APPENDIX H

BLM SENSITIVE SPECIES
AND
USFS REGION 2 SENSITIVE SPECIES AND
MANAGEMENT INDICATOR SPECIES EVALUATIONS
FOR THE
WRIGHT AREA COAL LEASE APPLICATIONS EIS

TABLE OF CONTENTS

H-1.0 PROJECT AREA DESCRIPTIONS H-1
H-1.1 North Hilight Field, South Hilight Field, and West Hilight Field LBA Tracts H-1
H-1.2 West Jacobs Ranch LBA Tract H-1
H-1.3 North and South Porcupine LBA Tracts H-2
H-1.4 Description of General Analysis Areas H-2

H-2.0 BLM SENSITIVE SPECIES EVALUATION H-3
H-2.1 Introduction H-3
H-2.2 Species Habitat and Occurrence H-3

H-3.0 USFS REGION 2 SENSITIVE SPECIES EVALUATION H-16
H-3.1 Introduction H-16
H-3.2 Species Habitat and Occurrence on USFS Lands Within the General Wright Analysis Area, and the Direct and Indirect Direct Effects on Those Species H-24
H-3.2.1 Prairie moonwort H-31
H-3.2.2 Narrowleaf moonwort H-32
H-3.2.3 Leathery grapefern H-33
H-3.2.4 Foxtail sedge H-33
H-3.2.5 Elliptic spikerush H-34
H-3.2.6 Hall's fescue H-35
H-3.2.7 Wood lily H-35
H-3.2.8 Largeflower triteleia H-36
H-3.2.9 Barr's milkvetch H-37
H-3.2.10 Smooth goosefoot H-38
H-3.2.11 Flat-top goldentop H-38
H-3.2.12 Rosy palafox H-39
H-3.2.13 Lemonscent H-40
H-3.2.14 Larchleaf beardtongue H-41
H-3.2.15 Wooly twinpod H-41
H-3.2.16 Visher's buckwheat H-42
H-3.2.17 Highbush-cranberry H-43
H-3.2.18 Northern leopard frog H-43
H-3.2.19 Black-tailed prairie dog H-51
H-3.2.20 Swift Fox H-59
H-3.2.21 Long-billed curlew H-64
H-3.2.22 Ferruginous hawk H-66
H-3.2.23 Burrowing owl H-72
H-3.2.24 Chestnut-collared longspur H-83
H-3.2.25 McCown's Longspur H-85
H-3.2.26 Greater sage-grouse H-87
H-3.2.27 Bald eagle H-100
H-3.2.28 Mountain plover H-104
H-3.2.29 Loggerhead shrike H-107
H-3.2.30 Brewer's sparrow H-110

TABLE OF CONTENTS (Continued)

H-4.0 CUMULATIVE EFFECTS REGARDING SENSITIVE SPECIES..... H-112
H-4.1 Species Associated Primarily With Short Grasses or Prairie Dog Colonies H-113
H-4.2 Mixed Sagebrush and/or Mid-grass Species H-114
H-4.3 Sagebrush Obligates.....H-114
H-4.4 Tree or Wetland/Aquatic Species H-115

H-5.0 TBNG PLAN COMPLIANCE..... H-116

H-6.0 REQUIRED MITIGATION AND RECOMMENDED MONITORING.H-116

H-7.0 USFS MANAGEMENT INDICATOR SPECIES EVALUATION..... H-117
H-7.1 Introduction H-117
H-7.2 Species Evaluated and Rationale H-117

H-8.0 REFERENCES AND LITERATURE CITED H-119

LIST OF TABLES

Table H-1. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the North Hilight Field LBA Tract H-4

Table H-2. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the South Hilight Field LBA Tract..... H-6

Table H-3. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Hilight Field LBA Tract..... H-8

Table H-4. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Jacobs Ranch LBA Tract.....H-10

Table H-5. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the North Porcupine LBA Tract.....H-12

Table H-6. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the South Porcupine LBA Tract H-14

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (USFS 2007).....H-17

TABLE OF CONTENTS (Continued)

Table H-8. USFS Region 2 Sensitive Species Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (Provided by USFS Douglas Ranger District, July 2007) H-21

Table H-9. USFS Region 2 Species of Local Concern Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (provided by Roche 2009) H-23

LIST OF FIGURES

Figure H-1. USFS Region 2 Sensitive Wildlife Species Survey Area for the North Hilight Field LBA Tract H-26

Figure H-2. USFS Region 2 Sensitive Wildlife Species Survey Area for the South Hilight Field LBA Tract H-27

Figure H-3. USFS Region 2 Sensitive Wildlife Species Survey Area for the West Hilight Field LBA Tract.....H-28

Figure H-4. USFS Region 2 Sensitive Wildlife Species Survey Area for the North Porcupine LBA Tract.....H-29

Figure H-5. USFS Region 2 Sensitive Wildlife Species Survey Area for the South Porcupine LBA Tract H-30

H-1.0 PROJECT AREA DESCRIPTIONS

H-1.1 North Hilight Field, South Hilight Field, and West Hilight Field LBA Tracts

Under the Proposed Actions for the North Hilight Field, South Hilight Field, and West Hilight Field LBA Tracts, Bureau of Land Management (BLM) would hold a separate competitive lease sale and issue a separate lease for the federal coal lands included in each tract as applied for by the applicant, Ark Land Company (ALC), or under other Alternatives (see Figures 2-1, 2-2, and 2-3, respectively, and land descriptions in Sections 2.1, 2.2, and 2.3, respectively, of this EIS). In each case, it is assumed that the applicant for the tracts, ALC, would be the successful bidder on each tract, and that the tract would be mined as a maintenance lease for the existing Black Thunder Mine.

The surface estate on the North Hilight Field LBA Tract as applied for is composed of privately owned lands. Under Alternative 2, additional lands, including federal lands managed by U.S. Department of Agriculture-Forest Service (USFS), were added by BLM to be analyzed for possible inclusion in that tract. The surface estate on the South Hilight Field LBA Tract as applied for is composed of privately owned and federally owned lands managed by USFS. Under Alternative 2, additional lands, including federal lands managed by USFS, were added by BLM to be analyzed for possible inclusion in that tract. The surface estate on the West Hilight Field LBA Tract as applied for is composed of privately owned and federally owned lands managed by USFS. Under Alternatives 2 and 3, additional lands, including federal lands managed by USFS, were added by BLM to be analyzed for possible inclusion in that tract. Additional information on surface ownership and current land uses can be found in Section 3.11 of this EIS. All of these federally owned lands administered by the USFS are within the Thunder Basin National Grasslands (TBNG).

H-1.2 West Jacobs Ranch LBA Tract

Under the Proposed Action for the West Jacobs Ranch LBA Tract, BLM would hold a competitive lease sale and issue a lease for the federal coal lands included in the tract as applied for by the applicant, Jacobs Ranch Coal Company (JRCC), or under another Alternative (see Figure 2-4 and land descriptions in Section 2.4 of this EIS).

The Jacobs Ranch Mine was acquired by Arch Coal, Inc. on October 1, 2009. ALC, a wholly-owned subsidiary of Arch Coal, Inc., will integrate the mining operations of the Jacobs Ranch Mine with the mining operations of the Black Thunder Mine. ALC's intention is to consolidate the permits for the Jacobs Ranch Mine and the Black Thunder Mine. In this Biological Evaluation (BE), the applicant for the West Jacobs Ranch LBA Tract will henceforth be referred to as ALC. It is assumed that the applicant for the tract, ALC, would be the

successful bidder, and that the tract would be mined as a maintenance lease for the existing Jacobs Ranch Mine.

The surface estate on the West Jacobs Ranch LBA Tract as applied for is composed entirely of privately owned lands. Under Alternative 2, additional lands, all privately owned, were added by BLM to be analyzed for possible inclusion in that tract. Additional information on surface ownership and current land uses can be found in Section 3.11 of this EIS.

H-1.3 North and South Porcupine LBA Tracts

Under the Proposed Actions for the North Porcupine and South Porcupine LBA Tracts, BLM would hold a separate competitive lease sale and issue a separate lease for the federal coal lands included in each tract as applied for by the applicant, BTU Western Resources, Inc. (BTU), or under other Alternatives (see Figures 2-5 and 2-6, respectively, and land descriptions in Sections 2.5 and 2.6, respectively, of this EIS). In each case, it is assumed that the applicant for the tracts, BTU, would be the successful bidder on each tract, and that the tract would be mined as a maintenance lease for the existing North Antelope Rochelle Mine.

The surface estate on the North Porcupine LBA Tract as applied for is composed of privately owned and federally owned lands managed by USFS. Under Alternative 2, additional lands, including federal lands managed by USFS, were added by BLM to be analyzed for possible inclusion in that tract. The surface estate on the South Porcupine LBA Tract as applied for is composed of privately owned and federally owned lands managed by USFS. Under Alternative 2, additional lands, including federal lands managed by USFS, were added by BLM to be analyzed for possible inclusion in that tract. Additional information on surface ownership and current land uses can be found in Section 3.11 of this EIS. All of these federally owned lands administered by the USFS are within the TBNG.

H-1.4 Description of General Analysis Areas

The BLM study area for each of these six LBA tracts is defined as the original tract as applied for, plus all lands that BLM is considering adding to the tract. The general analysis area for each of these six LBA tracts is defined as the BLM study area plus surrounding lands within a ¼-mile perimeter that could be disturbed by mining the coal within the BLM study area where future mining disturbance could occur. The general analysis area for the North Hilight Field LBA Tract does not include lands within Black Thunder Mine's current permit area. The general analysis area for the South Hilight Field LBA Tract includes some lands within Black Thunder Mine's current permit area. The general analysis area for the West Hilight Field LBA Tract does not include lands within Black Thunder Mine's current permit area. The general analysis area for the West Jacobs Ranch LBA Tract does not include lands within Jacobs Ranch Mine's current permit area. The general analysis area for the North Porcupine

LBA Tract is almost entirely within North Antelope Rochelle Mine's current permit area. The general analysis area for the South Porcupine LBA Tract is almost entirely within North Antelope Rochelle Mine's current permit area. For the purpose of this sensitive species evaluation, the general Wright analysis area is defined as the area encompassing all six of these LBA tracts' general analysis areas.

The minerals within the general analysis area for each of these six LBA tracts are managed by BLM, and the federally owned surface within these general analysis areas are administered by the USFS; therefore, both BLM and USFS sensitive species evaluations must be completed as part of this EIS.

H-2.0 BLM SENSITIVE SPECIES EVALUATION

H-2.1 Introduction

BLM Wyoming has prepared a list of sensitive species to focus species management efforts towards maintaining habitats under a multiple use mandate. The authority for this policy and guidance comes from the Endangered Species Act (ESA), as amended; Title II of the Sikes Act, as amended; the Federal Land Policy Management Act of 1976 (FLPMA) (43 U.S.C. 1716); Department Manual 235.1.1A; and BLM Manual 6840.06 E. Sensitive Species.

The goals of BLM's sensitive species policy are to:

- Maintain vulnerable species and habitat components in functional BLM ecosystems.
- Ensure sensitive species are considered in land management decisions.
- Prevent a need for species listing under the ESA.
- Prioritize needed conservation work with an emphasis on habitat.

H-2.2 Species Habitat and Occurrence

BLM sensitive species were listed for their ranges within the BLM Buffalo Field Office (24 species total). Some sensitive species could or do occur within one or more of the general analysis areas for these six LBA tracts. Specialized habitat requirements (i.e., caves, cliffs, coniferous forests, calcareous rock outcrops) make occupation for other sensitive species unlikely.

Tables H-1 through H-6 list BLM sensitive species, summarize their habitat requirements, and indicate if they have been observed on or around the general analysis areas for the LBA tracts. These tables represent the most current sensitive species lists (BLM 2002), and observations were based on field surveys and file searches completed in 2007 and 2008. Additional information on occurrences of these species on the tracts and surrounding wildlife survey areas can be found in Section 3.10 of this EIS.

