1</sup>Monitoring is only required for mitigation areas.

### 3.1.3 Species of Local Concern (SLC)

The TBNG identified SLC using the process documented in the Rocky Mountain Regional Planning Desk Guide, Chapter 27 (USDA Forest Service 2003). Wyoming Natural Diversity Database (WYNDD) has identified plants of concern for Wyoming based upon occurrence and distribution within the state (Fertig and Heidel 2002). This list was used to determine which species of local or special concern within the state occur on the TBNG. State species abstracts and information from the Rocky Mountain Herbarium on plant distribution within Wyoming were used, when available, to determine which species has an extremely limited distribution on the TBNG. Each species was evaluated based upon isolation from other populations, lack of dispersal mechanisms, population trends, habitat trends, habitat vulnerability, and species life history and demographic characteristics (Roche and Proctor 2003).

The plant species list in the report (Table 1-BKS, 2006) has been identified as being those for which population viability is a concern on the TBNG, as evidence by:

- A significant current or predicted downward trend in population numbers or density, or
- A significant current or predicted downward trend in habitat capability that would reduce a species' existing distribution on the TBNG (Forest Service Manual (FSM) 2670.5)

### LOCAL CONCERN SPECIES EVALUATED IN THIS REPORT

Table 1 from the report (BKS, 2006) lists SLC for the Medicine Bow-Routt National Forests (MBR) and the TBNG. Not all species listed are considered to be of local

concern for the project area. The plants that are biologically likely and geographically likely to occur were identified prior to rare plant surveys. The biological and geographically likelihood of occurrence was determined based upon floristic surveys and available records (Dorn 2001; Fertig 1999, 2000, and 2001; Larson and Johnson 1999; Center for Plant Conservation; Ebertowski 2005, 2002-2003; and USDA Plants). The species that are not likely to occur, either biologically, geographically, or both, are shown with a strike-through in the text in Table 1 from the report. Based on this preliminary review the following species shown in Table 7 were analyzed in more detail.

**Table 7: Distribution, Status, and Environmental Baseline for Species of Local Concern**

Scientific Name (Common Name)	County	Managed Areas	Range Context <sup>1</sup>	Occurrence <sup>2</sup>	Abundance <sup>3</sup>	Historic Trends <sup>4</sup>	Recent Trends <sup>4</sup>	Intrinsic Vulnerability <sup>5</sup>	Wyoming Contribution Rank <sup>6</sup>
<i>Carex sartwellii</i> var. <i>sartwellii</i> (Sartwell's sedge)	Albany Crook Weston	Black Hills NF Medicine Bow NF	Disjunct	Very Low	Unknown	Unknown	Unknown	Moderate	High
<i>Lilium philadelphicum</i> (Wild lily)	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Palafoxia rosea</i> var. <i>macrolepis</i> (Rosy palafox)	Converse, Goshen	Rawhide Wildlife Habitat Mngt. Area Thunder Basin National Grassland	Disjunct	Very low	Unknown	Unknown	Unknown	NA	Medium
<i>Pectis angustifolia</i> (Crown-seed-fetid-marigold)	Converse, Goshen	Thunder Basin National Grassland	Disjunct	Very low	Unknown	Unknown	Unknown	NA	Low

<sup>1</sup>Range Context – the extent and position of a taxon’s continental range relative to WY.

Widespread – continental range is much larger than the state of WY

Edge – WY encompasses <50% of the continental range

Disjunct – WY populations are widely isolated (by about 300 mi or more) from the main, contiguous portion of the continental range

<sup>2</sup>Occurrences – number of extant (documented since 1970) and discrete reproductive populations of a rare plant in WY

Very Low – 1-5 occurrences

<sup>3</sup>Abundance – number of individuals, or area of occupied habitat of a rare plant in WY

Uncommon – 5,000-50,000 individuals or 500-5,000 occupied ac.

<sup>4</sup>Trend – change in number of individuals, occurrences, or area of occupied habitat. Historical refers roughly to the period 1850-1950. Recent generally refers to the period since 1950

Moderate decline - <50% decline in numbers, occurrences, or area

<sup>5</sup>Intrinsic vulnerability – the susceptibility of a taxon to decline due to inherent biological factors. Such factors include fecundity, population density, dispersal ability, pollinator limitations, competitive ability, likelihood of hybridization, and habitat specialization. Intrinsic vulnerability is scored with an emphasis on conditions in Wyoming that may represent a subset of rangewide conditions.

High – taxon restricted to 1 rare habitat type – OR – exhibits at least 2 of following characteristics: very low population density, very low dispersal ability, very low fecundity, pollinator limitations, predisposition to disease

Low – taxon occurs in a variety of habitat types (usually all within 1 biome) – OR – has no life history traits that predisposes it to declines resulting from moderate environmental changes

NA – No information available

Definitions defined by Wyoming Natural Diversity Database (Keinath et al 2003).

## ENVIRONMENTAL CONSEQUENCES

### **Direct and Indirect Effects to Local Concern Species Habitat**

#### **Alternative A: No Action**

Under the No Action Alternative, the proposed action (expanding coal resource recovery area) will not impose any direct or indirect effects to potential habitat areas for the Sartwell's sedge, wild lily, rosy palafox, and crown-seed-fetid-marigold. Coal Bed Methane gas production, grazing and recreation activities have the potential to continue within the project area, as well as in the surrounding area. The surrounding area would also remain subject to disturbance from future mining activities.

#### **Alternative B: Proposed Action**

Under the Proposed Action Alternative, the proposed action will not impose direct or indirect effects to Sartwell's sedge, wild lily, rosy palafox, and crown-seed-fetid-marigold populations as no populations exist in the area. Only potential habitat exists and may be affected.

#### **Cumulative Effects**

The Council of Environmental Quality defines cumulative impact as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such actions (40 CFR § 1508.7).

Endangered Species Act (ESA) defines “cumulative effects” to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. Federal actions that are unrelated to the proposed action are not considered because they require independent consultation pursuant to section 7 of the ESA (50 CFR § 402.02).

The Council on Environmental Quality approach to cumulative effects has been followed below because sensitive species require findings to be made for planning area.

Past and present on-going actions include fencing projects, power line construction, road construction, pipeline installation and removal, reservoir development, and drilling (for water monitoring, water production, and geological exploration), to full scale surface mining encompassing topsoil removal and stockpiling, overburden removal, mineral extraction, and reclamation.

Table 8 summarizes the cumulative effects (environmental consequences for the proposed action) upon the SLC on the TBNG.

### Cumulative Effects for Species of Local Concern with Potential Habitat in Project Area

The cumulative effects on the continued existence of Sartwell's sedge, wild lily, rosy palafox, and crown-seed-fetid marigold populations on the TBNG will be that of natural processes that may result in a slow change in the vegetation communities. The effect due to the proposed action would be minimal, due to the lack of either an established population or the identification of individual plants within the project area, though there will be some reduction in potential habitat by the proposed action.

**Table 8: Summary of Environmental Consequences for Proposed Action**

Scientific Name	Common Name	Status	Environmental Consequences	
			Proposed Action	No Action
<i>Carex sartwellii</i> var. <i>sartwellii</i>	Sartwell's sedge	Local Concern	No impact, the 1982 Mining and Reclamation Plan Permit Update report stated the species was found in a previous report, no recent surveys and reports identified the species as present in the project area. There will be some reduction to potential habitat.	No impact
<i>Lilium philadelphicum</i>	Wild lily	Local Concern	No impact, no individuals located within the project area. There will be some reduction to potential habitat.	No impact
<i>Palafoxia rosea</i> var. <i>macrolepis</i>	Rosy palafox	Local Concern	No impact, no individuals located within the project area. There will be some reduction to potential habitat.	No impact
<i>Pectis angustifolia</i>	Crown-seed-fetid marigold	Local Concern	No impact, no individuals located within the project area. There will be some reduction to potential habitat.	No impact

### Project Area- Population Viability for Species of Local Concern

Based on the best available information, no loss of viability for any species of local concern is expected from the proposed action because no individuals or populations are located within the project area based on previous vegetation and wetland surveys.

## 3.2 Heritage

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### 3.2.1 Affected Environment

Cultural resources are known to occur in the vicinity of the proposed transmission line corridor. A cultural resource survey of the area has been completed. Three archaeological sites are within the Area of Potential Effect. All of these, were previously determined not eligible by the Forest Service. These determinations have been concurred upon by the Wyoming State Historic Preservation Office.

### 3.2.2 Environmental Consequences

#### Alternative 1: No Action

There is no effect from the no action alternative, because there would not be any new ground disturbance.

#### Alternative 2: Proposed Action

The Project will have no adverse effects or cumulative effects on the eligible sites found in the project area. However, the following design criteria will apply:

- The discovery of any and all antiquities or other objects or historic or scientific interest, including but not limited to, historic or prehistoric ruins, or artifacts as the result of operations under this plan shall immediately be brought to the attention of the District Ranger. The permittee shall cease operations until authorized to proceed by the District Ranger.

## 3.3 Hydrology

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### 3.3.1 Affected Environment

#### Watershed Analysis Area

The Project area includes the watershed of Black Thunder Creek, which includes the Little Thunder Creek Watershed. This area lies within the Cheyenne River Watershed. As Table 9 displays, land ownership patterns are mixed within the Thunder Basin Grassland, NFS lands covering only a small portion of most watersheds. Cumulative effects from the proposed action and alternatives are analyzed primarily at the 5<sup>th</sup> level Hydrologic Unit Code (HUC) Watersheds<sup>1</sup>.

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<sup>1</sup> The HUC code is the interagency watershed code for these watersheds.

**Table 9: Watersheds with the Analysis Area<sup>2</sup>.**

HUC	HUC_NAME	NFS lands within watershed (acres / %)	Watershed Size acres
101201	<b>Cheyenne River Watershed (to beaver creek confluence)</b>	493,550 / 10%	4,889,156
10120103	Black Thunder Creek	122,395 / 34%	359,482
1012010303	Little Thunder Creek	61,547 / 38%	158,301

**Water Quality Standards:**

The majority of streams on Thunder Basin National Grassland, including Black Thunder and Little Thunder Creek within the project area are designated as Class 3B by the WYDEQ (WYDEQ, 2001). A subcategory of Class 3 waters, Class 3B waters are tributary waters including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to support communities of aquatic life including invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage of their life cycles (WYDEQ, 2001). The State of Wyoming 305(b) "State Water Quality Assessment Report and 2006 303(d) list of Waters Requiring TMDLs" (WYDEQ 2006) is the most current water quality assessment. None of the streams within the Black Thunder Watershed were listed as impaired in this report. The 2006 305b report is available at the following website: [http://deq.state.wy.us/wqd/watershed/Downloads/305b/2006/2006\\_305b\\_.pdf](http://deq.state.wy.us/wqd/watershed/Downloads/305b/2006/2006_305b_.pdf)

A Water quality assessment report is available for Antelope Creek, Black Thunder Creek and the Cheyenne River (Hargett, 2007), and is available from the WYDEQ website. This assessment found that these water bodies were fully supportive of all beneficial uses with the exception insufficient data to determine whether contact recreation and fish consumption uses were supported for Antelope Creek, Black Thunder Creek and the Cheyenne River. This report is available at the following website:

<http://deq.state.wy.us/wqd/watershed/Downloads/Monitoring/MonitoringReports/WatershedReportsMap.htm>

Additionally, the USGS has numerous water quality monitoring sites within the area. Water quality data can be obtained only through a query of the USGS National Water Information System Website for Wyoming (<http://nwis.waterdata.usgs.gov/wy/nwis/qw>).

**Floodplains, Wetlands, and Riparian Areas:** Floodplains exist on lands adjacent to the intermittent and ephemeral stream channels within the analysis area. Most floodplains in the smaller order drainages in the project area range from only a few feet wide to up to 50 feet wide. Floodplains, including adjacent wetlands are larger along sections of the main channel of Little Thunder Creek.

<sup>2</sup> Watersheds with land within the NFS boundary but without any NFS lands are not included in this table.

Wetlands have been mapped by the U.S. Fish and Wildlife Service (1991) under the National Wetland Inventory map program. The wetland maps are available in GIS for the main part of the Thunder Basin National Grassland.

The majority of the wetlands are classified as Palustrine (small shallow wetlands less than 8 hectares (ha) and/or less than 2 meters (m) deep). These wetlands are often associated with the stock reservoirs and spreader dikes in the analysis area and are located along the many small intermittent and ephemeral drainages.

**Lakes and Reservoirs:** Little Thunder Reservoir (22 acres in size) is the only lake in the project area. It was built to provide stock water in 1938, but also provides multiple benefits including waterfowl and wildlife habitat. The primary value of this lake is as a fishery and is stocked by the Wyoming Game and Fish Department. There are small stock reservoirs on NFS lands and sediment control ponds associated with the mining activity.