Table H-1. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the North Hilight Field LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	No[1]
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	Yes, Uncommon Breeder
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Common Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Historic Common Breeder, Recent Occasional Breeder
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Forager
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Infrequent Migrant
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No[1]
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No[1]
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No[1]
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-1. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the North Hilight Field LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	No
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited

[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

Table H-2. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the South Hilight Field LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	No[1]
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No[1]
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	No
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Common Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	No
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Potential Breeder
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Infrequent Migrant
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No[1]
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No[1]
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No[1]
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-2. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the South Hilight Field LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	No[1] (one sighting in 24 years of annual monitoring)
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited

[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

Table H-3. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Hilight Field LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	No
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	No (one nest burrow just beyond general analysis area)
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Common Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	No, Infrequent Breeder
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Potential Breeder
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Infrequent Migrant
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No[1]
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No[1]
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-3. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Hilight Field LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	No[1]
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited
[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

Table H-4. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Jacobs Ranch LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	Yes, Breeder
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	Yes, Breeder
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Common Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Historic Breeder
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Rare Spring Migrant, Uncommon Potential Breeder
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No, Limited Habitat, Migrant
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No[1]
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-4. BLM Sensitive Species for the Buffalo Field Office, Habitat Requirements, and Observations within the General Analysis Area for the West Jacobs Ranch LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	Yes, Opportunistic Sightings (Spring and Fall, 2007)
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No[1]
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited
[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

Table H-5. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the North Porcupine LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	No[1]
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	Yes, Uncommon Breeder
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Common Breeder
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Infrequent Migrant
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No[1]
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No[1]
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No[1]
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-5. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the North Porcupine LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	No[1]
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited
[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

Table H-6. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the South Porcupine LBA Tract.

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Amphibians		
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	No[1]
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	No[1]
Birds		
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	No[1]
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	Yes, Common Breeder
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	No
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	Yes, Historic Breeder
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	No
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	Yes, Infrequent Migrant
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	No[1]
Peregrine falcon (*Falco peregrinus*)	Cliffs usually along waterways	No[1]
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	No[1]
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	Yes, Uncommon Breeder
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	No[1]
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	No[1]
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	No[1]

Table H-6. BLM Sensitive Species for the Buffalo Field Office and Habitat Requirements and Observations within the General Analysis Area for the South Porcupine LBA Tract (Continued).

Common Name (*scientific name*)	**Habitat**	**Field Observations**
Fish		
Yellowstone cutthroat trout (*Oncoryhynchus clarki*)	Cold water streams and lakes	No[1]
Mammals		
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	No[1]
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	No[1]
Spotted bat *(Euderma maculatum)*	Cliffs over perennial water, basin-prairie shrub	No[1]
Swift fox (*Vulpes velox*)	Grasslands	No
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines	No
Plants		
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes; 5,300-6,500 ft. elev.	No
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides; 6,000-8,300 ft. elev.	No[1]

[1] Habitat generally lacking or very limited
[2] Former listed or candidate species under the ESA automatically revert to BLM Sensitive Species upon delisting or removal from the ESA listing process.

H-3.0 USFS REGION 2 SENSITIVE SPECIES EVALUATION

H-3.1 Introduction

Species that have been identified by the Regional Forester as sensitive species must be considered for the Wright Area Coal Lease Applications because the general analysis areas for North Hilight Field, South Hilight Field, West Hilight

Field, North Porcupine, and South Porcupine LBA Tracts include federal lands administered by the USFS. There is no USFS administered surface within the general analysis area for the West Jacobs Ranch LBA Tract. The purpose of this section of this Appendix is to provide information about the potential environmental effects that leasing the USFS administered lands would have on USFS Region 2 Sensitive wildlife and vegetative species (terrestrial and aquatic).

USFS classifies species as "sensitive" when they meet one or more of the following three criteria: 1) the species is declining in numbers or occurrences, and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend; 2) the species' habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline; and 3) the species' population or habitat is stable but limited. In addition to these criteria, a ranking system is used to identify species for sensitive status, which is outlined in USFS Manual 2670-2671. Table H-7 lists species that have been identified as "sensitive" for USFS Region 2, TBNG (USFS 2007). This table also provides information about the status of the species on the TBNG as a whole (not exclusive to USFS lands within the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts).

The USFS Douglas Ranger District has reviewed the entire list of animal and plant sensitive species for USFS Region 2 and eliminated from further review those species that occur on the TBNG but are geographically or biologically outside of any effects of the Wright Area Coal Lease Applications. Tables H-8 and H-9 list the current status of USFS Region 2 sensitive species and species of local concern on TBNG and on USFS lands in the general Wright analysis area. These tables also indicate suitability of habitat for each species specific only to the USFS lands in the general Wright analysis area. The seven plant species that are listed in Table H-9 were moved off the Region 2 sensitive species list and are now species that are of local concern (Roche 2009). The species listed in Tables H-8 and H-9 have been identified as definitely or potentially inhabiting the USFS lands within the general Wright analysis area, either seasonally or year-round, and therefore may be potentially affected by one or more of the Proposed Actions or Alternatives.

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (USFS 2007).

Status Code:
K = Known occurrence in vicinity. Date of last observation indicates that species still occur in area.
N = No recent observations; surveys recently completed; may be historic records; potential habitat possible.
S = Suspected occurrence. May be historic records but no recent observations. Suitable habitat likely.
U = Unknown occurrence, more surveys may be needed, may be historic records, potential habitat possible.
D = Dismissed from further analysis. The proposed project area is located outside of the species current and historic distribution.

Scientific Name	**Common Name**	**Status on TBNG**
Plants: Ferns and Allies		
Botrychium ascendens	Trianglelobe moonwort	U
Botrychium campestre	Prairie moonwort	S
Botrychium furcatum	Forkleaved moonwort	U
Botrychium lineare	Narrowleaf moonwort	S
Botrychium paradoxum	Peculiar moonwort	U
Lycopodium complanatum	Crowfoot clubmoss	U
Selaginella selaginoides	Northern spike-moss	U
Plants: Monocots		
Amerorchis rotundifolia	Round leaved orchid	U
Calochortus flexuosus	Weakstem mariposalily	U
Carex alopecoidea	Foxtail sedge	S
Carex diandra	Lesserpanicled sedge	U
Carex livida	Livid sedge	U
Cypripedium montanum	Mountain lady's slipper	U
Cypripedium parvijlorum	Smallyellow ladyslipper	U
Eleocharis elliptica	Elliptic spikerush	S
Epipactis gigantea	Giant helle borine	U
Eriophorum altaicum var. *neogaeum*	Altai cottongrass	U
Eriophorum chamissonis	Chamisso cottonsedge	U
Eriophorum gracile	Slender cottonsedge	U
Festuca hallii	Hall's Fescue	S
Kobresia simpliciuscula	Simple Kobresia	U
Liparis loeselii	Loesel's twayblade	U
Malaxis brachypoda	Adder's-mouth	U
Platanthera orbiculata	Large roundleafed orchid	U
Ptilagrostis porteri	Colorado Falseneedlegrass	U
Schoenoplectus hallii	Hall's bulrush	U
Triteleia grandiflora	Largeflower triteleia	S

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (Continued).

Scientific Name	**Common Name**	**Status on TBNG**
Plants: Dicots		
Aquilegia chrysantha var. *rydbergii*	Golden Columbine	U
Aquilegia laramiensis	Laramie Columbine	U
Armeria maritima var. *siberica*	Sea pink	U
Asclepias uncialis	Dwarf milkweed	U
Astragalus barrii	Barr's milkvetch	K
Astragalus leptaleus	Park milkvetch	U
Astragalus missouriensis var. *humistratus*	Missouri milkvetch	U
Astragalus proximus	Aztec milkvetch	U
Astragalus ripleyi	Ripleys milkvetch	U
Astragalus wetherillii	Wetherill milkvetch	U
Braya glabella	Smooth rockcress	U
Chenopodium cycloides	Sandhill goosefoot	U
Cirsium perplexans	Rocky Mountain thistle	U
Descurainia torulosa	Wind River tansymustard	U
Draba exunguiculata	Grays Peak whitlowgrass	U
Draba grayana	Hitchcock Gray's Peak whitlow-grass	U
Draba smithii	Smiths whitlow-grass	U
Drosera anglica	English sundew	U
Drosera rotundifolia	Roundleaf sundew	U
Eriogonum brandegeei	Brandegee wildbuckwheat	U
Eriogonum exilifolium	Drop-leaf wild buckwheat	S
Eriogonum visheri	Visher's buckwheat	S
Gilia sedifolia	Purple false gily-flower	U
Ipomopsis aggregata ssp. *weberi*	Weber's scarlet gilia	U
Ipomopsis globularis	Globe gilia	U
Ipomopsis polyantha	Pagosa skyrocket	U
Lesquerella fremontii	Fremont's bladderpod	U
Lesquerella pruinosa	Pagosa Springs bladderpod	U
Machaeranthera coloradoensis	Colorado tansymustard	U
Mimulus gemmiparus	Weber's monkeyflower	U
Neoparrya lithophila	Rock-loving aletes	U
Oenothera harringtonii	Harrington's oenothera	U
Oreoxis humilis	Pikes Peak spring parsley	U
Parnassia kotzebuei	Kotzebue's grass-of-Parnassus	U
Penstemon absarokensis	Absaroka penstemon	U

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (Continued).

Scientific Name	**Common Name**	**Status on TBNG**
Plants: Dicots (continued)		
Penstemon caryi	Cary beardtongue	U
Penstemon degeneri	Degener's penstemon	U
Penstemon harringtonii	Harrington's beardtongue	S
Phacelia scopulina var. *submutica*	Debeque scorpionweed	U
Physaria didymocarpa var. *lanata*	Woolly twinpod	S
Physaria pulvinata	Cushion bladderpod	U
Potentilla rupincola	Front Range cinquefoil	U
Primula egaliksensis	Greenland primrose	U
Pyrrocoma carthamoides var. *subsquarrosa*	Absoroka goldenweed	U
Pyrrocoma clementis var. *villosa*	Tranquil goldenweed	U
Pyrrocoma integrifolia	Many-stemmed goldenweed	U
Ranunculus karelinii	Frosty buttercup	U
Rubus arcticus ssp. *acaulis*	Arctic bramble	U
Salix arizonica	Arizona willow	U
Salix barrattiana	Barrat willow	U
Salix candida	Sage willow	U
Salix myrtillifolia	Myrtleleaf willow	U
Salix serissima	Autumn willow	U
Sanguinaria canadensis	Bloodroot	U
Shoshonea pulvinata	Shoshonia	U
Thalictrum heliophilum	Sun-loving meadowrue	U
Townsendia condensata var. *anomala*	Cushion townsenddaisy	U
Utricularia minor	Lesser bladderpod	U
Viburnum opulus var. *americanum*	Highbush-cranberry	S
Viola selkirkii	Great-spurred violet	U
Fish		
Nocomis biguttatus	Hornyhead chub	D
Couesius plumbeus	Lake chub	U
Gila pandora	Rio Grande chub	D
Gila robusta	Roundtail chub	D
Macrhybopsis gelida	Sturgeon chub	U
Phoxinus neogaeus	Finescale dace	U
Margariscus margarita	Pearl dace	U

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (Continued).

Scientific Name	**Common Name**	**Status on TBNG**
Fish (continued)		
Phoxinus eos	Northern redbelly dace	D
Phoxinus erythrogaster	Southern redbelly dace	D
Platygobio gracilis	Flathead chub	K
Hybognathus placitus	Plains minnow	K
Catostomus discobulus	Bluehead sucker	D
Catostomus latipinnis	Flannelmouth sucker	D
Catostomus platyrynchus	Mountain sucker	D
Catostomus plebeius	Rio Grande sucker	D
Oncorhynchus clarki pleuriticus	Colorado River cutthroat trout	D
Oncorhynchus clarki bouvieri	Yellowstone cutthroat trout	D
Oncorhynchus clarki virginalis	Rio Grande cutthroat trout	D
Invertebrates		
Somatochlora hudsonica	Hudsonian emerald butterfly	U
Speyeria nokomis nokomis	Great Basin silverspot butterfly	U
Hesperia ottoe	Ottoe skipper butterfly	U
Speyeria idalia	Regal fritillary	S
Reptiles and Amphibians		
Rana pipiens	Northern leopard frog	K
Storeria occipitomaculata pahasapae	Black Hills redbelly snake	S
Mammals		
Euderma maculatum	Spotted bat	K
Corynorhinus townsendii	Townsend's big-eared bat	K
Myotis thysanodes	Fringed myotis	K
Cynomys ludovicianus	Black-tailed prairie dog	K
Vulpes velox	Swift fox	K
Birds		
Cygnus buccinator	Trumpeter swan	U
Botaurus lentiginosus	American bittern	U
Coccyzus americanus	Yellow-billed cuckoo	K
Numenius americanus	Long-billed curlew	K
Buteo regalis	Ferruginous hawk	K
Accipiter gentilis	Northern goshawk	K

Table H-7. USFS Region 2 Sensitive Species List and Status for the Entire Thunder Basin National Grassland (Continued).

Scientific Name	**Common Name**	**Status on TBNG**
Birds (continued)		
Circus cyaneus	Northern harrier	K
Athene cunicularia	Burrowing owl	K
Asio flammeus	Short-eared owl	K
Calcarius ornatus	Chestnut-collared longspur	K
Calcarius mccownii	McCown's longspur	K
Centrocercus urophasianus	Greater sage-grouse	K
Haliaeetus leucocephalus	Bald eagle	K
Charadrius montanus	Mountain plover	K
Lanius ludovicianus	Loggerhead shrike	K
Spizella breweri	Brewer's sparrow	K
Ammodramus savannarum	Grasshopper sparrow	K
Amphispiza billneata	Sage sparrow	U
Chlidonias niger	Black tern	K
Melanerpes lewis	Lewis' Woodpecker	K

Table H-8. USFS Region 2 Sensitive Species Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (Provided by USFS Douglas Ranger District, July 2007).

Common Name (*Scientific Name*)	**Status on TBNG/Status on USFS Lands in General Wright Analysis Area**	**Suitability of Habitat on USFS Lands in General Wright Analysis Area**
Plants: Ferns and Allies		
Prairie moonwort (*Botrychium campestre*)	Undocumented/Undocumented	Very Poor to Unsuitable Habitat
Narrowleaf moonwort (*Botrychium lineare*)	Undocumented/Undocumented	Unsuitable Habitat
Leathery grapefern (*Botrychium multifidum* var. *coulteri*)	Undocumented/Undocumented	Unsuitable Habitat
Plants: Monocots		
Foxtail sedge (*Carex alopecoidea*)	Undocumented/Undocumented	Unsuitable Habitat
Elliptic spikerush (*Eleocharis elliptica*)	Undocumented/Undocumented	Unsuitable Habitat

Table H-8. USFS Region 2 Sensitive Species Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (Provided by USFS Douglas Ranger District, July 2007) (Continued).

Common Name (*Scientific Name*)	**Status on TBNG/Status on USFS Lands in General Wright Analysis Area**	**Suitability of Habitat on USFS Lands in General Wright Analysis Area**
Plants: Monocots (Continued)		
Hall's fescue (*Festuca hallii*)	Undocumented/Undocumented	Unsuitable Habitat
Largeflower triteleia (*Triteleia grandiflora*)	Undocumented/Undocumented	Unsuitable Habitat
Plants: Dicots		
Barr's milkvetch (*Astragalus barrii*)	Documented/Undocumented	Suitable Habitat
Woolly twinpod (*Physaria didymocarpa* var. *lanata*)	Undocumented/Undocumented	Marginal Habitat
Visher's buckwheat (*Eriogonum visheri*)	Tentatively Documented/Undocumented	Unsuitable Habitat
Highbush-cranberry (*Viburnum opulus* var. *americanum*)	Undocumented/Undocumented	Unsuitable Habitat
Amphibians		
Northern leopard frog (*Rana pipiens*)	Documented/No Observations	Poor to Unsuitable Habitat
Fish		
Flathead Chub (*Platygobio gracilis*)	Documented/Undocumented	Unsuitable Habitat
Plains minnow (*Hybognathus placitus*)	Documented/Undocumented	Unsuitable Habitat
Mammals		
Black-tailed prairie dog (*Cynomys ludovicianus*)	Documented/Documented	Limited to Unsuitable Habitat
Swift fox (*Vulpes velox*)	Documented/No Observations	Suitable to Unsuitable Habitat
Birds		
Long-billed curlew (*Numenius americanus*)	Documented/No Observations	Foraging Habitat
Ferruginous hawk (*Buteo regalis*)	Documented/Documented	Suitable Habitat

Table H-8. USFS Region 2 Sensitive Species Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (Provided by USFS Douglas Ranger District, July 2007) (Continued).

Common Name (*Scientific Name*)	**Status on TBNG/Status on USFS Lands in General Wright Analysis Area**	**Suitability of Habitat on USFS Lands in General Wright Analysis Area**
Birds (Continued)		
Burrowing owl (*Athene cunicularia*)	Documented/Documented	Limited Suitable Habitat
Chestnut-collared longspur (*Calcarius ornatus*)	Documented/Documented	Limited Suitable Habitat
McCown's longspur (*Calcarius mccownii*)	Documented/Documented	Poor to Marginal Habitat
Greater sage-grouse (*Centrocercus urophasianus*)	Documented/Documented	Suitable to Unsuitable Habitat
Bald eagle (*Haliaeetus leucocephalus*)	Documented/Documented	Suitable Rangeland Foraging Habitat
Mountain Plover (*Charadrius montanus*)	Documented/No Observations	Suitable to Unsuitable Habitat
Loggerhead shrike (*Lanius ludovicianus*)	Documented/Documented	Marginal Habitat
Brewer's sparrow (*Spizella breweri*)	Documented/Documented	Suitable to Unsuitable Habitat

Table H-9. USFS Region 2 Species of Local Concern Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (provided by Roche 2009).

Common Name (*Scientific Name*)	**Status on TBNG/Status on USFS Lands in General Wright Analysis Area**	**Suitability of Habitat on USFS Lands in General Wright Analysis Area**
Plants: Monocots		
Wood (wild) lily (*Lilium philadelphicum*)	Undocumented/Undocumented	Unsuitable Habitat

Table H-9. USFS Region 2 Species of Local Concern Status on TBNG and on USFS Lands Within the General Wright Analysis Area, and Habitat Suitability on USFS Lands Within the General Wright Analysis Area (provided by Roche 2009) (Continued).

Common Name (*Scientific Name*)	**Status on TBNG/Status on USFS Lands in General Wright Analysis Area**	**Suitability of Habitat on USFS Lands in General Wright Analysis Area**
Plants: Dicots		
Smooth goosefoot (*Chenopodium subglabrum*)	Undocumented/Undocumented	Unsuitable Habitat
Flat-top (fragrant) goldentop (goldenrod) (*Euthamia graminifolia*)	Undocumented/Undocumented	Unsuitable Habitat
Rosy palafox (*Palafoxia rosea* var. *macrolepis*)	Documented/Undocumented	Suitable Habitat
Lemonscent (crown-seed fetid-marigold) (*Pectis angustifolia*)	Documented/Undocumented	Suitable Habitat
Larchleaf beardtongue (*Penstemon laricifolius* ssp. e*xifolius*)	Undocumented/Undocumented	Marginal Habitat

H-3.2 Species Habitat and Occurrence on USFS Lands Within the General Wright Analysis Area, and the Direct and Indirect Direct Effects on Those Species

Site-specific data on the occurrence of USFS Region 2 Sensitive Species on USFS lands within the general Wright analysis area were obtained from the Wyoming Department of Environmental Quality/Land Quality Division (WDEQ/LQD) permit applications and annual reports for the Black Thunder, Jacobs Ranch, and North Antelope Rochelle mines, the Rocky Mountain Herbarium, the Wyoming Natural Diversity Database, and the USFS.

Baseline and annual wildlife surveys have been conducted for the three applicant mines (Black Thunder, Jacobs Ranch and North Antelope Rochelle) since the early 1980s. WDEQ/LQD guidelines and regulations specify different wildlife survey areas for different species and for different survey purposes (baseline studies or annual monitoring). Those surveys included the mine permit area and surrounding perimeter ranging from 0.5 to 2.0 miles (depending on the purpose of the surveys). The larger survey perimeters for the mines' annual monitoring programs coincidentally encompassed all USFS administered lands within the general analysis areas for the North and South Porcupine tracts and the North Hilight Field tract, all but the southwestern-

most corner (roughly 15 percent) of the general analysis area for the South Hilight Field tract, and all but the southwestern quarter (roughly 25 percent) of the general analysis area for West Hilight Field tract.

Regular surveys conducted in and near USFS lands over the years included raptors, mountain plovers (*Charadrius montanus*), upland game birds, migratory bird species of management concern, lagomorphs (rabbits), and big game. Supplemental specific surveys for bald eagles, herptiles, waterfowl, fish, and other species were conducted periodically during baseline studies for the applicant mines and adjacent mines (i.e., Antelope Mine). Efforts included a variety of approved survey methods, such as fixed-wing aerial, remote observation via spotting scopes and binoculars, pedestrian, nocturnal spotlighting, belt transects, point counts, and trapping. All incidental sightings of those species were also recorded during each site visit, including notes on species, number of individuals, sex/age (when possible), habitat, and location. Specific details regarding survey methods and results from annual monitoring and baseline inventories for the Black Thunder, Jacobs Ranch and North Antelope Rochelle mines, dating back to the early 1980s, are provided in reports on file with the WDEQ-LQD and/or USFS, and thus are not provided in this document.

USFS typically assesses impacts to resources on its managed lands and, when applicable, adjacent lands that could also be impacted by the Proposed Action. For wildlife, the USFS is interested in knowing what resources and potential impacts occur within a 1- or 2-mile perimeter surrounding their lands, depending on the species. As discussed in Section 3.10 of this EIS, the wildlife survey areas for this analysis includes the LBA tracts' general analysis areas plus a surrounding perimeter that varies in extent depending on the species. Thunder Basin Coal Company (TBCC) conducted baseline investigations during 2006 and early 2007 specifically for the West Hilight Field LBA Tract with additional surveys targeting the North and South Hilight Field LBA Tracts in 2007 and 2008; Jacobs Ranch Coal Company (JRCC) conducted baseline investigations in 2007 and 2008 expressly for the West Jacobs Ranch LBA Tract; and Powder River Coal, Inc. (PRC) conducted baseline investigations during 2007 and early 2008 specifically for the North and South Porcupine LBA Tracts. These surveys covered the respective general analysis areas, and surveys for selected wildlife information such as raptor nest, Greater sage-grouse lek, and prairie dog colony locations covered the respective wildlife survey areas (2-mile perimeter surrounding the general analysis areas). Figures H-1 through H-5 depict the wildlife survey area and the USFS lands within the general analysis area for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts, respectively.