**Water Uses:** On NFS lands, the majority of the water use is for stock watering, primarily wells which supply water to one or more stock tanks. Other water uses include water used to support the coal mining and oil and gas operations in the area. Additionally, temporary water use permits have been issued to provide water for dust control during construction activities.

**Stream Channel Conditions:** Little Thunder Creek and North Prong Little Thunder are both ephemeral stream channels, which can have extended dry periods or have high flows in response to precipitation events. Little Thunder Creek, between Little Thunder Reservoir and Black Thunder Coal mine is a low gradient, highly meandering stream channel with seasonal wetland vegetation in areas along the channel. In recent years, the channel has more yearlong flow due to added coal bed methane water flowing into Little Thunder Reservoir. Historically this stream channel would have had a higher sediment load and flashier flow regime, but Little Thunder Reservoir and upstream ponds have retained sediment and moderated flows. This has led to more riparian vegetation and consistent flows than would occur in the absence of the reservoir.

The North Prong and Dry Forks of Little Thunder Creek has several small impoundments (including Stuart Reservoir) upstream of their confluence just below county road 52. These creeks also appear to be receiving coal bed methane flow which has led to increased flow year round in this watershed. As with the main stem of Little Thunder Creek, this stream channel has a decreased sediment load and more regulated flow than would have occurred naturally. Portions of this stream channel has been straightened and channelized near road and railroad crossings and through the mine area. Wetlands are located along portions of this branch of Little Thunder Creek.

### 3.4.2 Environmental Consequences

#### Alternative 1: No Action

Little Thunder Creek would continue to be impacted by the mining operations as the mine expands. The stream channels through the mining area would be reclaimed in approximately twenty years.

Direct and Indirect Effects: The no action alternative would have no direct or indirect effects on stream channels, riparian areas or wetlands as there would be no ground disturbing activities associated with this alternative.

Cumulative Effects:

The major cumulative effects are from the coal mining and coal bed methane activities. Little Thunder Creek and its tributaries upstream of the mine would continue to have increased streamflow from coal bed methane wells. Additionally, the many small impoundments in the upper watershed and Little Thunder Reservoir will continue to store sediment and decrease the amount of sediment transported in the stream channels below these structures. An assessment of the expected cumulative hydrologic effects was completed by the WYDEQ in 2007 for this area (Ogle and Calle, 2007).

During mining, streamflow through the mining area is routed through sediment detention ponds to meet water quality standards before the water is discharged to a stream channel downstream of the mining area.

Post mining, the stream channels are reshaped and the area is revegetated. Infiltration rates of the uplands will initially be lower due to the disturbed topsoil, which would result in higher runoff (Ogle and Calle, 2007). However slopes in reclaimed areas tend to be more gentle, which would tend to reduce runoff. Prior to bond release, WYDEQ requires that the reclaimed area is well enough vegetated that water does not need to pass through a sediment pond to meet water quality standards.

#### Alternative 2: Proposed Action

**Direct and Indirect Effects:**

Sediment

Sediment may increase in North Prong Creek due to stream channel widening caused by increased flow. This stream channel would widen as it would receive runoff from the watershed above Little Thunder Reservoir in addition to its own watershed, more than doubling its drainage area. Sediment would be deposited in the settling pond prior to being diverted back into Little Thunder Creek. Little Thunder Creek just below the settling pond would tend to erode due to loss of sediment supply, however since it is likely there would be yearlong flow in this section of creek, sedges and other aquatic vegetation would stabilize the stream channel.

### Stream Channel Stability / Condition

#### **Little Thunder Creek**

Little Thunder Creek below the reservoir would be dry except for short periods. The stream channel may erode due to loss of vegetation and a flashier flow regime. All but approximately 1.5 miles of creek (straight line distance) would be eventually be mined and so the stream channel would be eliminated and then reconstructed during reclamation. The 1.5 miles of creek remaining during and after mining would recover vegetation once the diversion is removed, expected to occur in 2023.

#### **North Prong Creek**

North Prong Creek would likely widen due to increased flows. It is also possible that the stream may flood more often due to the increased drainage area. This section of creek would receive increased flows and flows for longer periods, which would likely increase the vegetation in the stream channel. Most of this creek from the Hilight Road to the East Diversion would be mined through, so the stream channel would be eliminated and reconstructed when the area is reclaimed.

### Wetlands and Floodplains

#### **Little Thunder Creek**

Once the diversions are built, the only flow in Little Thunder Creek below the reservoir would be from localized precipitation falling on this portion of the creek, which would only occur sporadically during the year. Wetlands along this section of creek would diminish and vegetation would be replaced with the grasses and forbs found in the ephemeral stream channels in the area.

#### **North Prong Creek**

Much of this creek would receive more water yearlong as well, so wetlands along the un-channelized portions of the creek may expand, depending upon the flow regime. At the East Diversion, if some flow is retained in North Prong Creek, the wetlands in the stream channel downstream of the diversion would remain in a similar condition.

#### **Little Thunder Reservoir**

The reservoir would expand during high runoff times in the spring and during the summer rainy season. This is due to the 15' high diversion dam which would raise the reservoir high water level by approximately 8 feet (interpolated from the engineering drawings). During dry periods the reservoir level would likely lower to the existing level. This would result in a larger reservoir during wet periods, and during dry periods, the reservoir would be a similar size and depth as at present, but the vegetation around the reservoir may change, depending upon how long it is inundated.

#### **Cumulative Effects:**

#### Riparian Ecosystems

The riparian ecosystems around Little Thunder Reservoir would expand, and potentially the vegetation would change due to the change in reservoir levels. The riparian ecosystem on North Prong Creek between the diversions would also likely increase due

to increased flows. Both of these areas have seen an increase in riparian vegetation due to CBM water.

On Little Thunder Creek below the reservoir, the riparian ecosystem, increased in recent years from CBM water, would likely decrease in area and vigor due to decreased flows.

When the coal mining is completed in this area and the area is reclaimed, the watershed characteristics tend to be different than under undisturbed conditions with lower infiltration and higher runoff until vegetation and soil properties are restored.

### **Grassland Plan Consistency**

Alternative 1 (No Action) and Alternative 2 (Proposed Action) are consistent with the Grassland Water Standards listed above if the design criteria are adopted into the proposed action.

### **Consistency with other Laws and Regulations**

Consistency with Wetlands/Floodplains Executive Orders: If the wetlands are maintained along the sections of creeks not subject to future mining, and the wetlands, stream channels and floodplains are reclaimed post mining, this project will meet the intent of these executive orders.

Clean Water Act: Alternatives 1 and 2 would meet the Clean Water Act as all water discharged from the mine is required to meet State of Wyoming Water Quality Standards. All necessary permits should be obtained prior to project initiation. A stormwater discharge permit would be required, and a 404 permit, water right permit and turbidity permit may be required.

## **3.4 Paleontology**

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### **3.4.1 Affected Environment**

#### **Fossil Yield Potential Classification (FYPC)**

The Blocking Dike project location occurs within a geographic area designated FYPC 5. A FYPC 5 designation connotes fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant nonvertebrate (plant and invertebrate) fossils, and that are at risk of natural degradation and/or human-caused adverse impacts (Thunder Basin Grasslands Management Plan of 2002, Appendix J). A ground paleontological survey is required in FYPC 5 project areas before work begins.

The East Diversion project location occurs within a geographic area designated FYPC 3. A FYPC 3 designation connotes geologic units whose fossil content varies in significance, abundance, and predictable occurrence; also sedimentary units of unknown fossil potential (Thunder Basin Grasslands Management Plan of 2002, Appendix J). A ground paleontological survey is required in FYPC 3 project areas before work begins.

## Stratigraphy

The surface geology in the Blocking Dike project location has been mapped as the Wasatch Formation (Tertiary: Eocene). The surface geology in the East Diversion project location has been mapped as the Fort Union Formation (Tertiary: Paleocene), which directly underlies the Wasatch Formation in the Powder River Basin. Both formations formed in continental settings and comprise interbedded sandstones, siltstones, claystones, and coal beds.

The on-site surveys were conducted on July 15, 2008, by Michael Fracasso (Solid Minerals Project Manager) and Mike Sierz (Minerals & Lands Program Manager), accompanied by Bob Stowe and Lecia Kraft (both with Black Thunder Mine). The Blocking Dike project area comprised heavily vegetated, unconsolidated soils with no bedrock exposures. No fossils were located in this area. The East Diversion project area comprised predominantly vegetated, unconsolidated soils developed over infrequent, small areas of bedrock exposure. A number of stream-polished petrified wood fragments were present as surface “float;” however, no significant fossils or fossiliferous deposits were located.

### 3.4.2 Environmental Consequences

#### Alternative 1: No Action

There is no effect from the no action alternative, because there would not be any new ground disturbance.

#### Alternative 2: Proposed Action

There are no direct, indirect or cumulative effects to paleontological resources because there are no resources found in the area. Based on the survey, the probability of encountering fossil resources as a result of the project activities is low. If resources should be found during project construction the following mitigation will apply:

- The discovery of any and all fossils as the result of operations under this plan shall immediately be brought to the attention of the District Ranger. The permittee shall cease operations at the site of discovery until authorized to proceed by the District Ranger

## 3.5 Range

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### 3.5.1 Affected Environment

The two dikes are located in three allotments 275-Upper Basin Allotment, 256-Stuart Allotment and 274-Little Thunder Allotment. These allotments are currently permitted for approximately 615 Animal Unit Months.

The one of the grazing permittees expressed concern about impacts to livestock grazing along the Little Thunder Blocking Dike due to drifting of livestock into the structure.

### 3.5.2 Environmental Consequences

#### **Alternative 1: No Action**

There would be no impact to livestock grazing operations in the area because no changes would be made.

#### **Alternative 2: Proposed Action**

The construction of the diversions is not expected to impact forage available for grazing in the allotments because the total impacted area is small. The construction of the diversion structure could result in changes to livestock grazing and movement patterns in the allotment which could cause animals to move into the area around the reservoir or diversion and create a trap. This impact should be monitored and if it appears to be a problem, a fence could be built to reduce this impact. There are no expected cumulative effects from this project.

## 3.6 Social and Economics ---

### 3.6.1 Affected Environment

**Social:** Although individuals and communities over a wide geographic area use grassland resources, this report would concentrate its affect to the local area of Campbell, Converse, Crook, Niobrara and Weston Counties, Wyoming.

Historically, ranching has a long history in the local communities dating back to the 1800s. Many of the local ranching families are direct descendents of the area's earliest settlers while others have moved in recently (mostly with the energy boom). The use of the National Grasslands has been an integral part of the management of these ranches for years and contributes to the viability of their agricultural operations.

More recently, the energy increase in coal production, as well as oil and gas development has created a temporary work force. These workers are a temporary influence on the local social systems. They bring in different sets of values and lifestyles from all over the country. A good part of this workforce spends a lot of time recreational ATV riding on the TBNG (personal observation). The increase in ATV use and off road use is causing conflicts in values between the local ranchers (leaving gates open, chasing livestock, damaging trails and roads), hunters (chasing wildlife, damaging trails and roads), and non-motorized users (noise, pollution and damage to roads, trails and land from off-roading). Through personal interviews with the ranchers and hunters we found that they have a "love/hate" relationship with ATV's. They use ATV's, but they hate the results of abuse. These conflicts already existed, but have become intensified with increased use, especially increasing off-roading.

*Douglas:* The first residents of Douglas initially settled along the Platte River near the mouth of Antelope Creek. This settlement was generally referred to as the town of Antelope and soon became a center of commerce for area ranchers. After the townsite of Douglas was officially mapped and lots were put up for sale in September 1886, the town of Antelope was packed up and moved to present-day Douglas. Douglas was

incorporated in 1887, its population was down to 805; by 1907 the population was nearly 2000. In the beginning and for many years to come, Douglas was primarily an agricultural town. The general character of Douglas changed, however, with the development of the fossil fuel industry. Though still a relatively small town by American standards, it is no longer a town where ‘everybody knows everybody’. Douglas’ population was only 3,000 in 1970, and it now stands at about 5,700.

*Population trend-* Douglas population grew 4.2% from 1990 to 2000, Gillette’s population grew 20.4% from 2001 to 2006; Newcastle’s decreased 15% from 1980 to 2000; and Upton grew 33 % from 2000 to 2007. Other populations’ figures for these counties are compared below:

**Table 10: Population percent by county**

County by % of Population	By location Farm	By location rural	By location Urban	age 0-20 in	ages 21-44	ages 45 - 61 in	ages over 61	By gender Female	By gender Male
Campbell	1.9	36.64	61.46	26	38	29	7	48.63	51.36
Converse	5	51	43	32	32	21	13	50.15	49.84
Crook	11.5	88.5	0	23	28	31	18	49.4	50.6
Niobrara	16	84	0	19	30	29	22	51.2	48.8
Weston	3	52	45	19	28	36	17	49.23	50.76

\*2000 year figures from the Human Resources Module of the National Resource Information System (NRIS).