The entire list of Region 2 Sensitive Species was reviewed and every vertebrate species was considered for full evaluation. However, only those species that might potentially be affected directly or indirectly by implementation of the

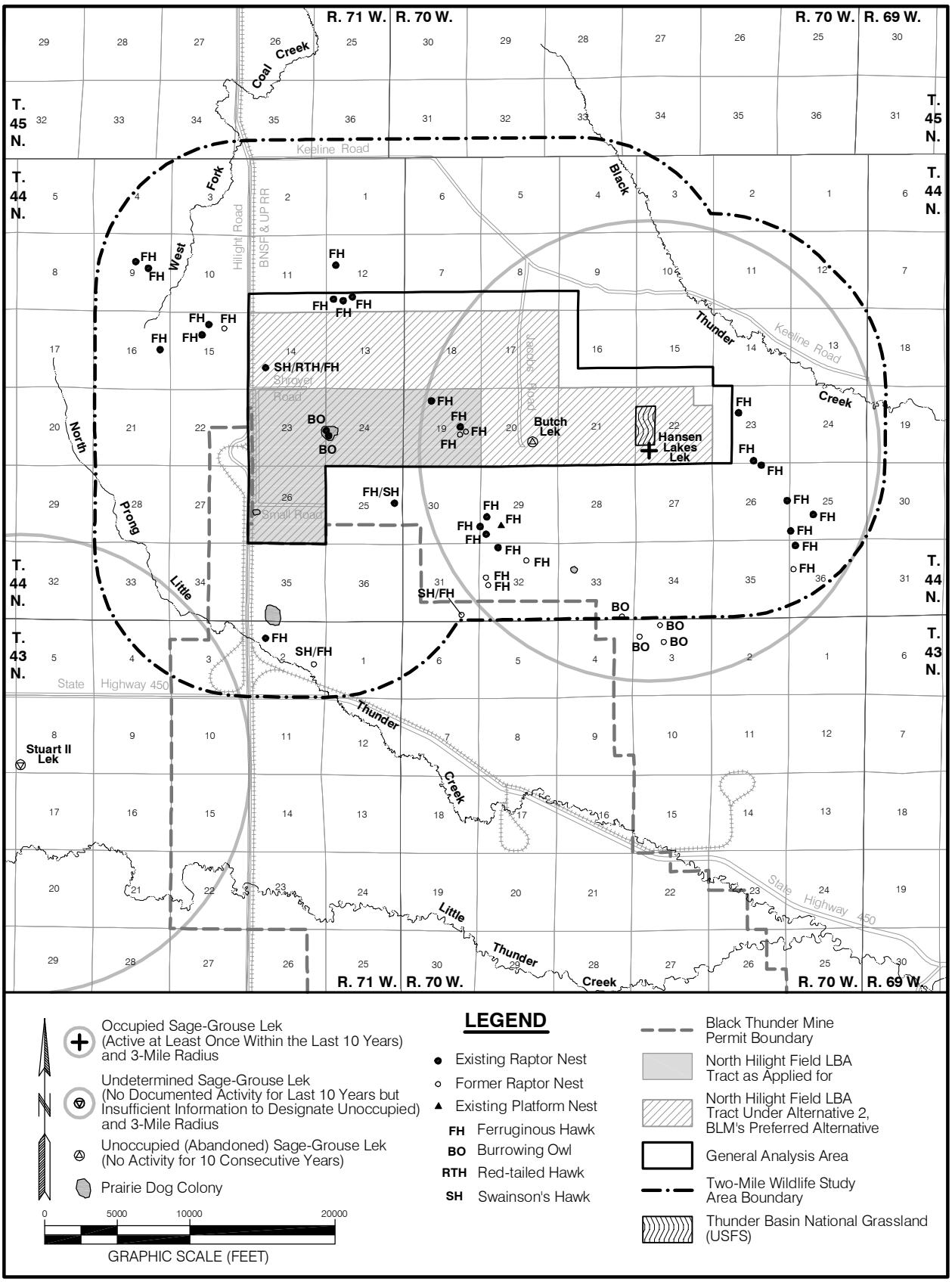

Figure H-1. USFS Region 2 Sensitive Wildlife Species Survey Area for the North Hilight Field LBA Tract.

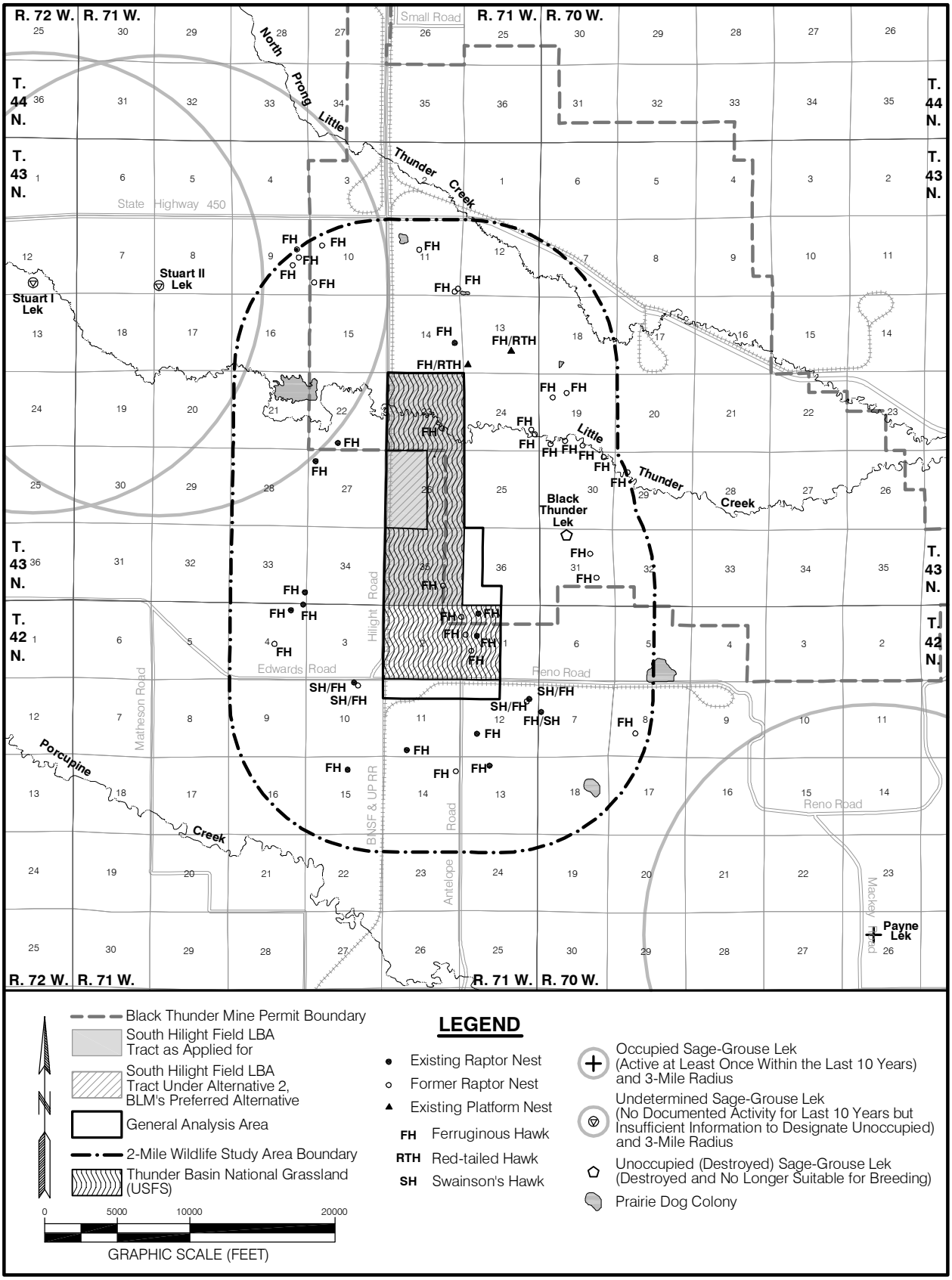

Figure H-2. USFS Region 2 Sensitive Wildlife Species Survey Area for the South Hilight Field LBA Tract.

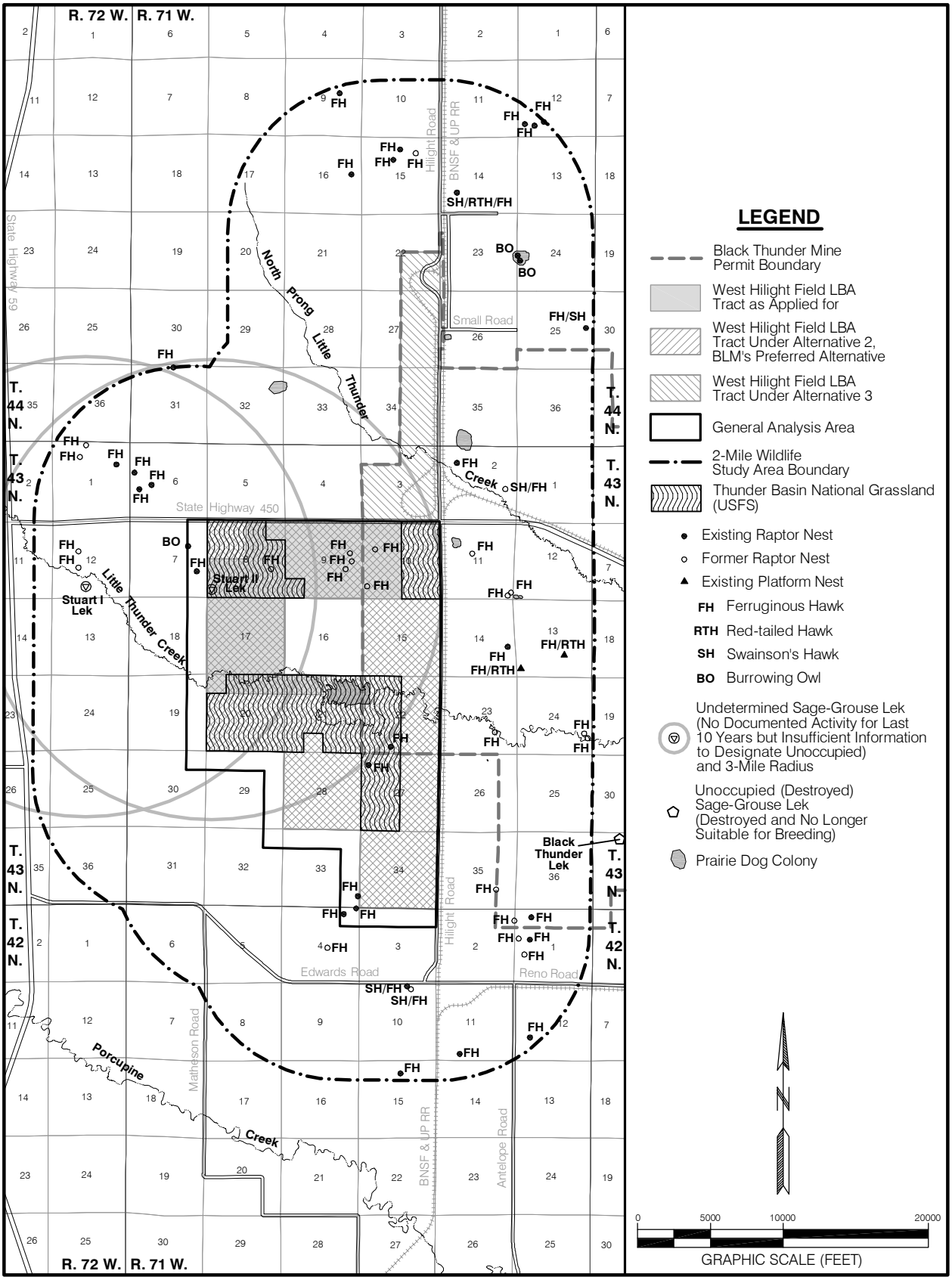

Figure H-3. USFS Region 2 Sensitive Wildlife Species Survey Area for the West Hilight Field LBA Tract.

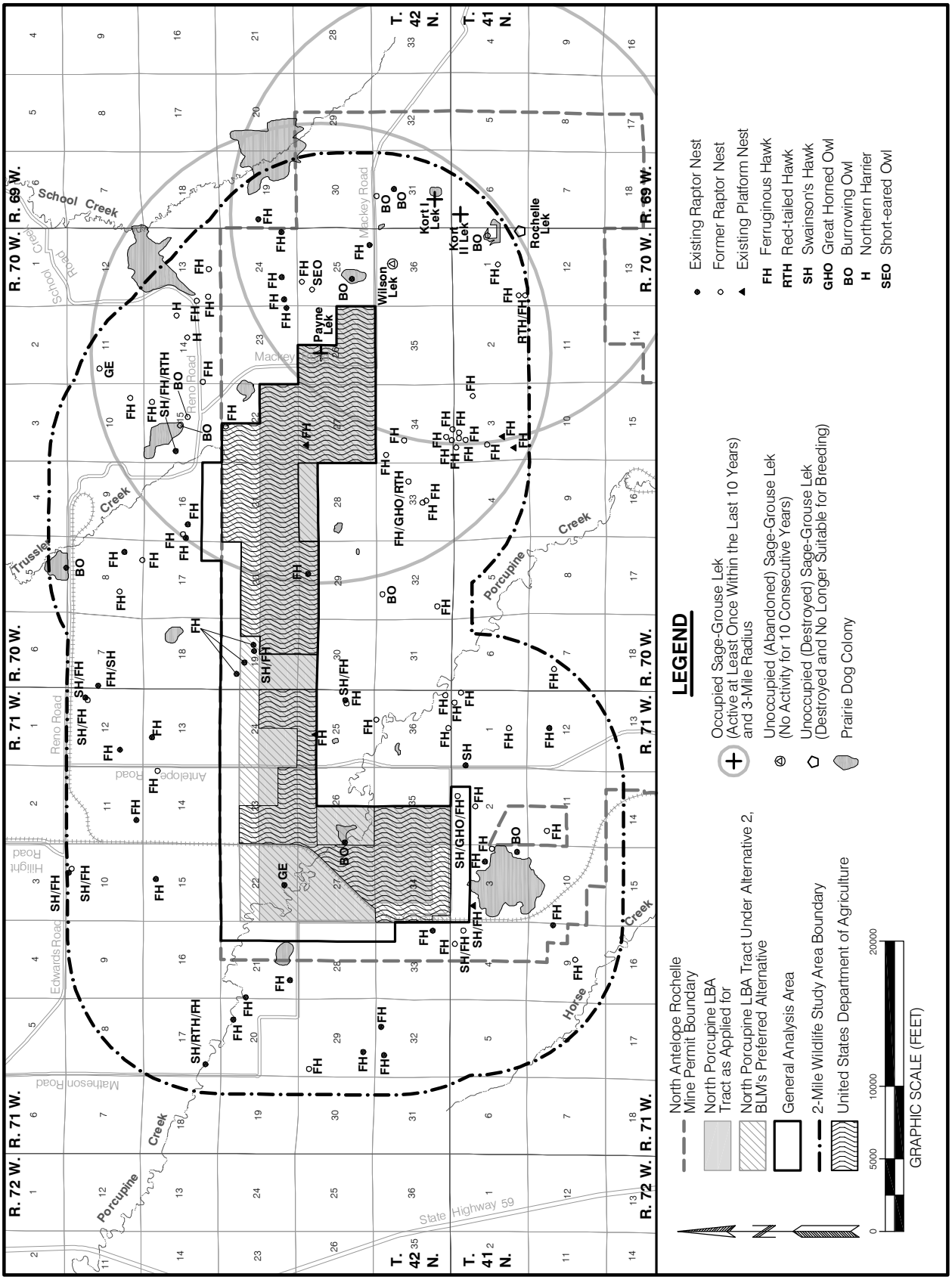

Figure H-4. USFS Region 2 Sensitive Wildlife Species Survey Area for the North Porcupine LBA Tract.

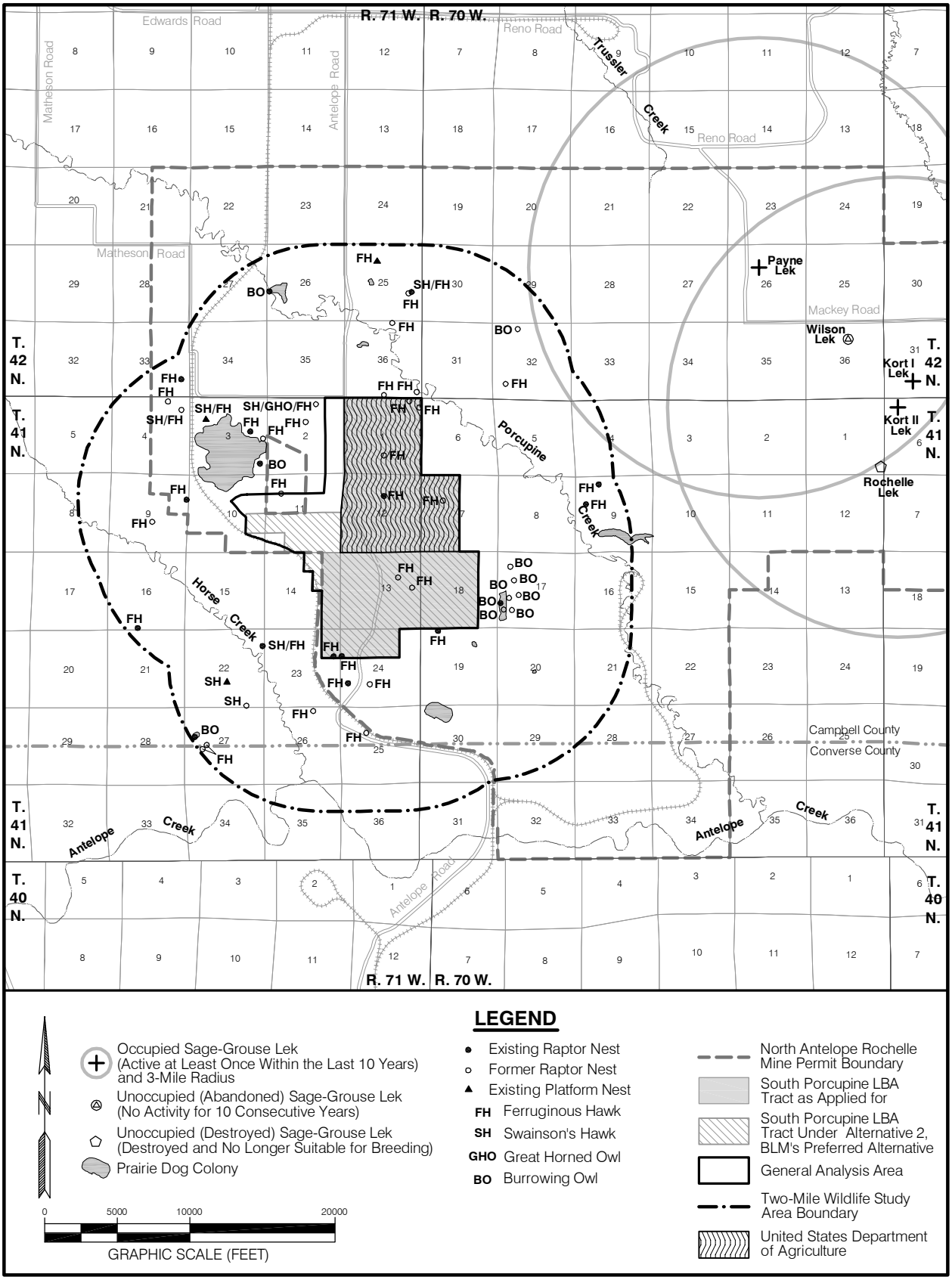

Figure H-5. USFS Region 2 Sensitive Wildlife Species Survey Area for the South Porcupine LBA Tract.

Proposed Actions or Alternatives on USFS lands were selected for evaluation (Table H-8). For example, if a vertebrate species was known to occur on or near USFS lands, or suitable but unoccupied habitat was present in that area and would be disturbed, then potential effects were evaluated. If suitable habitat was not present in the area, no further analysis was conducted.

Thirteen vertebrate species were identified that could potentially be affected by implementation of the Proposed Actions or Alternatives (Table H-8). Many other sensitive vertebrates and one invertebrate that had been documented elsewhere on the TBNG were not evaluated further because of a lack of suitable habitat on or near USFS lands, or because no such habitat would be physically disturbed or otherwise affected by implementation of the Proposed Actions or Alternatives.

Vegetation baseline inventories have been completed on each mine's current permit area in accordance with the current WDEQ/LQD mine permitting requirements. As a result, all or portions of the LBA tracts' general analysis areas were covered during various vegetation baseline inventories, as well as for prior EIS analyses. Vegetation assessments were completed for the balance of the tracts' general analysis areas in 2007 and 2008. There is no suitable habitat on USFS lands within the general analysis areas for 12 of the 17 plant species listed in Tables H-8 and H-9. All of the 17 plant species will be discussed here because potential habitat may be present on other portions of the general analysis areas even if suitable habitat is not present on the USFS lands.

The following discussions summarize the results of these surveys, including brief descriptions of the habitat and occurrence of each evaluated USFS Region 2 sensitive species and species of local concern, which are identified in Tables H-8 and H-9 as inhabiting or potentially inhabiting USFS lands within the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts. The general analysis area for the West Jacobs Ranch LBA Tract does not include any TBNG lands administered by the USFS. The potential direct and indirect environmental effects on the respective species as a result of leasing and mining the LBA tracts follow the habitat and occurrence descriptions. Cumulative impacts for all evaluated Region 2 Sensitive Species are discussed at the end of this biological evaluation.

H-3.2.1 Prairie moonwort (*Botrychium campestre*)

The prairie moonwort, a sensitive plant species, has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species was only recorded in Wyoming in a semi-shady mixed deciduous and ponderosa pine forest on sandy soils in the Black Hills. Prairie moonworts are known to exist in a variety of other habitats such as those underlain by Pierre shale, the Laramie Formation, calcareous

sedimentary rocks, calcareous soils underlain by limestone, sandy soils and loess prairie. These habitats are generally limited on the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas, with only some areas dominated by sandy soils present.

Existing Conditions

Prime habitats for the prairie moonwort are not present on the USFS lands within the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts. Sites with sandy soils are present on USFS lands and other portions of the general Wright analysis area, but these areas are rather sparsely vegetated and do not provide habitat preferred by this plant species. Prairie moonworts have not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species. The potential for loss of individuals or preferred habitats is very low.

H-3.2.2 Narrowleaf moonwort (*Botrychium lineare*)

The narrowleaf moonwort, a sensitive plant species, has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species has an affinity for riparian areas and is associated with spruce/fir forests, lodgepole pine forests, and forest meadows.

Existing Conditions

Habitats for the narrowleaf moonwort are not present on the USFS lands within the general Wright analysis area. Suitable riparian habitats or forest habitats are not present on these USFS lands within the general Wright analysis area. Few riparian sites associated with various ephemeral drainages are present on portions of the general Wright analysis area, and these sites do not appear to provide optimum habitat for this species. The narrowleaf moonwort has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species. The potential loss of individuals or preferred habitats is very low.

H-3.2.3 Leathery grapefern (*Botrychium multifidum* var. *coulteri*)

The leathery grapefern, a plant species of local concern, has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for meadows, wetlands, floodplains and other wet areas in open to forested habitats within forests.