**Economic:** The final environmental impact statement (FEIS) for the Northern Great Plains Management Plans (includes Thunder Basin National Grassland Land and Resources Management Plan) presents data and analysis on the employment, income, economic diversity, and dependency and 25% Payment Funds for each county within a zone of influence. The zone of influence includes Campbell, Converse, Crook, Niobrara and Weston Counties in Wyoming. See the Economics section of Chapter 3 of the FEIS for a description of the employment composition and the affect or potential effect on each county due to management of the Thunder Basin National Grasslands. Economic uses of the project area include: livestock grazing, oil, gas, mineral leasing, recreation and tourism. These uses provide both employment and income to local community. Some economic factors of these counties are compared below:

**Table 11: Economic figures for these counties**

*County	% Unemployment	Median Family income	Median Home Value	Payment in lieu of taxes (federal government pays counties)
Campbell	2.9*	\$53,927	\$102,900	\$366,002*
Converse	4.2	\$45,905	\$84,900	\$356,983*
Crook	3.8*	\$43,105	\$85,400	\$87,352*
Niobrara	3.3*	\$33,714	\$60,300	\$148,112*
Weston	4.3*	\$40,472	\$66,700	\$221,308*

\* Data is 2001 from the NRIS

**Table 12: Employment type by county of the largest industries**

*County	Mining	Government	Other
Campbell	41.7	11.6	12.7 Services
Converse	20.3	17.9	22.6 Transportation and public utilities
Crook	12.4	22.4	13.5 Transportation and public utilities
Niobrara	NA	29.5	13.8 Transportation and public utilities. Services 11.0.
Weston	21.4	15.7	14.8 Services

\* Data is 2000 from the NRIS.

#### ***Legal and administrative framework***

**Social:** NEPA requires the integrated use of natural and social sciences in all planning and decision making that affect the human environment. The human environment includes the natural and physical environment and the relationship to that environment (40 CFR 1508.14). Forest Service land planning requires the integration of social science knowledge into the forest and regional planning process (36 CFR 219.5).

**Economics:** Economic analysis is required and/or supported by several acts (per FSM 1970.1). The Multiple Use Sustained-Yield Act of 1960 has direction to manage resources for the greatest good over time necessitating the use of economic and social analysis in determining management of the National Forest System. The National Environmental Policy Act of 1969 requires identification and analysis of economic and social impacts of proposed agency actions. Title 36 Code of Federal Regulations, Part 219, provides guidelines for evaluating alternatives in Land and Resource Management Plans and requires consideration of economic and social factors. FSM R2 supplement states conduct an economic benefit-cost and a financial revenue-cost analysis on all resource projects for which an: EA or EIS is prepared. Quicksilver is used to analyze both.

#### ***Effects on Economic and Financial Efficiency***

The main criterion used in assessing economic efficiency is Present Net Value (PNV), which is defined as the value of discounted benefits minus discounted costs. An economic analysis includes all outputs and costs, including timber, grazing and recreation for which monetary values are available. The monetary values include both market and non-market values, where available. A financial efficiency analysis was also completed to determine the financial returns (revenues) of each alternative. A financial efficiency analysis is the PNV of agency revenues and costs.

To calculate PNV, a software program named Quick Silver was used. This is a PC window based program and serves as a tool to evaluate management investments. Analyses are based on project alternatives that describe costs, revenues and scheduling of management activities.

There is a Forest Service cost associated with this project (proposed action). For all alternatives the economic efficiency (benefit-cost) analysis is the same as the financial efficiency (revenue-cost) analysis. The Quick silver program includes both analyses, which are required for an EIS or EA by Forest Service Manual (FSM 1970.61, R2 supplement).

The economic and financial efficiency analysis table below displays the PNV for each alternative. All monetary values are expressed in constant dollars with no allowance for inflation. A 4% discount rate was used. The reduction of PNV in any alternative as compared to the most efficient solution is the economic trade off, or opportunity cost of achieving that alternative.

<b>Table 13: Economic and financial efficiency analysis-Federal costs</b>		
	<b>Alternative 1</b>	<b>Alternative 2</b>
<b>Present Net Value</b>	<b>\$0.00</b>	<b>-\$5,389</b>

**Table 13** indicates that Alternative 1 is more economically efficient; however, most environmental benefits can not be quantified (see below).

When evaluating trade-offs, the use of economic efficiency measures is one tool used by the decision maker in making the decision. Many things cannot be quantified, like effects on wildlife, water quality, forest health, etc. The deciding official takes these and many other factors into account in making the decision.

### 3.6.2 Environmental Consequences

#### **Alternative 1: No Action**

There could be some impact to social and economic systems in the area if the diversion structure is not built because it would not be feasible to provide for safe conditions for mining in the area.

#### **Alternative 2: Proposed Action**

Mining would continue as planned in the area, maintaining jobs for the local economy. There would be no cumulative impacts in implementing the project.

## 3.7 Wildlife

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### 3.7.1 Threatened, Endangered, and Proposed Species Considered for Analysis

In December 2006, the Douglas Ranger District of the USFS provided Jones & Stokes (J&S) with a comprehensive list of TEPS wildlife species that may occur on the Thunder Basin National Grassland (TBNG).

The following list includes threatened, endangered, and proposed species, or their habitats, that are located on the Thunder Basin Nation Grassland of the Douglas Ranger District, or located adjacent to, or downstream of the project and could potentially be affected. A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and determine whether field reconnaissance is needed to complete the analysis. Sources of local and regional information included: USFS district wildlife GIS data (July 2005), data provided

by Bill Munro, (Wildlife Biologist with the Douglas Ranger District), Wyoming Game and Fish Department (WGFD) wildlife occurrence records (Cerovski et al. 2004), Bureau of Land Management (BLM), Buffalo Field Office wildlife data, wildlife data collected at this and other nearby coal mines (currently on file with USFS and LQD) current scientific literature, and other available reports pertaining to the biology of those species.

Candidate species have sufficient information on their biological status and threats to warrant a proposal to list as Endangered or Threatened, but development of a listing regulation is precluded by other higher priority listing activities. Species that are candidates for listing under the ESA are automatically placed on the Region 2 Forester's sensitive species list. The analysis and determination of effects for candidate species are included as part of the biological evaluation for sensitive species.

Two federally listed species has the potential to occur within Campbell County: the black-footed ferret (*Mustela nigripes*) and the Ute ladies' tresses orchid (*Spiranthes diluvialis*). Neither of these species is analyzed further in this report. The black-footed ferret relies exclusively on prairie dog colonies for food and shelter (Clark and Stromberg 1987). The Project Area encompasses approximately 380 acres of black tailed prairie dog colonies (*Cynomys ludovicianus*) currently suspected of being impacted by sylvatic plague, and black-footed ferret historical range. However, no impacts to the black-footed ferret will occur, as no ferret populations are known to exist within the Project Area, northeastern Wyoming, or the TBNG. Recently the USFWS declared all black-tailed prairie dog colonies within Wyoming as block cleared of black-footed ferrets (USFWS 2004). Additionally, the proposed activities are located outside the area identified for potential ferret reintroductions on the TBNG and consequently will not impact those plans (refer to Management Area 3.63, USFS 2002). The Ute ladies' tresses orchid is addressed in a separate botany report prepared for the USFS.

As of August 8, 2007, the bald eagle (*Haliaeetus leucocephalus*) was removed from the Endangered Species List. Bald eagles however, remain protected under the Bald and Golden Eagle Protection Act (16 U.S.C 668-668c). Forest Service Manual Policy (R2 Supplement, FSM 2672-11(6)) automatically places a species that has been delisted on the Regional Sensitive Species List. The analysis and determination of effects for bald eagles are therefore included as part of the biological evaluation for sensitive species in Chapter 3 of the BABE document.

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No further analysis is needed for species that are not known or suspected to occur in the Project Area, and for which no suitable habitat is present. The following table documents the rationale for excluding species.

**Table 14: Occurrence and availability of suitable habitat for federally Endangered, Threatened, Proposed, or Candidate vertebrate species within the Project Area.**

Evaluated species	Known or suspected to be present <sup>1</sup>	Suitable habitat present	Designated critical habitat present or could be affected	Rationale if not carried forward for analysis
Black-footed ferret <sup>E</sup> <i>Mustela nigripes</i>	No, Historical occurrence only	Yes	No	No known populations within the Project Area. Project related disturbances would not affect potential re-introduction habitat. Project is outside areas identified for potential ferret reintroductions on the TBNG.

<sup>1</sup> Based on 2005 & 2006 general field surveys of the Survey Area and surrounding area (Refer to Appendix C), data from baselines and annual wildlife monitoring at local coal mines (currently on file with USFS and LQD), and Cerovski et al. 2004.

<sup>E</sup> Classified as "Endangered" under the U.S. Endangered Species Act of 1973.

### 3.7.2 U.S. Forest Service Sensitive Species Considered in the Analysis

The USFS has developed a list of sensitive mammals, birds, amphibians, reptiles, fishes, insects, mollusks, and plants for USFS Region 2 (Forest Service Manual 2672.11 R2 FSM Supplement No. 2600-2003-1, Exhibit 01). That list is provided in Appendix D of the BABE document, and also includes the bald eagle which has since been delisted. The list was reviewed and all wildlife species known or expected to occur on the TBNG were given full consideration within the analysis. Sensitive plant species were evaluated in a separate report prepared for the USFS.

A pre-field review was conducted of available information to assemble occurrence records, describe habitat need and ecological requirements, and determine whether a field reconnaissance is needed to complete the analysis. Sources of local and regional information included: USFS district wildlife GIS data (July 2005), data provided by Bill Munro, (Wildlife Biologist with the Douglas Ranger District), Wyoming Game and Fish Department (WGFD) wildlife occurrence records (Cerovski et al. 2004), Bureau of Land Management (BLM), Buffalo Field Office wildlife data, wildlife data collected at this and other nearby coal mines (currently on file with USFS and LQD), current scientific literature, and other available reports pertaining to the biology of those species.

USFS Region 2 Sensitive Species (faunal only) or their habitats that are known or suspected to occur either on, near, or downstream of the Project Area are listed in Table 15. If a species was known to occur within the Project Area, or suitable but unoccupied habitat was present, then potential effects were evaluated. If suitable habitat was not present in the area, further analysis was not conducted. The presence of suitable habitat and justification for excluding sensitive species from further analysis are detailed in Table 15. Species requiring deciduous riparian sites with dense understories (the yellow-billed cuckoo), forested or forest edge habitats (the northern Goshawk, purple martin, Lewis's woodpecker, or flammulated owl), clearings in burned or logged forests (the olive-sided flycatcher), or rocky cliffs (the peregrine falcon, and spotted bat) were not evaluated further as those habitats are lacking within the Project Area. Fish species not

known to occur within the Cheyenne River basin (the finescale dace) or the upper tributaries of this basin (the mountain sucker), in which the project area is located, were eliminated from the analysis. The flathead chub was not considered as it requires large turbid rivers, which are not present within or directly downstream of the Project Area. Twenty-one species were identified that could potentially be affected by implementation of the Proposed Action.