Existing Conditions
Habitats for the leathery grapefern are not present on the USFS lands within the general Wright analysis area. Suitable riparian habitats or forest habitats are not present on these USFS lands within the general Wright analysis area. Few riparian sites associated with various ephemeral drainages are present on other portions of the general Wright analysis area, and these sites do not appear to provide optimum habitat for this species. The leathery grapefern has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *would have no impact* on the leathery grapefern. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.4 Foxtail sedge (*Carex alopecoidea*)

The foxtail sedge, a sensitive plant species, is a perennial plant species and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general

analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. The foxtail sedge generally has an affinity for wet meadows and willow-sedge communities along wet, shady creek bottoms and springs.

Existing Conditions

Habitats for the foxtail sedge are not present on the USFS lands within the general Wright analysis area. Suitable wet meadows or willow-sedge communities are not present on these USFS lands. Few riparian sites associated with various ephemeral drainages are present on other portions of the general Wright analysis area, and these sites do not appear to provide optimum habitat for this species. The foxtail sedge has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *should have no impact* on the foxtail sedge. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species. The potential for loss of individuals or preferred habitats is not expected.

H-3.2.5 Elliptic spikerush (*Eleocharis elliptica*)

The elliptic spikerush, a sensitive plant species, is a perennial and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for wetland areas created by seeps or springs but may also be found in temporarily flooded areas.

Existing Conditions

Habitats for the elliptic spikerush are not present on the USFS lands within the general Wright analysis area. Suitable wetland habitats are not present on these USFS lands. Few wetland sites associated with various ephemeral drainages and playas are present on portions of the general Wright analysis area, but these sites do not appear to provide optimum habitat for this species. The elliptic spikerush has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining

activities. However, due to lack of abundant suitable habitat the impacts to this species overall would be minimal.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide abundant habitat for this plant species so the potential loss of individuals or preferred habitats is low.

H-3.2.6 Hall's fescue (*Festuca hallii*)

The Hall's fescue, a sensitive plant species, is a tufted perennial grass and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for montane meadows, slopes and edges of open coniferous woods and meadows above 6,000 feet in Wyoming.

Existing Conditions

Habitats for the Hall's fescue are not present on the USFS lands within the general Wright analysis area. Suitable montane habitats above 6,000 feet are not present on these USFS lands within the general Wright analysis area, and the Hall's fescue has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *should have no impact* on the Hall's fescue. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species. The potential loss of individuals or preferred habitats is not expected.

H-3.2.7 Wood lily (*Lilium philadelphicum*)

The wood lily, a plant species of local concern, is a perennial herb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for woodland meadows and woodland grasslands.

Existing Conditions
Habitats for the wood lily are not present on the USFS lands within the general Wright analysis area. Suitable woodland meadow or grassland habitats are not present on these USFS lands within the general Wright analysis area, and the wood lily has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *should have no impact* on the wood lily. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.8 Largeflower triteleia (*Triteleia grandiflora*)

The largeflower triteleia, a sensitive plant species, is a perennial herb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for grassy areas in sagebrush at the edge of aspen and lodgepole pine forests and in pinon-juniper woodlands to pine forests and hills.

Existing Conditions
Habitats for the largeflower triteleia are not present on the USFS lands within the general Wright analysis area. Suitable grassy areas in sagebrush at the edge of aspen and lodgepole pine forests and pinon-juniper woodlands or pine forests and hills are not present on these USFS lands within the general Wright analysis area, and the largeflower triteleia has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *should have no impact* on the largeflower triteleia. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable

habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.9 Barr's milkvetch (*Astragalus barrii*)

The Barr's milkvetch, a sensitive plant species, is a matt-forming perennial forb that is known from numerous occurrences on the USFS lands within the TBNG. As more surveys are completed, new occurrences are reported. The Barr's milkvetch is found primarily on dry, sparsely-vegetated rocky prairie breaks, knolls, hillsides and ridges. Parent material is calcareous soft shale, siltstone or silty sandstone. Most populations appear to be stable, although populations may decline under drought conditions.

Existing Conditions

Astragalus barrii is a regional endemic plant of the plains in southwestern South Dakota, eastern Wyoming, southeastern Montana, and northwestern Nebraska. According to USFS, this plant species is known to occur in six counties in Wyoming, and there are eleven known occurrences of *A. barrii* in the USFS TBNG.

Suitable habitat for the Barr's milkvetch is present on the USFS lands within the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine LBA Tracts as well as other lands within the general Wright analysis area. Populations and individuals have not been documented in the general analysis areas for the North, South and West Hilight Field tracts, but have been identified in surrounding areas. A pedestrian survey of the North, South and West Hilight Field tracts' general analysis areas was conducted in April 2008, when the Barr's milkvetch is in bloom, and no individuals of this species were found. Surveys in 2005 within the general analysis areas for the North and South Porcupine tracts identified Barr's milkvetch populations, but no individuals were found on USFS lands. Barr's milkvetch has been collected and positively identified approximately 6 miles south of the general Wright analysis area, in Section 21 of T.40N., R.71W., based on specimens on file with the Rocky Mountain Herbarium in Laramie, Wyoming.

Indirect and Direct Impacts

If lands within the general analysis areas for the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts are leased and mined, potential habitat, individuals, and *A. barrii* populations could be lost due to surface disturbances caused by mining activities. If lands within the general analysis areas for the North Porcupine and South Porcupine LBA Tracts are leased and mined, potential habitat, individuals, and *A. barrii* populations would be lost due to surface disturbances caused by mining activities. These losses would most likely be permanent unless disturbed lands are reclaimed to habitats that would support this plant species.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing* because there are *Astragalus barrii* occurrences outside of the areas that would be affected by the Proposed Action or Alternative 2. The Rocky Mountain Herbarium records reveal this plant species is widespread in northeastern Wyoming, so the loss of individuals or populations from mining activities related to the Proposed Action or Alternative 2 would not result in the extirpation of this species.

H-3.2.10 Smooth goosefoot (*Chenopodium subglabrum*)

The smooth goosefoot, a plant species of local concern, is an annual forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for sand bars and sandy blowouts in riparian areas.

Existing Conditions

Habitats for the smooth goosefoot are not present on the USFS lands within the general Wright analysis area. Suitable riparian areas are not present on the USFS lands within the general Wright analysis area. A few riparian areas associated with various ephemeral drainages are present on portions of the general Wright analysis area, but these areas do not contain the required sand bar or sandy blowout habitats required for this plant species. The smooth goosefoot has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *should have no impact* on the smooth goosefoot. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.11 Flat-top goldentop (*Euthamia graminifolia*)

The flat-top goldentop, a plant species of local concern, is a rhizomatous perennial forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. In Wyoming, this species generally has an affinity for stony sandbars and

streambanks but may also be found on moist or drying sites along open streambanks or roadside ditches.

Existing Conditions

Habitats for the flat-top goldentop are not present on the USFS lands within the general Wright analysis area. Suitable wetland or streambank areas are not present on the USFS lands within the general Wright analysis area. Streambanks and a few wetland areas in association with various ephemeral drainages are present within portions of the general Wright analysis area, but these areas generally do not contain the typical habitats required for this plant species, but marginal habitats are present. The flat-top goldentop has not been recorded on the general Wright analysis areas or adjacent areas.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species so the potential loss of individuals or preferred habitats is low.

H-3.2.12 Rosy palafox (*Palafoxia rosea* var. *macrolepis*)

The rosy palafox, a plant species of local concern, is an annual forb that has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas but has been recorded on other lands within the TBNG. This plant species is suspected of occurring on other TBNG lands where suitable habitat is present. In Wyoming, this species generally has an affinity for sagebrush and mixed-grass prairie habitats on sandy soils.

Existing Conditions

Habitats utilized by the rosy palafox are present on the USFS lands within the general Wright analysis area and on other surrounding lands. Sagebrush and mixed-grass prairie plant communities are present on sandy soils in the general Wright analysis area. However, rosy palafox has not been recorded on these lands but is potentially present. This plant species has been documented southeast of the general Wright analysis area.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities. However, due to the presence of abundant habitat outside of the general analysis areas for the North Hilight Field, South Hilight Field, West

Hilight Field, North Porcupine and South Porcupine tracts, and the fact that this plant is abundant in other areas, the impacts to this species overall would be minimal.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do contain some suitable habitat for this plant species but the rosy palafox has not been documented. This species has been documented southeast of the general Wright analysis area and abundant habitat is present on other sites that would not be affected.

H-3.2.13 Lemonscent (*Pectis angustifolia*)

The lemonscent, a plant species of local concern, is an annual forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas but has been recorded on other lands within the TBNG. This plant species is suspected of occurring on other TBNG lands where suitable habitat is present. In Wyoming, this species generally has an affinity for gravel hills and scoria slopes. Lemonscent is also known to occur in low areas in sandy ravines and on sandbars.

Existing Conditions

Habitats utilized by lemonscent are present on the USFS lands within the general Wright analysis area and on other surrounding lands. However, lemonscent has not been recorded in the general Wright analysis area but could potentially be present. This plant species has been documented south of the general Wright analysis area.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities. However, due to the presence of abundant habitat outside of the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts, and the fact that this plant is abundant in other areas, the impacts to this species overall would be minimal.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do contain some suitable habitat for this plant species but the lemonscent has not been documented. This species has been documented south of the general Wright analysis area and abundant habitat is

present on other sites outside of the areas that would be affected by the Proposed Action or Alternative 2 for each LBA tract.

H-3.2.14 Larchleaf beardtongue (*Penstemon laricifolius* spp. *exifolius*)

The larchleaf beardtongue (penstemon), a plant species of local concern, is a perennial forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. In Wyoming, this species generally has an affinity for dry, rocky, gravelly or sandy slopes, ridgetops and upland flats with shallow soils. Most populations in Wyoming are found at elevations above 6,000 feet, but this species has been documented at lower elevations in the state.

Existing Conditions

Habitats utilized by larchleaf beardtongue are marginally present on the USFS lands within the general Wright analysis area. A few rocky, gravelly hill slopes and rough breaks provide potential habitat, but the larchleaf beardtongue has not been recorded on these lands. This plant species has not been documented near the general Wright analysis area but is potentially present.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities. However, due to the presence of abundant habitat outside of the general Wright analysis area and the fact that this plant is abundant in other areas, the impacts to this species overall would be minimal.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do contain marginal habitat for this plant species but the larchleaf beardtongue has not been documented. This species has been documented and is common in southern Wyoming and abundant habitat is present on other sites outside of the areas that would be affected by the Proposed Action or Alternative 2 for each LBA tract.

H-3.2.15 Wooly twinpod (*Physaria didymocarpa* var. *lanata*)

The wooly twinpod, a sensitive plant species, is a perennial forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. This plant species is suspected of occurring on other TBNG lands where suitable habitat is present. In Wyoming, this species generally has an affinity for dry redbed clay-shale slopes, limey-sandstone outcrops, roadcuts and other exposed rock-cliff substrates. Most

populations in Wyoming have been documented in the foothills of the Big Horn Mountains.

Existing Conditions

Habitats utilized by the wooly twinpod are marginally present on the USFS lands within the general Wright analysis area. A few sandstone outcrops and exposed rock-cliff substrates provide potential habitat, but the wooly twinpod has not been recorded on these lands. This plant species has not been documented near the general Wright analysis area but is potentially present.

Indirect and Direct Impacts

If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities. However, due to the presence of abundant habitat outside of the general Wright analysis area and the fact that this plant is abundant in other areas, the impacts to this species overall would be minimal.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do contain marginal habitat for this plant species but the wooly twinpod has not been documented. This species has been documented and is common in north-central Wyoming and abundant habitat is present on other sites outside of the areas that would be affected by the Proposed Action or Alternative 2 for each LBA tract.