**Table 15: Local occurrence, habitat availability, and rationale for exclusion from analysis for USFS Region 2 Sensitive Species (faunal) that are known or suspected to occur within the vicinity of the Project Area.**

Common name	Scientific name	Occurrence in TBNG	Suitable habitat in Project Area	Rationale if not carried forward for analysis
Finescale dace	<i>Phoxinus neogaeus</i>	Suspected	No	Does not occur within the Cheyenne River Basin
Plains minnow	<i>Hybognathus placitus</i>	No	Very little	Evaluated
Flathead chub	<i>Platygobio gracilis</i>	No	No	Field visits confirmed no suitable habitat is present†
Mountain sucker	<i>Catostomus platyrhynchus</i>	Suspected	No	Does not occur within upper regions of the Cheyenne River Basin
Northern leopard frog	<i>Rana pipiens</i>	Documented	Limited	Evaluated
Townsend's big-eared bat	<i>Plecotus townsendii</i>	Documented	Very limited	Evaluated
Fringed myotis bat	<i>Myotis thysanodes</i>	Documented	Very limited	Evaluated
Spotted bat	<i>Euderma maculatum</i>	Documented	No	Field visits confirmed no suitable habitat is present†
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	Documented	Moderate	Evaluated
Swift fox	<i>Vulpes velox</i>	Documented	Moderate	Evaluated
Bald eagle	<i>Haliaeetus leucocephalus</i>	Documented	Llimited	Evaluated
American bittern	<i>Botaurus lentiginosus</i>	Documented	Limited	Evaluated
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Documented	No	Field visits confirmed no suitable habitat is present†
Long-billed curlew	<i>Numenius americanus</i>	Documented	Limited	Evaluated
Olive-sided flycatcher	<i>Contopus cooperi</i>	Documented	No	Field visits confirmed no suitable habitat is present†
Flammulated owl	<i>Otus flammeolus</i>	Suspected	No	Field visits confirmed no suitable habitat is present†
Ferruginous hawk	<i>Buteo regalis</i>	Documented	Abundant	Evaluated
Northern goshawk	<i>Accipiter gentilis</i>	Documented	No	Field visits confirmed no suitable habitat is present†

Common name	Scientific name	Occurrence in TBNG	Suitable habitat in Project Area	Rationale if not carried forward for analysis
Northern harrier	<i>Circus cyaneus</i>	Documented	Limited	Evaluated
Burrowing owl	<i>Athene cunicularia</i>	Documented	Moderate	Evaluated
Short-eared owl	<i>Asio flammeus</i>	Documented	Moderate	Evaluated
Chestnut-collared longspur	<i>Calcarius ornatus</i>	Documented	Limited	Evaluated
McCown's longspur	<i>Calcarius mccownii</i>	Documented	Limited	Evaluated
Purple Martin	<i>Progne subis</i>	Documented	No	Field visits confirmed no suitable habitat is present†
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Documented	Moderate	Evaluated (see also Management Indicator Species section).
Mountain plover	<i>Charadrius montanus</i>	Documented	Moderate	Evaluated
Loggerhead shrike	<i>Lanius ludovicianus</i>	Documented	Moderate	Evaluated
Brewer's sparrow	<i>Spizella breweri</i>	Documented	Abundant	Evaluated
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Documented	Limited	Evaluated
Sage sparrow	<i>Amphispiza bellii</i>	Documented	Very limited	Does not regularly occur in general area.
Black tern	<i>Chlidonias niger</i>	Documented	Limited	Evaluated
Lewis' Woodpecker	<i>Melanerpes lewis</i>	Documented	No	Field visits confirmed no suitable habitat is present†

† General field studies conducted in vicinity since 1983; project-related surveys conducted in 2005 and 2006.

### Analysis of effects – Region 2 Sensitive species

Brief discussions of the status, distribution, and local occurrence of each species and the potential direct and indirect effects are presented in the BABE in the project record.

Cumulative effects are discussed for all evaluated Region 2 Sensitive Species at the end of this section. Determinations of effect are included within each species subsection in the BABE and summarized in Table 16.

**Table 16: Determinations of effect and their primary justification for U.S. Forest Service Region 2 Sensitive Species within the Project Area.**

Evaluated species	Effects Determination	Justification
Plains minnow	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	No documentation of species within Project Area. Little suitable habitat present. Some alteration of natural stream hydrological regimes.
Northern leopard frog	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Limited occurrence within area. Disturbance of available habitat. Limited potential for crushing by vehicles and equipment.
Townsend's big-eared bat	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	No documentation of species within Project Area. Little suitable habitat. Disturbance and removal of potential foraging habitat.
Fringed myotis	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	No documentation of species within Project Area. Little suitable habitat. Disturbance and removal of potential foraging habitat.
Black-tailed prairie dog	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Potential of mortality or injury from project related vehicles and equipment. Disturbance and removal of foraging habitat. Availability of alternate habitat in vicinity.
Swift fox	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Disturbance, removal, and fragmentation of potential den sites and foraging habitats. Limited increased risk of vehicle collisions. Availability of alternate habitat in vicinity.
Bald eagle	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Winter use of area by small groups of individuals. No recent nesting or winter roosts identified within one mile. Possibility of electrocution. Disturbance and fragmentation, and alteration of foraging habitats. Increased human activity.
American bittern	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	No documentation of species within Project Area. Disturbance and fragmentation of potential nesting and foraging habitats. Increased human activity.
Long-billed curlew	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Limited occurrence within vicinity. Disturbance and fragmentation of potential nesting and foraging habitats. Increased human activity.
Ferruginous hawk	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Disturbance and fragmentation of nesting and foraging habitats. Alternate habitat available in vicinity. Mitigation measures in place. Increased human activity.
Northern harrier	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Disturbance and fragmentation of potential nesting and foraging habitats. Availability of alternate habitat in vicinity. Increased human activity.
Burrowing owl	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Potential for occurrence within Project Area. Disturbance and fragmentation of potential nesting and foraging habitats, availability of alternate habitat in vicinity. Limited increased risk of vehicle collisions.
Short-eared owl	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Disturbance and fragmentation of potential nesting and foraging habitats. Availability of alternate habitat in vicinity. Limited increased risk of vehicle collisions.
Chestnut-collared longspur	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Present within the vicinity. Disturbance and fragmentation of potential nesting and foraging habitats. Availability of alternate habitat in vicinity. Limited increased risk of vehicle collisions.

Table 16 Continued

Evaluated species	Effects Determination	Justification
McCown's longspur	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Present within the vicinity. Disturbance and fragmentation of potential nesting and foraging habitats. Availability of alternate habitat in vicinity. Limited increased risk of vehicle collisions.
Greater sage-grouse	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Disturbance and fragmentation of potential but largely unoccupied year-round habitat. Few sightings in the general area. Availability of suitable habitat in vicinity.
Mountain Plover	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Limited occurrence. Disturbance and fragmentation of potential but unoccupied nesting and foraging habitats. Availability of alternate habitat in vicinity. Increased human activity.
Loggerhead shrike	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Present within vicinity. Disturbance and fragmentation of nesting and foraging habitats. Availability of alternate habitats in vicinity. Limited increased risk of vehicle collisions.
Brewer's sparrow	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Present within Project Area. Disturbance and fragmentation of nesting and foraging habitats. Increased human activity. Availability of alternate habitats in vicinity
Grasshopper sparrow	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Present within Project Area. Removal of good quality habitat. Availability of alternate habitat in vicinity. Creation of good quality habitat through reclamation. Increase human activity.
Black tern	May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.	Limited potential for occurrence. Disturbance, removal, and augmentation of resting and foraging habitats. Increased human activity.

### Cumulative effects

Cumulative effects are defined under the NEPA process as the incremental impacts of past, present, and reasonably foreseeable future actions conducted by any entity (federal, state, private, and others).

Cumulative short- and long-term disturbances to the species considered in this analysis arise from multiple sources. Those occur on Federal and non-federal lands and include direct and indirect impacts of mining within the Project Area (with an anticipated life of at least 20 years), extraction of conventional oil and gas and CBNG reserves, road and rail line development or relocation, grazing (livestock and wildlife), drought, occupied residences, hunting and trapping, and other forms of dispersed recreation. Those activities have occurred in the vicinity of the Project Area in the past and most are expected to continue at similar levels. Coal mining and CBNG development are expected to occur at an increased rate in the future. Other reasonable foreseeable developments within the area would include the construction of a coal-fired power plant and new rail lines for transporting coal. Both mining and oil and gas development activities have requirements for reclamation of disturbed areas as resources are depleted. As new areas of disturbance related to these two activities are added, mined-out areas are restored and reclaimed and oil and gas well sites are reclaimed when depleted wells are abandoned.

The cumulative impacts to sensitive species in this document are analyzed according to their main habitat association.

### **Sagebrush Obligates**

Species associated with sagebrush habitats that could occur in or near the Project Area include the greater sage-grouse and Brewer's sparrow. Cumulative impacts to sagebrush habitats and these associated species will largely result from the fragmentation, alteration, degradation, and conversion of sagebrush stands from the continuation and expansion of mining activities, in combination with the other activities discussed above. Mine-related impacts in sagebrush habitats would be mitigated as required, although would not likely be able to fully mitigate the on-going loss or alteration of sagebrush habitat within the area as sage stands may not become fully reestablished until two to three decades after seeding. Other adverse impacts to the Brewer's sparrow and sage-grouse would potentially include loss of nests or individuals and the potential displacement of individuals from seasonal or year-round habitats. These species may experience increased rates of predation due to the creation of favorable habitats or travel corridors for mammalian predators, resulting from fragmentation of sagebrush habitats. Some individuals could be killed or injured by vehicles or shooting (specifically sage-grouse). Nests may be destroyed or otherwise compromised by activities (i.e., construction, off-road driving, livestock grazing) conducted during the breeding season. Any displaced individuals would have to compete for available adjacent territories, and if adjacent habitats are at carrying capacity, intraspecific competition may result in nutritional stress, decrease in fecundity, or mortality to affected individuals. Cumulative effects of ongoing activities may have already resulted in the loss or displacement of sage-grouse from the area.

### **Mixed Sagebrush and/or Mid-grass Species**

Mid-grass parcels interspersed with sage are also common in the Project Area, and will be impacted. Evaluated species for mixed sagebrush and grassland habitats included the swift fox, long-billed curlew, ferruginous hawk, northern harrier, short-eared owl, and grasshopper sparrow. The cumulative impacts would be the similar to those described above. However, as all of these species have the capacity of utilizing a variety of habitats, the cumulative effects would be lessened somewhat. With respect to the swift fox, the fragmentation, alteration, or destruction of suitable habitats would also destroy denning and shelter sites and potentially facilitate interspecific competition for available prey species. Both the swift fox and the raptor species utilizing these habitats would also be negatively affected by activities that could reduce prey availability. The greatest threat to mixed sagebrush and/or mid-grass species would arise from the creation of habitat patches that are too small to sustain or attract individuals.

### **Species Utilizing Mixed Sagebrush and Grasslands with Trees**

Species associated with mixed sagebrush grasslands, or grasslands and that utilize forested areas that could occur in or near the Project Area include the bald eagle, Townsend's big-eared bat and loggerhead shrike. Cumulative effects to bald eagles would be similar to those for raptors associated with mixed sagebrush and mixed grassland habitats, with the exception that this species does not nest within the vicinity and would frequent the area during the winter or migration period. Habitat loss,

fragmentation, or degradation of foraging habitats, potential roosting habitats, and the displacement of foraging areas due to human and equipment disturbances would likely also occur. However, due to the seasonality of use of the area and availability of sufficient food sources within the surrounding areas, cumulative impacts from the proposed project are not expected to negatively impact bald eagle populations in the Powder River Basin. Cumulative effects to shrikes would be similar to those for non-raptor avian species within mixed sagebrush mid grass habitats. As it is doubtful that the Townsend's big-eared bat frequents the Project Area, cumulative impacts are expected to be minimal for this species and would result solely from the destruction, disturbance and alteration of small areas of unoccupied foraging habitat.

### **Species Associated Primarily With Short Grasses or Prairie Dog Colonies**

Five evaluated species are strongly associated with prairie dog colonies or other areas with short, sparse vegetation: the black-tailed prairie dog, mountain plover, burrowing owl, McCown's longspur and chestnut-collared longspur. Cumulative impacts to these habitats and associated species will largely result from the removal and alteration of these habitats, and activities that would decrease the population and extent of black tailed prairie dogs within the area. As burrowing owls rely heavily on black-tailed prairie dogs to provide nesting burrows any activities that jeopardize prairie dogs will equally affect burrowing owls. As McCown's and chestnut collared longspurs can utilize other habitats, the extent of cumulative effects to these species are somewhat lessened. Regardless, cumulative effects expected for these species would include habitat destruction, alteration, and fragmentation. Some individuals will be killed or injured by vehicles or equipment, collisions with fences, and poisoning or shooting. Individuals may experience increased rates of predation due to the creation of favorable habitats, structures, or travel corridors for avian or mammalian predators. Nests of avian species will likely be destroyed or compromised by human disturbances or activities, and individuals (especially avian species) will likely displaced from existing territories. Any displaced individuals would have to compete for available adjacent territories, and if adjacent habitats are at carrying capacity, intraspecific competition may result in nutritional stress, decrease in fecundity, or mortality to affected individuals.

### **Riparian or Wetland/Aquatic Species**

Species associated with riparian or aquatic habitats that could occur in or near the Project Area include the plains minnow, northern leopard frog, fringed myotis, American bittern, and the black tern. As the northern leopard frog is the most likely species to regularly occur within the area, it therefore has the most potential to be affected by the cumulative impacts. Specifically, individuals could be killed or injured by activities in proximity to aquatic habitats. Dewatering or degradation of breeding habitats could kill eggs, tadpoles, or overwintering adults, as well as increase predation rates on adults. Conversely the creation and augmentation of aquatic habitats could maintain and increase local northern leopard frog populations. As it is unlikely that the fringed myotis, plains minnow, or American bittern occur within the Project Area, cumulative impacts are

expected to be minimal for these species and would result solely from the destruction, disturbance, and alteration (including augmentation) of small areas of unoccupied breeding (plains minnow only), nesting (American bittern only) and foraging habitat.

Overall, despite the possible death, injury, and displacement of some animals, the cumulative impacts associated with the Proposed Action are not expected to significantly reduce the size or viability of populations of any of the USFS Region 2 Sensitive Species. Many of these species have either not been documented within the Project Area or Analysis Area over the years, have already been displaced from the Project Area and vicinity, or have remained present despite the ongoing mine and non-mine activities in and near those areas. In addition, the Proposed Action would not conflict with the current Grassland Plan (USFS 2002) or future objectives to manage the area for Region 2 Sensitive Species.

- To help protect R2 Sensitive Species USFS may ask that the operator notify the District Ranger, Douglas Ranger District, if a sensitive species nest, winter roost, or den in addition to any identified in this Biological Evaluation is located during construction or operation of the project.

### **3.7.3 Management Indicator Species Evaluated**

A Management Indicator Species (MIS) is defined as a “plant or animal species or habitat components selected in a planning process used to monitor the effects of planned management activities on populations of wildlife and fish, including those that are social or economically important” (USFS 2002). Management indicator species (MIS) are selected to serve as barometers for species diversity and viability. Management indicator species are monitored over time to assess the effects of management activities on their populations and habitat, and the populations of other species with similar habitat needs. MIS for TBNG are identified by Geographic Area. In accordance with the Grassland Plan (USFS 2002), the greater sage-grouse was selected as the management indicator species to be evaluated for this project (as defined for the Hilight Bill Geographic area).

The sage-grouse is selected as a management indicator species for sagebrush habitats that have tall, dense, and diverse herbaceous understories (USFS 2002). Sage-grouse generally do not respond positively to human activities and disturbances. The decline in sage-grouse across its range has been attributed, in part, to a loss in habitat or its function, and increased human disturbances during critical periods of its life cycle. These periods include breeding, nesting, and in some cases during stressful periods due to winter conditions (USFS 2002).

#### **Life History and Habitat Requirements**

The greater sage-grouse occurs year-round throughout non-forested regions of Wyoming (Cerovski et al. 2004). Sage-grouse are largely sagebrush obligates and rely on a variety of habitats within sagebrush dominated landscapes to reproduce and survive throughout the year. Early in the spring, grouse gather at breeding display sites called leks. Leks are typically within open areas (playas, ridge tops, sparse sagebrush, or burned areas) with low vegetation, often near denser sagebrush stands that can also provide foraging,

roosting, loafing, and nesting habitat, in addition to escape cover. Once formed, grouse (both male and female) tend to return to these leks habitually each year. Males will remain in attendance at the lek until all females have left the area.

After being bred, hens typically scratch out a nest under sagebrush (Connelly et al. 1991) within 1.9 miles of the lek (Schroeder et al. 1999). Nesting habitat in Wyoming is described as sagebrush stands with a canopy cover of 6% - 40%, with higher quality nesting habitat being associated with the end of that range. Within the Southern Powder River Basin, sage-grouse were observed nesting within stands ranging from 16% - 28% canopy cover (Brown and Clayton 2004). Findings of that study suggested that when herbaceous cover was diminished due to drought conditions, grouse tended to nest within denser and taller sagebrush stands than in years with good herbaceous cover, when hens nested in more open and shorter sagebrush stands. Nests are typically placed under sagebrush with average height of 15-33 inches. (Schroeder et al. 1999), however research conducted within the Southern Powder River Basin (Brown and Clayton 2004) indicated that although shorter sagebrush was available at nest sites, grouse selected shrubs ranging from 23-25 inches in height under which to place nests. Despite the observed variations from various studies, nest success is typically enhanced where both sagebrush and residual grass cover are taller and denser (Gregg et al. 1994). Re-nesting may occur if the nest is destroyed early during the laying or incubation period. Sage-grouse exhibit high fidelity to seasonal ranges, and may return to the same area to nest in subsequent years. For the first month after hatching, the young depend on more open sagebrush stands with an abundance of forbs and insects, especially ants and beetles (Drut et al. 1994, Schroeder et al. 1999). Late-season brood rearing habitats, such as wet meadows and bottomlands, are more mesic and support greater forb cover (Drut et al. 1994). Sage-grouse use a variety of habitats during fall, and the incidence of sagebrush in their diet increases as forbs become less available. During winter, grouse feed upon sagebrush leaves almost exclusively. Winter range is characterized by large expanses of dense sagebrush. Where snow accumulations are significant, gentle south- and west-facing slopes, or windblown ridges are preferred. Characteristics of sagebrush stands for nesting and wintering are very similar, but in winter, at least 12 inches of the sagebrush plant needs to remain above the snow.

Most adverse impacts to sage-grouse populations can be related directly or indirectly to habitat conditions (Schroeder et al. 1999). Nest success and survival of adult hens are usually cited as the most significant parameters influencing sage-grouse population dynamics, and can be influenced by residual grass height, weather, habitat fragmentation or degradation, and predation. Pesticides and herbicides may reduce insect and forb availability, and both can have significant impact on nesting females and chicks during breeding season (Schroeder et al. 1999). The exact effect of human disturbances on nesting grouse is unclear, however, data suggests that most nest abandonments are related to human activity, and the likelihood of abandonment is higher when nests are disturbed early in incubation period (Schroeder et al. 1999). Human activity such as resource extraction, livestock grazing, and military operations, may adversely influence display activity when disturbances are near breeding areas. With respect to resource extraction

and military operations, it is speculated that the increased noise level may be a primary factor interfering with display activities.

### **Available Habitat**

#### **Project Area/Analysis Area**

The dominant vegetation community within the sage-grouse analysis area (Project Area and surrounding two-mile buffer) is big sagebrush shrubland, which occurs in approximately 52% of the area. Active mine lands (including but not limited to open pits, reclaimed areas, facilities, roads, overburden and topsoil piles) comprise 24% of the overall area. Native and introduced grassland habitats, including prairie dog colonies, cover approximately 18%, and 5% of the analysis area are classified as disturbed (e.g., county roads, two tracks roads, rail lines, oil and gas wells and facilities). The remaining lands (1%) are comprised of various upland (e.g., pine breaks) and bottomland (e.g., cottonwood-riparian) communities, and open water. Sagebrush shrublands were most prevalent and contiguous in the western portion of the analysis area. Here they occurred in dense to moderately dense stands, and plants ranged in height from 7-22 inches. In the remaining portion of the analysis area, sagebrush was present at lower densities, as a mosaic of sparse to moderately dense stands, typically less than 14 inches in height intermixed with dry grasslands. The eastern and southern portions of the area were primarily sparse to medium, dry herbaceous rangelands (grasslands).

The range of sagebrush density and height within the sage-grouse analysis area represents potential year-round habitat for sage-grouse. In addition to Little Thunder Creek and existing naturally mesic drainages, other ephemeral drainages currently receiving discharge water from existing CBNG development could provide adequate brood rearing habitat. Depending on the snow depth during any given winter, adequate wintering habitat is present within all sagebrush habitats within the analysis area.

The proposed project activities could potentially impact as much as 2,990 acres (4.7 mi<sup>2</sup>) of USFS lands in order to facilitate the removal of coal through at the BTM. Based on the known physical characteristics of the Project Area, it is estimated that approximately 82% of that area (2,392 acres) could provide potential breeding, nesting, brood-rearing, and/or winter foraging areas for sage-grouse. Forty-five (45) percent of the potential sage-grouse habitat (1345 acres) is comprised of sagebrush habitats; the remaining 37% percent consist of riparian corridors, ephemeral bottomlands, and black-tailed prairie dog colonies. Some of these habitats are directly adjacent to ongoing mining activities.

Existing corridors associated with oil and gas developments, low use two-track roads, all-weather roads, fencelines, and overhead H frame transmission lines currently fragment portions of the sage-grouse analysis area. In addition to the primary source of disturbance within the area (active coal mining), land uses in the vicinity include livestock grazing (both cattle and sheep), CBNG and conventional oil development, hunting and trapping, and limited recreation. Oil and gas development is most prevalent within the western portion of the area, while livestock grazing and prairie dog shooting are the primary disturbances occurring to the east of the Project Area.

## **Grassland-wide and Geographic Area**

The amount of potential sage-grouse habitat (sagebrush and grassland mixture) currently available to sage-grouse on TBNG is estimated at 438,000 acres. Over half of the Hilight Bill Geographic Area is considered potentially suitable sage-grouse habitat, and the USFS would consider much of the sagebrush stands within the sage-grouse analysis area as potentially suitable sage-grouse habitat. It is assumed that the percentages of both moderately dense and dense sagebrush stands found on the TBNG are relatively consistent with overall stand structure and conditions existing throughout the Powder River Basin.

## **Populations**

### **Project Area/Analysis Area**

Wyoming Game and Fish Department records (obtained from D. Thiele, Wildlife Biologist, WGFD, Buffalo, WY) revealed two sage-grouse leks (Black Thunder and Stuart II) within the surrounding two-mile buffer (Exhibit 1). No new leks have been observed within the analysis area since 1984. The Black Thunder lek (NE NW Section 31, T43N R70W) has been monitored annually since 1984, and was last attended by grouse in 1993. The highest number of males observed at this lek was 21 in 1984 (Table 4). Consequently, as this lek has not been used during the past five breeding seasons, the lek is considered as historic and all corresponding stipulations outlined in the Grassland Plan (USFS 2002) specific to this lek site are waived. The Stuart II lek (Section 8, T43N R71W), first discovered in 1979, is approximately 1.9 miles west of the Project Area. The maximum number of males observed on this lek was seven in 1991. Although WGFD records are incomplete (i.e., leks not checked every year), grouse have only been observed at the lek during two of the twelve years the site was surveyed. Grouse were last observed on the lek in 1991, and no grouse or sign has been observed at the lek during the past four consecutive years (2004-2007). Survey data suggests grouse have never regularly utilized this site, and the lek may be considered historic. All proposed project related surface disturbances are greater than two miles from this lek.

The closest confirmed active lek (Payne lek) is approximately 3.6 miles south of the Project Area in NE NW Section 26, T42N R70W. Radio telemetry data from a sage-grouse monitoring project conducted in 2001-2005, revealed that from 2001 through 2003, three individuals observed breeding at the Payne lek occasionally inhabited portions of the sage-grouse analysis area in 2002 and 2003 (Brown and Clayton 2004). Since 2003, lone sage-grouse or small flocks have occasionally been observed within the general area during wildlife surveys for BTM. Due to the absence of active sage-grouse leks and lack of consistent observations of grouse within the Project or Analysis Area it is unlikely that grouse regularly frequent these areas.

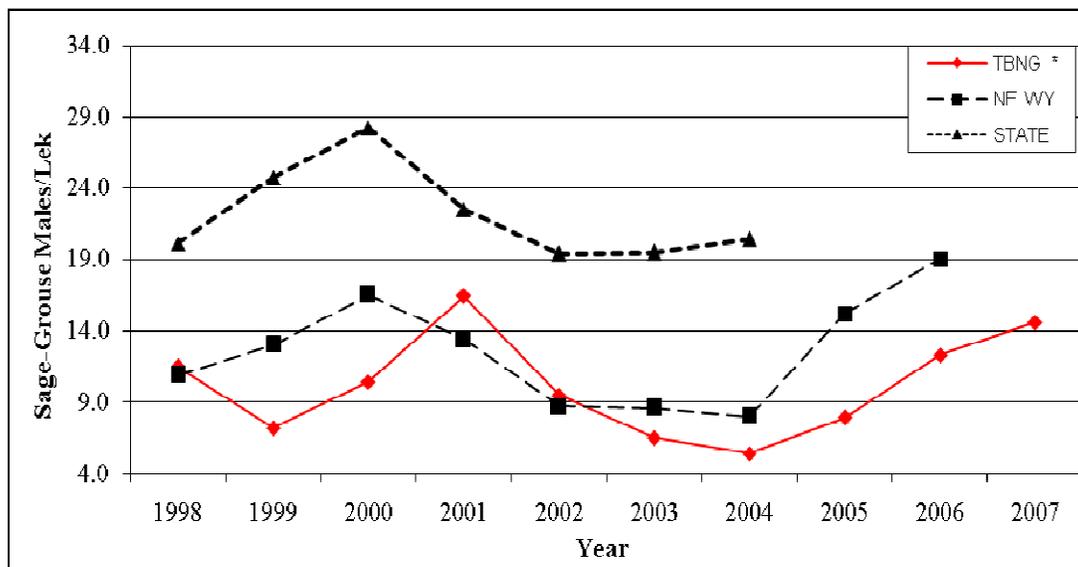
### **State-wide and Northeast Working Group Area**

From 1998 through 2004, the state-wide population has exhibited fluctuations, but shows no overall change for that period (Figure 1). This is based on average male attendance per lek, which is accepted as a good indicator of population trends. The number of males

per lek statewide peaked in 2000 with an average of approximately 28.2 males per lek. In 2001, and 2002, the numbers of males observed per lek decreased sharply, then increased slightly in subsequent years (Figure 1). This gradual increase in males per lek state-wide has occurred despite extended periods of drought in some areas of the state and the emergence of West Nile virus (WNV), which was documented in sage-grouse in northeast Wyoming in 2002 (Brown and Clayton 2004, Naugle et al. 2004b). State-wide population information for 2005 through 2007 is not available at this time and will be incorporated when available.