H-3.2.16 Visher's buckwheat (*Eriogonum visheri*)

The Visher's buckwheat, a sensitive plant species, is an annual forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas but has been tentatively identified elsewhere within the TBNG. This plant species is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for gullied ridges and eroded badland hills. These sites generally consist of barren shale and clay outcrops with at least 50 percent bare soil, high salt content and shrink/swell clay soils. Typical habitat includes badland islands in grasslands.

Existing Conditions

Habitats for the Visher's buckwheat are not present on the USFS lands within the general Wright analysis area. A few areas of highly eroded gullies consisting of barren shale or clay outcrops may be found in portions of the general Wright analysis area, but these sites generally provided a greater vegetation cover than is needed to provide optimum habitat for this species. The Visher's buckwheat has not been recorded on the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *would have no impact* on the Visher's buckwheat. As indicated, the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide optimum suitable habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.17 Highbush-cranberry (*Viburnum opulus* var. *americanum*)

The highbush-cranberry, a sensitive plant species, is a perennial forb and has not been documented on USFS lands within the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine general analysis areas or within the TBNG. In Wyoming, this plant species is found within Crook County and is suspected of occurring on TBNG lands where suitable habitat is present. This species generally has an affinity for moist sites including wooded hillsides, thickets or low woodlands. The highbush-cranberry is found all across northern North America.

Existing Conditions
Habitats for the highbush-cranberry are not present on the USFS lands within the general Wright analysis area. Suitable moist, wooded habitats are not present on these USFS lands within the general Wright analysis area. The highbush-cranberry has not been recorded within the general Wright analysis area or adjacent areas.

Indirect and Direct Impacts
If present on areas to be disturbed by mining, individuals of this species would be lost when topsoil is removed or during disturbances caused by other mining activities.

Determination of Effect and Rationale
Implementation of the Proposed Action or Alternative 2 for each LBA tract *would have no impact* on the highbush-cranberry. As indicated, this species has not been documented in the general Wright analysis area and the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts do not provide suitable habitat for this plant species so the potential loss of individuals or preferred habitats is not expected.

H-3.2.18 Northern leopard frog (*Rana pipiens*)

Northern leopard frogs range from the Great Slave Lake and Hudson Bay, south to Kentucky and New Mexico (NatureServe 2007). This species is considered relatively common within Wyoming (Baxter and Stone 1980,

Cerovski et al. 2004). Northern leopard frogs require shallow, permanent, or semi-permanent standing water with at least some emergent vegetation for breeding (Wagner 1997). Conversely, they use deeper lakes or ponds with well-oxygenated water that does not freeze to the bottom as overwintering habitat (Wagner 1997). Leopard frogs must have good quality water to successfully reproduce, as degraded or turbid water has the potential to negatively affect development of eggs and tadpoles. Overcrowding and changes in water temperature and pH (5.5 or lower) can increase the incidence of disease and mortality (NatureServe 2007) in this species. Adult frogs feed upon a variety of insects and other invertebrates, tadpoles, snakes, and fish (Cerovski et al. 2004), while tadpoles feed primarily upon small invertebrates, plant tissue, and organic debris. Adults also forage within aquatic and upland habitats, whereas tadpoles are restricted to aquatic habitats. Although their overall range remains essentially undiminished in size, many populations are declining. Major factors affecting leopard frog populations are habitat loss in some portions of their range, habitat degradation, overexploitation, interactions with non-native species, climate change, disease, and other unknown causes (Wagner 1997).

Existing Conditions – North Hilight Field LBA Tract

The northern leopard frog has been observed in southern Campbell County, but has not officially been recognized as breeding there (Cerovski et al. 2004). Although formal anuran surveys were not required or conducted at the adjacent Black Thunder, Jacobs Ranch, or North Antelope Rochelle mines, annual monitoring efforts for other species conducted in overlapping survey areas from 1983 through 2007 have not revealed the presence of northern leopard frogs or anuran egg masses on USFS lands or elsewhere within the general analysis area for the North Hilight Field LBA Tract. Those surveys occurred during all seasons, with biologists watching and listening for northern leopard frogs and other herptiles while conducting all other surveys throughout the area. It is unlikely that northern leopard frogs would have remained undetected during multiple surveys conducted during that long-term period if they were present in the area. Results from annual wildlife monitoring and baseline studies for the three mines are on file with, and available from, the WDEQ/LQD in Sheridan or Cheyenne, Wyoming and USFS Douglas Ranger District; those reports also include detailed descriptions of survey areas (including maps), methods, and dates for each year.

Habitat conditions on USFS and non-USFS lands within the tract's general analysis area are classified as unsuitable, as there are no available permanent or semi-permanent water sources. Water levels in drainages are typically too temporary and/or shallow to support tadpoles until metamorphosis, or allow frogs to successfully overwinter, respectively. All drainages throughout the tract's general analysis area are ephemeral in nature and only carry water during or immediately following high intensity precipitation events, resulting in low quality or unsuitable habitat conditions for this frog species. The general

lack of emergent vegetation near temporary water bodies limits their value to northern leopard frogs.

Existing Conditions – South Hilight Field LBA Tract

The northern leopard frog has been observed in southern Campbell County, but has not officially been recognized as breeding there (Cerovski et al. 2004). Although formal anuran surveys were not required or conducted at the adjacent Black Thunder, Jacobs Ranch, or North Antelope Rochelle mines, annual monitoring efforts for other species conducted in overlapping survey areas from 1983 through 2007 have not revealed the presence of northern leopard frogs or anuran egg masses on USFS lands or elsewhere within the general analysis area for the South Hilight Field LBA Tract. Those surveys occurred during all seasons, with biologists watching and listening for northern leopard frogs and other herptiles while conducting all other surveys throughout the area. It is unlikely that northern leopard frogs would have remained undetected during multiple surveys conducted during that long-term period if they were present in the area. Results from annual wildlife monitoring and baseline studies for the three mines are on file with, and available from, the WDEQ/LQD in Sheridan or Cheyenne, Wyoming and USFS Douglas Ranger District; those reports also include detailed descriptions of survey areas (including maps), methods, and dates for each year.

Habitat conditions on USFS and non-USFS lands within the tract's general analysis area are classified as poor potential to unsuitable, as there are only limited seasonal water sources available. No permanent or semi-permanent waters are present anywhere on those USFS lands. Little Thunder Creek passes through USFS lands within the South Hilight Field tract. In its natural state, this ephemeral stream is typically dry by mid to late summer, and without flow to maintain open water, any pools persisting until winter freeze solid, thus limiting overwintering habitat for this species. Like Little Thunder Creek, all other drainages throughout the tract's general analysis area are ephemeral in nature and only carry water during or immediately following high intensity precipitation events, resulting in low quality or unsuitable habitat conditions for this frog species. Water discharged from CBNG wells has enhanced the water supply within some portions of Little Thunder Creek and its tributaries, which has increased potential habitat for some aquatic and semi-aquatic species. However, those enhanced areas are still relatively limited and/or isolated in nature. Water levels in drainages are typically too temporary and/or shallow to support tadpoles until metamorphosis, or allow frogs to successfully overwinter, respectively. The general lack of emergent vegetation near temporary water bodies limits their value to northern leopard frogs.

Existing Conditions – West Hilight Field LBA Tract

The northern leopard frog has been observed in southern Campbell County, but has not officially been recognized as breeding there (Cerovski et al. 2004). Although formal anuran surveys were not required or conducted at the

adjacent Black Thunder, Jacobs Ranch, or North Antelope Rochelle mines, annual monitoring efforts for other species conducted in overlapping survey areas from 1983 through 2007 have not revealed the presence of northern leopard frogs or anuran egg masses on USFS lands or elsewhere within the general analysis area for the West Hilight Field LBA Tract. Those surveys occurred during all seasons, with biologists watching and listening for northern leopard frogs and other herptiles while conducting all other surveys throughout the area. It is unlikely that northern leopard frogs would have remained undetected during multiple surveys conducted during that long-term period if they were present in the area. Results from annual wildlife monitoring and baseline studies for the three mines are on file with, and available from, the WDEQ/LQD in Sheridan or Cheyenne, Wyoming and USFS Douglas Ranger District; those reports also include detailed descriptions of survey areas (including maps), methods, and dates for each year.

Habitat conditions on USFS and non-USFS lands within the tract's general analysis area are classified as poor potential to unsuitable, as there are only limited seasonal water sources available. No permanent or semi-permanent waters are present anywhere on those USFS lands. Little Thunder Creek passes through USFS lands within the West Hilight Field tract. In its natural state, this ephemeral stream is typically dry by mid to late summer, and without flow to maintain open water, any pools persisting until winter freeze solid, thus limiting overwintering habitat for this species. Like Little Thunder Creek, all other drainages throughout the tract's general analysis area are ephemeral in nature and only carry water during or immediately following high intensity precipitation events, resulting in low quality or unsuitable habitat conditions for this frog species. Water discharged from CBNG wells has enhanced the water supply within some portions of Little Thunder Creek and its tributaries, which has increased potential habitat for some aquatic and semi-aquatic species. However, those enhanced areas are still relatively limited and/or isolated in nature. A portion of Little Thunder Creek on USFS lands in the W½ Section 22, T.43N., R.71W. (Little Thunder Reservoir) has been dammed to retain water for at least part of each year. Despite that occasional increased water supply, the reservoir often lacks the emergent vegetation that is important for breeding and foraging leopard frogs. Water levels in drainages are typically too temporary and/or shallow to support tadpoles until metamorphosis, or allow frogs to successfully overwinter, respectively. The general lack of emergent vegetation near temporary water bodies limits their value to northern leopard frogs.

<u>Existing Conditions – North Porcupine LBA Tract</u>

The northern leopard frog has been observed in southern Campbell County, but has not officially been recognized as breeding there (Cerovski et al. 2004). No suitable habitat is present on USFS lands within the general analysis area for the North Porcupine LBA Tract. Porcupine Creek crosses a narrow band (approximately 1,500 feet) of USFS lands in the western portion of the tract's general analysis area (Figure H-4), but that small portion of the creek does not

provide sufficient, persistent water quantities or quality to support northern leopard frogs; the same is true of the stream channel immediately upstream and downstream of USFS lands in that area. No other persistently flowing streams or persistent reservoirs are present on USFS lands within the North Porcupine tract's general analysis area.

Habitat conditions for northern leopard frogs vary considerably between the overall general analysis area for the North Porcupine LBA Tract and the USFS lands within that larger area. The tract's general analysis area includes portions of Porcupine Creek and some of its ephemeral tributaries that occasionally retain small pools of water during spring and early summer. Within the general analysis area for the North Porcupine LBA Tract there are an estimated 19.7 acres of jurisdictional wetlands and other waters of the U.S. (OWUS). Of those 25.8 acres, there are approximately 9.3 acres of riverine wetlands, approximately 0.9 acres of stockpond wetlands, approximately 0.9 acres of stockpond open water OWUS, and approximately 8.6 acres of ephemeral stream channel OWUS. There are also approximately 4.9 wetland acres and 1.2 open water acres of non-jurisdictional playa/depressional features. The vegetated wetland areas consist primarily of palustrine emergent herbaceous wet meadow or marsh and palustrine aquatic beds located along ephemeral stream channels and around in-channel stock reservoirs. Without surface discharge of groundwater associated with CBNG development in the area, no water would be present in these ephemeral streams except in response to precipitation events and snow melt. Flows to maintain open water are therefore inconsistent and these streams are often dry by mid- to late summer; without flow to maintain open water, any pools persisting until winter freeze solid, which limits overwintering habitat for this species. Therefore, none of the physical characteristics considered as optimum for the various life stages of this species are present on the USFS lands throughout this tract's general analysis area, and no leopard frogs or anuran egg masses have been documented on those lands during more than 25 years of annual monitoring efforts. No northern leopard frogs were ever recorded in the general analysis area during overlapping annual monitoring efforts for other species conducted from 1984 through 2007. Results from annual wildlife monitoring and baseline studies for all adjacent mines are on file with, and available from, the WDEQ/LQD in Sheridan or Cheyenne, Wyoming and the USFS Douglas Ranger District Office in Douglas, Wyoming. Those reports also include detailed descriptions of survey areas (including maps), methods, and dates for each year.