The Northeast Wyoming Working Group area encompasses all of the Thunder Basin National Grassland. Although the average numbers of males per lek have typically been lower than those observed state wide, the Northeast Working Group population exhibits a similar trend. Data from recent years indicates that populations within this area are increasing. The average numbers of males per lek (19.5) from counts in 2006 were notably higher than the 15.2 males per lek observed in 2005 and the highest numbers observed over the last nine years. The observed decline from 2000 through 2004 could have been influenced partially by the emergence of WNV, which was first documented in the Southern Powder River Basin of northeastern Wyoming in 2002 (Brown and Clayton 2004). Survival analysis using marked sage-grouse within the Powder River Basin indicated that the incidence of WNV can contribute to pronounced local population declines, but that grouse may be able to develop tolerance to the disease. Naugle et al. (2004b) suggests that male sage-grouse may be especially susceptible to high rates of mortality from WNV. The synergistic effects of other factors such as drought, increased development, and grazing may also have influenced the decline.

**Figure 2: Average male sage-grouse lek attendance statewide, within the Northeast Wyoming Local Sage-Grouse Working Group Area, and within the Thunder Basin National Grassland (1997-2007).**



\* Pertains to leks on USFS Administration lands only.

## Grassland-wide and Geographic Area

Sage-grouse population estimates specifically pertaining to the TBNG, were derived from count data obtained from all known sage-grouse leks within the TBNG or on adjacent lands if they are a part of the complex occurring on USDA Forest Service Administration Lands. Average male per lek attendance were calculated from count data from leks only on USFS lands. The 10-year sage-grouse population trend suggests an overall increase in individuals while the 10-year mean averages 1973 individuals (Figure 2). The estimated population increased from approximately 1537 birds in 1995 to an estimated 2775 individuals in 2007. During this period, the population exhibited the same general trend as the Northeast Working Group area and state-wide. Although fluctuations were observed, the estimated number of grouse on the TBNG increased from 1998 through 2001, peaking at an estimated 3243 individuals then decreased significantly in 2002 through 2004. The grouse population within the TBNG increased markedly between 2004 and 2006, and then at a slower rate in 2007 to the second highest estimate observed since 1998. It is important to remember that these numbers represent an estimated minimum population, not a total inventory or the complete population size.

Seven leks have been documented on USFS land in the Hilight Bill Geographic Area. Three are classified as abandoned or destroyed, and as of 2007, two leks are still considered active. Although the average number of males at leks has increased from 2004 through 2007, male attendance is just slightly above the ten-year mean of 4.3 males/lek.

The appearance of WNV within populations within the TBNG in 2002 has complicated sage-grouse population concerns in that region. As this disease is fairly new to the grouse within the TBNG, the potential impact of WNV within the TBNG sage-grouse population is unknown at this time. When the disease first appeared in the naïve population, research indicated mortality rates as high as 75% to 100% of infected birds. Ongoing research suggests that individuals can gain tolerance to the disease. In recent years impacts from WNV have been less pronounced. WNV impacts may be limited by low rates of exposure to the virus, tolerance, or a combination of both factors. Recent findings are suggesting that late summer survival for birds from populations with WNV are 10% lower than for birds from populations with no WNV (Naugle et al. 2005 in Thiele 2006). Studies are ongoing to evaluate this new impact and its contribution to cumulative effects on sage-grouse populations on the TBNG and throughout the region.

### 3.7.3.1 Alternative 1: Proposed Action

#### Direct and Indirect Effects

#### Direct and Indirect Effects on Habitat in Project Area

Over the life of the mine the proposed activities will likely impact all lands (2,990 acres) within the Project Area, of which approximately 45% or 1345 acres is sagebrush habitat. As sage-grouse are sagebrush obligates the loss of sagebrush can possibly reduce the

potential carrying capacity of the area for greater sage-grouse. However, as no confirmed active leks are present within at least three miles of the Project Area and grouse are infrequently observed within the area, the proposed activities will result in the loss of as much as 1345 acres of largely unoccupied or infrequently used year-round sage-grouse habitat. Before these lands are totally encompassed or altered, portions will be fragmented, disturbed, degraded, or altered by relatively short-term mine related disturbances (e.g., topsoil stripping and deposition, drilling, reservoir and diversion channel construction). These disturbances may encourage predators, and increase human disturbance in potential sage-grouse habitat, which may inhibit the use of such habitats by sage-grouse. The acreages of mining disturbance will vary both within and among years, and all mine-related habitat disturbances will shift throughout the Project Area as operations progress. The proposed project also has the potential to negatively impact greater sage-grouse habitat through the introduction of noxious weeds, such as cheatgrass. Cheatgrass not only chokes out native species but also has resulted in increased fire frequencies and consequently a reduction in sagebrush habitat in states such as Oregon, Washington, and Idaho.

Mining operations have requirements for reclamation of disturbed areas as recovery of energy resources is completed. Those reclamation efforts can work in concert with Standards and Guidelines toward mitigating impacts to wildlife habitats, although reclamation standards are widely variable among industries. New areas disturbed by mining in the general Project Area will be reclaimed incrementally, but may not be attractive to sage-grouse for many years due to slow establishment and growth rates of important sagebrush species.

### **Direct and Indirect Effects on Individuals in Project Area**

Although potential year-round habitat is present on and near the Project Area, existing wildlife data suggests that sage-grouse are not regularly present within the vicinity of the proposed activities. One known lek within two miles of the Project Area (Black Thunder) has been “abandoned,” since 1994, and the other lek (Stuart II) has likely been abandoned and is located beyond two miles of any foreseeable project related disturbances within the next five years. No new leks have been observed in the area, and the nearest confirmed active lek is greater than three miles away. Additionally, there have been few observations of sage-grouse within the Project Area during recent wildlife surveys conducted at the BTM. Therefore, the proposed development may only affect the few fringe individuals that may frequent portions of the Project Area.

For the few individuals that may reside or frequent the area, direct effects to any individuals present within Project Area would result from mortality or injury adults, nests, or nestlings, from collisions or encounters with mine vehicles or equipment. Indirect effects to sage-grouse within the Project Area would include an increase in predation due to fragmentation of habitat by mine related activities that could increase the efficiency of mammalian predators, and the creation or relocation of structures (e.g. fences and power poles) that could provide perch sites for hunting of raptors. Project activities in proximity to sage-grouse nests may cause nest abandonment, or avoidance of

the area. Linear habitat disturbances within sagebrush habitats will often create new foraging areas for sage-grouse as these areas attract insects and allow for the development of forbs. However, these disturbed areas also make grouse more susceptible to predation because of the creation of corridors. As very few sage-grouse are likely to inhabit the area, and have the ability to disperse away from negative activities within the Project Area to the greater surrounding area, project activities are unlikely to have any contributing affects on the viability of sage-grouse populations outside of the analysis area.

### **Cumulative Effects**

#### **Direct and Indirect Effects on Habitat Trends Grassland-wide**

Under the Proposed Action as much as 1345 acres of potential but largely unoccupied sage-grouse habitat would be affected. Therefore the project will contribute to the cumulative loss of sagebrush habitat within the Hilight Bill Geographic Area and the TBNG. Cumulative effects under NEPA include the incremental effects of past, present and reasonably foreseeable related future actions without regard to land ownership or federal approval. Many of the impacts to sage-grouse habitat within the analysis area (Project Area and one-mile buffer) are consistent with known and potential impacts occurring across many other areas of the TBNG. Activities associated with mining operations and other resource extraction industries have been ongoing across the much of the TBNG, although at a lower rate than that currently experienced within the analysis area. Surface coal mining is present within a localized area within the TBNG, while oil and gas leasing and development have been ongoing across much of the TBNG. The additional and synergistic impacts from, but not limited to, road and rail line development or relocation, grazing (livestock and wildlife), drought, occupied residences, hunting and trapping, off-road vehicle use, and other forms of dispersed recreation, construction of under ground utility lines, above ground power lines, and new fence development continue to adversely impact sage-grouse habitat and sagebrush stands. Natural resource development has requirements for reclamation of disturbed areas as resources are depleted. As new areas of disturbance related to these activities are added, disturbed sites are reclaimed when depleted areas are abandoned. These efforts would help mitigate future habitat losses, although the full benefits from reclaimed lands would not be realized for many years after the decommissioning phases of the projects.

While these impacts can, and have occurred in many places across the Grassland, several areas continue to provide suitable, occupied sage-grouse habitat. Those locales provide a stronghold of habitat distributed in many areas across the TBNG. If the Proposed Action is implemented, the existing sage-grouse habitat is expected to decline within the sage-grouse analysis area due to this and other proposed activities on and within the vicinity of the Project Area. Future expansion of BTM is expected to encroach upon sage-grouse habitats in the Project Area in the near future. The Hilight Bill Geographic Area (within which the BTM project is situated) represents only 17% of sage-grouse habitat within the TBNG, and harbors approximately 7% of the leks within the TBNG. Consequently, sage-grouse habitat across the region, while being reduced, currently still provides enough suitable, occupied habitat to maintain a well distributed population across the

TBNG. If widespread development continues, this condition may not persist over the long term. U.S. Forest Service Lands underlying the proposed development within the analysis area represent less than 0.2% of the entire TBNG. The effects of the Proposed Action on sage-grouse habitat represent an insignificant change in relation to the overall habitat available on TBNG. The effects to the potential but largely unoccupied sage-grouse habitat within the Project Area, while important, are not enough to ultimately determine sage-grouse population viability.

### **Direct and Indirect Effects on Population Trends Grassland-wide**

Recent population trends in the TBNG were discussed above in *Populations: Grassland-wide* and illustrated in Figure 2. In summary, the 10-year sage-grouse population trend within the TBNG suggests an overall increase in individuals.

Collectively, the impacts from developing the coal resource, in combination with numerous non-mine activities including gas extraction, on lands within the Project and Analysis Areas could diminish the survival and reproductive success of only a few individual sage-grouse. As it appears that very few individuals regularly inhabit the area, this project is expected to only marginally contribute to the reduction of sage-grouse numbers in proximity of the analysis area and within the Highlight Bill Geographic Region, or the TBNG. Therefore contributions to any cumulative effects or loss of viability or sage-grouse within these areas are negligible.

While it appears that the sage-grouse population within the Highlight Bill Geographic area (within which the BTM Project Area is located) is increasing it is still below the 10-year average. Other populations across the National Grassland are also currently increasing. Sage-grouse still occur in five of the six Geographic Areas, with the majority of the population residing outside the Highlight Bill Geographic Area.

It should be noted that the effects of any single action would not likely significantly affect sage-grouse, but combined with other actions, would result in negative synergistic effects to both habitats and populations. To complicate sage-grouse population concerns on TBNG, the presence of West Nile Virus (WNV) found in sage-grouse in 2002 has contributed to the effects from other impacts (Brown and Clayton 2004). How this disease will affect sage-grouse populations in the short- or long-term is unknown. This disease appears to initially cause high mortality rates (75% to 100% of infected birds) in naïve sage-grouse populations, however, recent studies suggest mortality rates from WNV may have dropped considerably in the same populations (Naugle et al. 2005 in Thiele 2006). Studies are ongoing to evaluate this impact. The maintenance of widely distributed sage-grouse populations might be important in the recovery of local flocks should WNV in combination with other factors cause local extirpations.

### **Summary of Effects on Grassland-wide Habitat and Population Trends as it Relates to Viability**

The presence of the historic Black Thunder lek, and the likely historic Stuart II lek within the sage-grouse analysis area indicates that sage-grouse were present within the area in

the past. As both leks have been inactive in recent years and possibly as long as 10 years, it is unlikely that sage-grouse are currently present in large numbers within the BTM area. Other nearby potential habitat is currently unoccupied (or rarely frequented) by sage-grouse, and those areas could serve as temporary refuges during active mining operations. However, those areas are currently experiencing increased development by the coal mining and CBNG industry along with other ongoing activities such as livestock grazing, and heavy human use (travel, hunting, trapping and dispersed recreation), and thus, may not provide adequate alternate habitat in the long-term. Efforts to restore disturbed lands to their original pre-mining land use, with similar vegetative condition, would mitigate the effects to some degree. Nevertheless, benefits from reclamation would not be realized for many years, and off-site habitat restoration/protection projects may be too far from the Project Area for dispersing sage-grouse to easily relocate to. Within the Hilight Bill Geographic Area, which encompasses the Project Area and sage-grouse analysis area, long-term downward trends of habitat availability and quality and a relatively low, fluctuating population have been observed. Implementation of the Proposed Action would only affect limited quantities of potential but unoccupied habitat. Precluding the proposed activities would prevent these disturbances, but would not likely create any refuge for grouse or positively contribute to the viability of sage-grouse or their habitats within the TBNG.

Data collected over the last 10 years indicates that the population within the Hilight Bill Geographic Area appears to fluctuating at a low but stable level. This Geographic Area represents approximately 7% of the population (active leks) for the TBNG. Despite the declines in numbers in this Geographic Area, about 93% of the Grassland-wide population persists elsewhere in the TBNG. Furthermore, the Grassland-wide long-term (10-year) trend in sage-grouse populations appears stable to increasing. Therefore, the Grassland-wide population appears to be maintaining its viability overall.

Sage-grouse occur in five of the six Geographic Areas, with the majority (93%) of the population (active leks) residing outside the Hilight Bill Geographic Area. Those populations appear to be maintaining adequate numbers at this time. If the population within this Geographic Area were to become extirpated, it would not constitute a loss of sage-grouse viability on the TBNG as a whole, as grouse would still occur within 83% of the Grasslands. However, the local population helps the USFS meet the Management Direction to maintain a well-distributed population throughout the Grasslands. Additionally, sage-grouse serve as an indicator of management's effects on other wildlife species that inhabit sagebrush communities. Therefore, the maintenance of this population is important to the continued population distribution across the TBNG and to the monitoring of other sagebrush obligate species.

The presence of WNV within TBNG sage-grouse populations and the resulting mortality rate (approximately 10% of infected birds) in populations previously exposed to WNV may alter the acceptable population levels for sage-grouse. Population levels considered acceptable 10 years ago might no longer be adequate to ensure recovery from other new impacts that may occur on the TBNG. The maintenance of widely distributed

populations may be more important to recover local populations and maintain population viability should WNV become more prevalent.

The Hilight Bill Geographic Area, including the Black Thunder Mine Analysis Area, represents approximately 17% of the potential sage-grouse habitat within the TBNG. Despite continuing losses of known and potential sage-grouse habitat in that area, significant (83%) blocks of suitable, occupied habitat remain across the TBNG. If mining and non-mining activities, and their associated development, do not occur in many more of the other Geographic Areas, it appears that sage-grouse may remain well-distributed across the planning unit.

In summary, with significant blocks of suitable, occupied habitat remaining across the Thunder Basin National Grassland and if development or disease does not occur in many more of these areas, it appears that sage-grouse are still viable and remain well distributed across the planning unit.

- To help protect sage-grouse the operator will notify the District Ranger, Douglas Ranger District, if any active sage-grouse leks in addition to those identified in this Biological Evaluation are located during construction or operation of the project.

### 3.7.4 Additional Species of Concern

#### Raptors

Only nests within the Project Area (USFS lands between the approved BTM lease areas and the mine permit boundary) could be physically impacted by the Proposed Action. However, all raptor nest sites identified within 0.5-mile of the Project Area are included in this discussion.

Fifty (50) raptor nest sites have been identified in the Project Area and surrounding 0.5-mile perimeter during raptor monitoring efforts over the last 25 years. Over time, many of those nests or nest sites have been destroyed by natural causes, relocated for mitigation, or removed by mining. At the end of the 2007 breeding season 16 nests or nest sites were still intact, and 34 were no longer physically present. Of the 50 total nest sites, seven (7) are designated as “active” (depending on the species, either occupied or of undocumented status during at least one year within the past seven consecutive years, or occupied within the current [2007] breeding season) according to USFS guidelines, although not all of those nests are present on USFS lands. Forty-three (43) of the 50 nests are considered “inactive” and are excluded from the analysis. Of the seven (7) “active” nest sites only one is present within the Project Area.

The seven active nests or nests sites consist of two ferruginous hawk nests, one golden eagle nest, one red-tailed hawk (*Buteo jamaicensis*) nest, one ferruginous/red-tailed hawk nest, one golden eagle/red-tailed hawk nest, and one red-tailed hawk/great horned owl (*Bubo virginianus*) nest. Information regarding ferruginous hawks, burrowing owls, and short-eared owls was provided under *Analysis of Effects-Region 2 Sensitive Species*,

above. Information regarding bald eagle nests in the area was described above under *Analysis of Effects-Federally Listed Species*.

The one “active” golden eagle nest site is located along Little Thunder Creek in SW Section 24, T43N R71W. That nest is within a pair’s territory that also harbored other nests now considered inactive. Although no nesting activity has been observed at the nest since 2001, the pair has been seen in the vicinity each year since then. The nest was located within a Russian olive tree, and was destroyed by natural causes before the 2003 breeding season.

The four “active” red-tailed hawk nests are located either on platforms or in cottonwoods. One of the nests (in SE Section 27, T43N R70W) was built in 2005 in the same tree that had harbored a golden eagle nest in the 1980’s. The hawk pair successfully fledged young from that nest during the 2005 and 2006 breeding season. In 2007, one pair, appropriated the platform (in SW Section 13, T43N R71W) installed for and used by ferruginous hawks the previous year. That pair of red-tails fledged four young in 2007. One nest that was newly built and used by red-tails in a cottonwood in NE Section 26, T43N R70W in 2006, was occupied by a great-horned owl in 2007. The final red-tailed hawk nest was a platform, installed in SE NE Section 2, T42N R70W, in 2006. Red-tails fledges three young from that platform in 2007.

Potential impacts to the bald eagle, northern harrier, ferruginous hawk, burrowing owl, and short-eared owl were described in previous sections. Effects of the Proposed Action on golden eagles, Swainson’s hawks, and red-tailed hawks would be similar to those discussed for bald eagles and ferruginous hawks.

Throughout the life of the project, loss of or injury to individuals foraging or nesting within, or traveling through the Project Area may occur resulting from collisions with vehicles associated with ongoing and future mining and associated activities. These effects are expected to be minimal as vehicle speeds would be sufficiently low to avoid any large, conspicuous raptors. Individuals also may be killed or injured by collisions with power lines or fence lines, and electrocutions. Potential nesting and foraging habitats (up to 2,990 acres during the life of mine) within the Project Area will be disturbed, altered, or removed by a variety of large- and small-scale mining operations (e.g., topsoil stripping, drilling, reservoir and facility construction). Considering tree nesting species, potential nest sites will be eliminated from the Project Area by the removal of trees. Potential nesting and foraging habitat might also be fragmented by linear disturbances such as the construction, maintenance, and removal of roads, fences, power lines, and pipelines. The linear disturbances would occur within narrow corridors over relatively short distances, typically over a period of days. Additionally, those structures are often constructed immediately prior to the removal of similar features elsewhere in the area, often resulting in minimal or no net gain of new linear disturbances. The type, timing, location, and extent of habitat disturbance will vary throughout the Project Area as operations progress. Reclamation of disturbed areas will occur incrementally as resource recovery is completed in a given portion of the mine, and will eventually mitigate impacts to some degree. Surface disturbing activities could also

result in a short-term, localized decrease in the prey base (small rodents and voles) for ferruginous hawks. However, due to their high reproductive potential and tendencies to re-invade and adapt to disturbed/reclaimed areas, prey numbers should increase quickly after the disturbance. Although individuals within the BTM monitoring area appear to have become habituated to mining activities, individuals may be displaced from potential foraging or nesting habitats due to the proximity of project activities.

TBCC has diligently avoided and mitigated impacts to individuals and nests as much as possible by monitoring nesting raptor populations, maintaining and implementing current USFWS approved Raptor Mitigation Plans (Copies of the current Plan are available in both the Cheyenne office of the USFWS, and the Douglas office of the USFS.), adjusting operations to provide temporal and spatial buffers around raptor nests, and ensuring that new power lines at the mine conform to the Avian Power Line Interaction Commission Guidelines (APLIC & USFWS 2005). Provided those practices are continued, direct impacts to golden eagles, red-tailed hawks, or other raptor species or active nest sites should be minimized.

Timing stipulations placed on the ferruginous hawk nests were discussed in the previous *Ferruginous hawk* section. No Grassland Plan stipulations will apply to the red-tailed hawk nests as all are located more than 0.125 mile, respectively, from proposed activities. However, all applicable Standards and Guidelines specific to golden eagle nests outlined in the Grassland Plan (USFS 2002) would be implemented. The following Grassland Plan Standards specific to golden eagle nests that would specifically apply to the Proposed Action can be found in Chapter 1 of the Plan on pages 1-20 and 1-21:

**73.** To help prevent abandonment, reproductive failure or nest destruction, prohibit development of new facilities within 0.5 mi (line of sight) of active golden eagle nests. For the golden eagle, a nest is no longer considered active if it is known to have been unoccupied for the last 7 years. This does not apply to pipelines, fences and underground utilities.

**74.** To help reduce disturbances to nesting golden eagles, prohibit the following activities within the 0.5 mile (line of sight) of active golden eagle nests from 1 February to 31 July: construction (e.g., roads, water impoundments, oil and gas facilities), reclamation, gravel mining operations, drilling of water wells, oil and gas drilling, timber harvest and fuel treatments, and precommercial thinning.

Annual monitoring of known raptor nests within the Project Area is recommended to document their histories of occupancy. Adherence to these Standards and Guidelines should ensure that nesting raptors would not be negatively affected by project related activities.

Additional impacts from the project and associated activities are not expected to increase the cumulative effects to a point that could negatively affect raptor populations. Should additional nests be located within species-specific buffers identified in the current Grassland Plan (USFS 2002), compliance with the appropriate timing stipulations would be required to protect nesting and/or potentially nesting raptors. The proposed activities

will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area for raptor species.

### Migratory Bird Species of Management Concern in Wyoming

In May 2002, the USFWS Ecological Services office in Cheyenne, WY released a revised list of 40 Migratory Bird Species of Management Concern in Wyoming for coal mines (Table 17). Fourteen of those 40 species are considered as Level I, which indicates a clear need for conservation action. Those same 14 species should also be evaluated for projects on USFS lands. Of those 40 species, one was addressed in the BA section, 11 were discussed in the BE section; one of those 11 was also the Management Indicator Species, and one was addressed in the Raptors section. Three other avian species of concern, the sage sparrow (*Amphispiza bellii*), peregrine falcon (*Falco peregrinus*), and yellow-billed cuckoo (*Coccyzus americanus*) were considered for evaluation in the BE but not selected due to the limited potential for occurrence in the Project Area resulting from the absence or paucity of appropriate habitat. Six of these species were not addressed in previous sections but could potentially occur on the Project Area and one-half mile (Table 17). Specifically: the upland sandpiper (*Bartramia longicauda*), red-headed woodpecker (*Melanerpes erthrocephalus*), sage thrasher (*Oreoscoptes montanus*), lark sparrow (*Chondestes grammacus*), vesper sparrow (*Pooecetes gramineus*), and lark bunting (*Calamospiza melanocorys*). All of these species have been documented within the Survey Area or vicinity during wildlife monitoring surveys conducted at the BTM. Eighteen species were not addressed in previous sections and have little potential for occurring within the Survey Area.

**Table 17: Habitat associations, status, and potential for occurrence of the 40 Migratory Bird Species of Management Concern for coal mines in Wyoming (Level I and II) within BTM Survey Area.**

Species	Primary Nesting Habitat(s)	Status/Occurrence in Local Area <sup>1</sup>	Potential for Occurrence Within Project Area
<b>Level I</b>			
Mountain plover <sup>S</sup> <i>Charadrius montanus</i>	Short-grass prairie, shrub-steppe	Uncommon breeder	Moderate
Long-billed curlew <sup>S</sup> <i>Numenius americanus</i>	Grasslands	Uncommon migrant	Low
<b>Upland sandpiper</b> <b><i>Bartramia longicauda</i></b>	Grasslands, shrub-steppe	Uncommon breeder	Moderate
Greater sage-grouse <sup>S, MIS</sup> <i>Centrocercus urophasianus</i>	Shrub-steppe	Year-round resident	High
Swainson's hawk <sup>RAP</sup> <i>Buteo swainsoni</i>	Grasslands	Common breeder	High
Ferruginous hawk <sup>S</sup> <i>Buteo regalis</i>	Shrub-steppe, grasslands	Common breeder	High
Peregrine falcon* <i>Falco peregrinus</i>	Cliffs	Rare migrant	Low
Bald eagle <sup>F</sup> <i>Haliaeetus leucocephalus</i>	Riparian	Common migrant, winter resident, possibly breeder	High

Species	Primary Nesting Habitat(s)	Status/Occurrence in Local Area <sup>1</sup>	Potential for Occurrence Within Project Area
Burrowing owl <sup>S</sup> <i>Athene cunicularia</i>	Grasslands, shrub-steppe	Uncommon breeder	High
Short-eared owl <sup>S</sup> <i>Asio flammeus</i>	Grasslands, shrub-steppe	Irregular breeder	Moderate
Sage sparrow* <i>Amphispiza belli</i>	Shrub-steppe, montane shrublands	No records	Low
Brewer's sparrow <sup>S</sup> <i>Spizella breweri</i>	Shrub-steppe, montane shrublands	Abundant breeder	High
Baird's sparrow <i>Ammodramus bairdii</i>	Shortgrass prairie	Uncommon migrant	Low
McCown's longspur <sup>S</sup> <i>Calcarius mccownii</i>	Short-grass prairie, shrub-steppe	Common breeder	High
<b>Level II</b>			
Common loon <i>Gavia immer</i>	Wetlands	Rare migrant	Low
Merlin <i>Falco columbarius</i>	Low elevation conifer	Uncommon	Low
Barn owl <i>Tyto alba</i>	Shortgrass prairie	Rare	Low
Eastern screech owl <i>Otus asio</i>	Riparian	No records	Low
Western screech owl <i>Otus kennicottii</i>	Riparian	No records	Low
Black-billed cuckoo <i>Coccyzus erythrophthalmus</i>	Riparian	No records	Low
Yellow-billed cuckoo* <i>Coccyzus americanus</i>	Riparian	No records	Low
Black-chinned hummingbird <i>Archilochus alexandri</i>	Riparian, shrub-steppe	No records	Low
<b>Red-headed woodpecker <i>Melanerpes erthrocephalus</i></b>	<b>Riparian, low elevation conifer</b>	<b>Nesting</b>	<b>Moderate</b>
Cassin's kingbird <i>Tyrannus vociferans</i>	Juniper woodland, riparian	No records	Low
Ash-throated flycatcher <i>Myiarchus cinerascens</i>	Juniper woodland	No records	Low
Sprague's pipit <i>Anthus spragueii</i>	Grasslands, riparian	No records	Low
Western scrub-jay <i>Aphelocoma coerulescens</i>	Juniper woodland	No records	Low
Bushtit <i>Psaltiriparus minimus</i>	Juniper woodland	No records	Low
Pygmy nuthatch <i>Sitta pygmaea</i>	Low elevation conifer	No records	Low
Marsh wren <i>Troglodytes troglodytes</i>	Wetlands	No records	Low
<b>Sage thrasher <i>Oreoscoptes montanus</i></b>	Shrub-steppe	Uncommon breeder	High
Western bluebird <i>Sialia mexicana</i>	Juniper woodland, low elevation conifer	No records	Low
Loggerhead shrike <sup>S</sup> <i>Lanius ludovicianus</i>	Shrub-steppe	Common breeder	High

Species	Primary Nesting Habitat(s)	Status/Occurrence in Local Area <sup>1</sup>	Potential for Occurrence Within Project Area
Bobolink <i>Dolichonyx oryzivorus</i>	Grassland	No records	Low
<b>Lark sparrow</b> <b><i>Chondestes grammacus</i></b>	Shrub-steppe	Common breeder	Moderate
Grasshopper sparrow <sup>S</sup> <i>Ammodramus savannarum</i>	Grassland	Common breeder	High
<b>Vesper sparrow</b> <b><i>Pooecetes gramineus</i></b>	Shrub-steppe	Abundant breeder	High
Chestnut-collared longspur <sup>S</sup> <i>Calcarius ornatus</i>	Grasslands	Common breeder	High
Dickcissel <i>Spiza Americana</i>	Grasslands	Rare migrant	Low
<b>Lark bunting</b> <b><i>Calamospiza melanocorys</i></b>	Grasslands, shrub-steppe	Abundant breeder	High

<sup>1</sup> Data from baselines and annual monitoring at local coal mines (1983-2007).

<sup>F</sup> Species addressed in Federally Listed species section.

<sup>S</sup> Species addressed in USFS Sensitive Species section.

<sup>MIS</sup> Species addressed in MIS section.

<sup>RAP</sup> Species addressed in Raptors section.

\* Species included on USFS Region 2 Sensitive Species List and considered for evaluation, but not selected because of the low potential for occurrence on the Project Area.

**Species not addressed in previous sections of this document that have been observed within the area or have at least moderate potential for occurrence on the Project Area are indicated by bold font.**

Five of the six previously un-addressed species nest and forage in upland grass or sagebrush-grassland habitats. Sage thrashers are sagebrush obligates. The lark bunting, vesper sparrow, and lark sparrow utilize both sagebrush and grass-dominated sites. Upland sandpipers prefer to forage and nest within grassland habitats. Throughout the life of the mine the direct loss of or injury to individuals or nests of these species may occur resulting from vehicle collisions or proposed activities within nesting areas. The disturbance, fragmentation, alternation, or removal of upland grass and sagebrush habitats in association with increased human activity and noise will likely displace pairs of those five species from historic nesting territories (Ingelfinger 2001, pg. 69). Fragmentation of habitats and the creation of linear habitat disturbances may provide convenient travel corridors for, and facilitate movement of, mammalian predators, thus increasing the predation risk to nesting adults, eggs, and nestlings. Mining related activities will likely alter and disturb all of the lands within the Project Area (4.7 mi<sup>2</sup>) over the life of the mine, and will therefore disturb, destroy, or fragment potential foraging or nesting habitat. The type, timing, location, and extent of habitat disturbance will vary throughout the Project Area as operations progress. These disturbances should only exert localized effects on populations of the discussed species. Reclamation of these sites and other sites within the mine lease both on and beyond the Survey Area will mitigate impacts on potential nesting and foraging habitats to some degree.

The red-headed woodpecker typically uses open and edge forest habitats and wooded riparian strips and are dependent on snags and decaying trees as nesting sites. This species forages in close proximity to these habitats. Although no nesting habitat is

present within the Project Area, individuals nesting nearby may forage within portions of the Project Area. Therefore potential impacts to red-headed woodpeckers would include the fragmentation, alteration, or destruction of potential foraging habitats and the displacement of individuals portions of said habitats due to the increase in associated traffic and noise associated with project activities.

In the past, lands within the Project Area, and the Hilight Bill geographic unit of the TBNG in general, have been used for livestock grazing, conventional oil and gas and CBNG development, surface coal mining and related activities, hunting, fishing, trapping, and dispersed recreation. In addition to the proposed project, future activities will probably include a continuation of those activities, and an increased rate of surface coal mining and CBNG development. Impacts of the proposed activities compounded by other potential new developments (e.g. expanded rail lines for the transportation of coal and the construction and operation of a coal-fired power plant) and livestock grazing in the vicinity of the Project Area would likely negatively affect some individuals, breeding pairs, or nests of the six avian species discussed in this section. However, the project is not expected to increase the potential cumulative impacts to a point that will negatively impact populations of those species. The proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area and provide habitat for the migratory birds discussed in this section.

### **Waterfowl and Shorebirds**

Habitat for waterfowl, shorebirds, wading birds, and other wetland-associated species is relatively limited in southern Campbell County. Within the Project Area, foraging habitat is present but limited and only minimal nesting habitat is present for some wetland-associated birds. As described in the *Project Area* section of this report, potential wetland habitats within the Project Area are limited to Little Thunder Reservoir, portions of Little Thunder Creek (Specifically within Section 23, T43N, R71W and mine sedimentation and dust control ponds in portions of W $\frac{1}{2}$  Section 26, T43N, R70W.) Within the larger Survey Area water is also present at the flooded playa in Section 36, T43N, R71W and other small ephemeral drainages, stock reservoirs, and dugouts, some of which are currently receiving water discharged from existing CBNG development. The existing wetlands within the Project Area may also be utilized as migration stopover areas. In the past 25 years of wildlife monitoring for the BTM, waterfowl and shorebirds have been documented annually both within and in the vicinity of wetland habitats on the Project Area.

As most all habitats (including aquatic habitats) within the Project Area will be affected by the proposed activities, potential direct and indirect effects to breeding, nesting, and migrating waterfowl and shorebirds would occur. During the nesting and migration periods, individuals could be killed or injured by vehicles and equipment. Nests may be destroyed by equipment and eggs or nestlings killed if construction activities are conducted within potential nesting habitats (both upland and water edge), or if rising waters resulting from project activities (i.e. installation of a diversion dike) engulf nest sites. Additionally, the increased human activity and noise associated with project

activities may displace individuals and inhibit foraging or nesting within portions of the area. Foraging and potential nesting habitats (both upland and water edge) will be disturbed, destroyed, or fragmented by proposed activities. (Specifically, these habitats will be incrementally affected by a variety of large-and small-scale operations (e.g. topsoil stripping, drilling, reservoir or diversion channel construction, construction of facilities, and augmentation or dewatering of existing wetlands). The type, timing, location, and extent of habitat disturbance will vary throughout the Project Area as operations progress. Linear disturbances such as the construction, maintenance, and removal of roads, fences, power lines, and pipelines could create habitats that could provide convenient travel corridors for mammalian predators, thus increasing the predation risk to potentially nesting adults, eggs, and nestlings. Reclamation of both upland and wetland habitats would mitigate impacts on habitats to some extent, by providing potential nesting, breeding, or foraging habitats, and stop over or resting sites during migration.

Adherence to the Grassland Plan (USFS 2002) Standards and Guidelines pertaining to water and wetlands should ensure that aquatic organisms or plants on which waterfowl and shorebirds prey, and the quality of existing wetlands will not be negatively affected by increased sedimentation or degraded water chemistry resulting from the proposed activities.

Impacts of the proposed activities compounded by other existing and potential new developments would likely negatively affect some individuals, breeding pairs, or potential breeding, nesting, foraging, or migration stop over habitats. However, the project is not expected to increase the potential cumulative impacts to a point that will negatively impact populations of those species. The proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area and provide habitat for the waterfowl or shorebirds.

## 4.0 CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

### ***ID TEAM MEMBERS:***

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Cheyenne and Arapaho Tribes	Watonga, OK
Cheyenne River Lakota Tribal Council	Eagle Butte, SD
Crow Nation Chairman	Crow Agency, MT
Fort Peck Assiniboine & Sioux Tribes	Poplar, MT
Hunkpapa-Santee-Sioux Tribe	Poplar, MT
Lower Brule Sioux Tribe	Lower Brule, SD
Northern Arapaho Business Council	Ft. Washakie, WY
Northern Cheyenne Tribal Council	Lame Deer, MT
Oglala Sioux Tribe	Pine Ridge, SD
Rosebud Sioux Tribe	Rosebud, SD
Shoshone Business Council	Ft. Washakie, WY
Standing Rock Lakota Tribal Council	Fort Yates, ND
Three Affiliated Tribes Business Council	New Town, ND

### **FEDERAL AND STATE AGENCIES AND LOCAL GOVERNMENTS**

Buffalo Field Office, Bureau of Land Management	Buffalo, WY
Campbell County Commissioners	Gillette, WY
Rep. Barbara Cubin	Casper, WY
Senator Craig Thomas	Casper, WY
Senator Michael B Enzi	Gillette, WY
State Representative John Hines	Gillette, WY
State Representative Jeff Wasserburger	Gillette, WY
State Senator Jim Anderson	Glenrock, WY
State Senator Dick Erb	Gillette, WY
Town of Wright (Mayor)	Wright, WY
US Fish and Wildlife Service, Ecological Services	Cheyenne, WY
USDI Office of Surface Mining	Casper, WY
WY Geological Survey	Laramie, WY

Wyoming Department of Agriculture	Cheyenne, WY
Wyoming Department of Environmental Quality-Land Quality	Cheyenne, WY
Wyoming Department of Environmental Quality-Air Quality	Cheyenne, WY
Wyoming Department of Environmental Quality-Water Quality	Cheyenne, WY
Wyoming Game and Fish Department	Cheyenne, WY
Wyoming State Engineer	Cheyenne, WY
Wyoming State Historic Preservation Office	Cheyenne, WY
Wyoming State Lands and Investments	Cheyenne, WY
Wyoming State Planning Office	Cheyenne, WY
Wyoming Water Development Commission	Cheyenne, WY

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Thomas and Leah Edwards	Gillette, WY
Kennecott Energy (Rio Tinto Energy)	Gillette, WY
Kinder Morgan	Billings, MT
Patricia and Gene Litton	Gillette, WY
National Wildlife Federation	Boulder, CO
Powder River Basin Resource Council	Sheridan, WY
Powder River Coal Company	Gillette, WY
Sierra Club-Northern Plains	Sheridan, WY
Robert Stoddard	Douglas, WY
Paul and Ruby Stuart	Gillette, WY
Dan Tracy	Gillette, WY
Thunder Basin Coal	Wright, WY
Thunder Basin Grasslands Prairie Ecosystem Assn	Douglas, WY
Thunder Basin Grazing Association	Douglas, WY
Thunder Basin Resource Coalition	Douglas, WY
Wendell Funk	Quincy, IL
Western Gas Resources	Denver, CO
Williams Production RMT Company	Gillette, WY
Wyoming Outdoor Council	Lander, WY
Wyoming Public Lands Council	Casper, WY
Wyoming Stock Growers Assn	Cheyenne, WY
Wyoming Wildlife Federation	Cheyenne, WY

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# **APPENDIX A: RESPONSE TO COMMENTS**