<u>Existing Conditions – South Porcupine LBA Tract</u>

The northern leopard frog has been observed in southern Campbell County, but has not officially been recognized as breeding there (Cerovski et al. 2004). No suitable habitat is present on USFS lands within the general analysis area for the South Porcupine LBA Tract. Prior to CBNG development in this area, no persistent standing water was present within the South Porcupine tract's general analysis area, including all USFS surface lands in that area (Figure H-

5). Water sources on those lands are limited to an ephemeral tributary of Porcupine Creek (Mike's Draw), which flows in response to precipitation events such as rain storms and excessive snow melt. However, surface discharge of groundwater associated with CBNG development within the tract's general analysis area, which is a relatively recent phenomenon, has resulted in generally wetter conditions within the stream's channel throughout the year. Within the tract's entire general analysis area, there are an estimated 12.3 acres of jurisdictional wetlands and other waters of the U.S. (OWUS). Of those 12.3 acres, there are approximately 6.8 acres of riverine wetlands, approximately 0.4 acres of stockpond wetlands, approximately 0.2 acres of stockpond open water OWUS, and approximately 4.9 acres of ephemeral stream channel OWUS, all of which are present along Mike's Draw.. The vegetated wetland areas consist primarily of palustrine emergent herbaceous wet meadow or marsh along the ephemeral stream channel. Without surface discharge of groundwater associated with CBNG development in the area, no water would be present in Mike's Draw except in response to precipitation events and snow melt. Flows to maintain open water are therefore considered inconsistent, which limits overwintering habitat for this species. Therefore, none of the physical characteristics considered as optimum for the various life stages of this species are present on the USFS lands throughout this tract's general analysis area, and no leopard frogs or anuran egg masses have been documented on those lands during more than 25 years of annual monitoring efforts. No northern leopard frogs were ever recorded in the general analysis area during overlapping annual monitoring efforts for other species conducted from 1984 through 2007. Results from annual wildlife monitoring and baseline studies for all adjacent mines are on file with, and available from, the WDEQ/LQD in Sheridan or Cheyenne, Wyoming and the USFS Douglas Ranger District Office in Douglas, Wyoming. Those reports also include detailed descriptions of survey areas (including maps), methods, and dates for each year.

<u>Direct and Indirect Effects – North, South and West Hilight Field LBA Tracts</u>
Wetland and aquatic habitats for northern leopard frogs are considered very poor to unsuitable on USFS lands and elsewhere in the general analysis areas for the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts, as described above. Furthermore, no frog sightings have been recorded on USFS lands during baseline surveys or annual monitoring completed between 1983 and 2007. Consequently, northern leopard frogs and their aquatic and terrestrial habitats are not expected to be impacted if the USFS lands in these LBA tracts were leased. In the unlikely event that this species is present in the future, direct loss of, or injury to, foraging and dispersing frogs could result from encounters with mine vehicles or heavy equipment during topsoil stripping or other surface disturbance, although such risks are minimal due to the lack of frog sightings to date.

It is possible that existing reservoirs and ponds (natural and those enhanced by CBNG discharge water), and those created for flood control, sedimentation,

water storage purposes, or wetland mitigation measures could provide suitable foraging or breeding habitat for northern leopard frogs in the future. However, most artificial water structures would still be limited to relatively shallow, seasonal waters with little emergent vegetation that would not provide for the year-round habitat needs of this frog species. Should those efforts result in improved aquatic habitats, adult frogs, tadpoles, and/or egg masses present in the area could be injured or killed during activities associated with additional construction of diversion dikes or associated channels, or the dewatering of potential habitats downstream of a dike. Under those limited circumstances, potential impacts could include loss of individuals and foraging habitat, increased predation, and changes in stream morphology and hydrology. Standard mining procedures such as the use of silt barriers across affected stream channels and other similar efforts would minimize any negative impacts that might result from mine-related operations. Likewise, adherence to the Thunder Basin National Grassland Plan Standards and Guidelines (USFS 2002) pertaining to water and wetlands would ensure that leopard frogs and other aquatic organisms present on USFS lands would not be negatively affected by increased sedimentation, degraded water chemistry, or otherwise damaged aquatic habitats.

Direct and Indirect Effects – North and South Porcupine LBA Tracts

Wetland and aquatic habitats for northern leopard frogs are considered unsuitable to poor on USFS lands and elsewhere in the North and South Porcupine tracts' general analysis areas, as described above. Furthermore, no frog sightings have been recorded on USFS lands during baseline surveys or annual monitoring completed between 1984 and 2007. Consequently, northern leopard frogs and their aquatic and terrestrial habitats are not expected to be impacted if the USFS lands in the North and South Porcupine LBA Tracts are leased and mined.

In the unlikely event that this species is present in the North and South Porcupine tracts' general analysis areas in the future, direct loss of, or injury to, foraging and dispersing frogs could result from encounters with mine vehicles or heavy equipment near Porcupine Creek during topsoil stripping or other surface disturbance. If the South Porcupine tract is leased and proposed for mining by PRC, the North Antelope Rochelle Mine does not presently intend to mine through Mike's Draw and the potential habitat for this species would not be disturbed under the Proposed Action or Alternative 2.

It is possible that existing reservoirs and ponds (natural and those enhanced by CBNG discharge waters), and those created for flood control, sedimentation, water storage purposes, or wetland mitigation measures could provide suitable foraging or breeding habitat for northern leopard frogs in the future. However, most artificial water structures would still be limited to relatively shallow, seasonal waters with little emergent vegetation that would not provide for the year-round habitat needs of this frog species. Should those efforts result in improved aquatic habitats, adult frogs, tadpoles, and/or egg masses present in

the area could be injured or killed during activities associated with additional construction of diversion dikes or associated channels, or the dewatering of potential habitats downstream of a dike. Under those limited circumstances, potential impacts could include loss of individuals and foraging habitat, increased predation, and changes in stream morphology and hydrology. Standard mining procedures, such as the use of silt barriers across affected stream channels and other similar efforts, would minimize any negative impacts that might result from mine-related operations. Likewise, adherence to the TBNG Plan Standards and Guidelines (USFS 2002) pertaining to water and wetlands would ensure that leopard frogs and other aquatic organisms present on USFS lands would not be negatively affected by increased sedimentation, degraded water chemistry, or otherwise damaged aquatic habitats.

Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, USFS lands and adjacent non-federal lands within the North, South and West Hilight Field general analysis areas do not contain suitable habitat for northern leopard frogs. Water sources in the drainages in those areas are too temporary and shallow to support tadpoles until metamorphosis, or to allow frogs to successfully overwinter. If present, individual adult leopard frogs may be incidentally killed by vehicles or equipment. Habitat may be enhanced or created during certain mine operations, but water flow and depth associated with existing structures at the adjacent mines have not resulted in adequate conditions to support the life cycle needs of this species, and they are not expected to create those conditions anywhere in these three LBA tracts. As no northern leopard frogs have ever been documented on USFS lands within the overall general analysis areas for the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts, potential effects are expected to be negligible, if they occur at all. Furthermore, northern leopard frogs have been documented at other sites outside of the tracts' general analysis areas that will not be affected by coal leasing actions.

Determination of Effect and Rationale – North and South Porcupine LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As indicated, USFS lands and adjacent non-federal lands within the North and South Porcupine tracts' general analysis areas do not currently contain suitable habitat for northern leopard frogs. Water sources in the drainages in those areas are too temporary and shallow to support tadpoles until metamorphosis, or to allow frogs to successfully overwinter. If present, individual adult leopard frogs may be incidentally killed by vehicles or equipment. Habitat may be enhanced or created during certain mine operations, but water flow and depth associated with existing structures at the adjacent North Antelope Rochelle Mine has not resulted in adequate conditions

to support the life cycle needs of this species, and they are not expected to create those conditions anywhere in these two LBA tracts. As no northern leopard frogs have ever been documented on USFS lands within the overall general analysis areas for the North Porcupine and South Porcupine LBA Tracts, potential effects are expected to be negligible, if they occur at all. Furthermore, northern leopard frogs have been documented at other sites outside of the tract's general analysis area that will not be affected by coal leasing actions.

H-3.2.19 Black-tailed prairie dog (*Cynomys ludovicianus*)

The black-tailed prairie dog was removed from the USFWS federal listing process in 2004. The agency ruled that listing this species may be warranted, but was precluded by higher priority considerations. Consequently, the black-tailed prairie dog is no longer considered a candidate species under the Endangered Species Act (ESA).

Black-tailed prairie dogs historically ranged throughout the Great Plains in short-grass and mixed-grass prairies. This species is also a common resident in the short- and mid-grass habitats of eastern Wyoming (Cerovski et al. 2004). The TBNG, which includes USFS lands in the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine LBA Tracts, harbors one of the seven major colony complexes remaining in North America. Black-tailed prairie dogs are highly social, diurnal burrowing rodents that typically feed on grasses and forbs. Prairie dogs form colonies that are the main unit of a prairie dog population. This species has the ability to rapidly expand its distribution and population if not limited by pest control practices or disease, and will readily spread into recently disturbed areas. Many species such as the black-footed ferret, mountain plover, burrowing owl, and swift fox are dependent on prairie dogs during a portion of their life cycle. Black-tailed prairie dog occupied range and abundance has declined dramatically, and continues to exhibit a slow decline (NatureServe 2007). Major factors contributing to the decline include disease (sylvatic plague), urbanization, habitat conversion, and control efforts.

Existing Conditions – North Hilight Field LBA Tract

No prairie dog colonies were present on USFS lands within the North Hilight Field LBA Tract general analysis area or its 2-mile perimeter in 2007. Four prairie dog colonies (approximately 53.8 total acres) were found on non-federal surface in the wildlife survey area for the North Hilight Field tract (Figure H-1). Of which, two colonies occurred within the general analysis area for the tract and are approximately 3.4 and 19.5 acres in size. The other two colonies were in the surrounding 2-mile perimeter, and are about 3.7 and 27.2 acres in size.

None of these four colonies meet the 80-acre minimum for black-footed ferret habitat (USFWS 1989). However, the focus area for ferret reintroduction efforts is outside the coal mine region of the PRB of northeast Wyoming (refer to Management Area 3.63) (USFS 2002, Grenier 2003). That coal region includes

all USFS and surrounding lands within the general analysis area for the North Hilight Field LBA Tract. Additionally, some prairie dog colonies in that coal region were recently infested with the plague, while others are currently exposed to year-round disturbance associated with conventional oil and gas, CBNG, and coal (including open pits) resources, as well as seasonal recreational shooting and vehicular travel.

Existing Conditions – South Hilight Field LBA Tract

A total of seven prairie dog colonies (approximately 177.2 total acres) were found within 2 miles of the general analysis area for the South Hilight Field LBA Tract in 2007, four of which were present on USFS lands. One colony (approximately 0.1 acre in size) on USFS lands was in the general analysis area itself, while the other three colonies on USFS lands were in the surrounding 2-mile perimeter, and ranged in size from 7.7 to 89.1 acres, for a total of approximately 118 acres. Three additional prairie dog colonies were recorded on non-federal surface within or overlapping the 2-mile wildlife survey area (Figure H-2) in 2007, all three of which were outside of the tract's general analysis area. The total area for those three colonies was approximately 59 non-contiguous acres, and the sizes range from about 2 to 54 acres.

Only the 89.1-acre colony meets the 80-acre minimum for black-footed ferret habitat (USFWS 1989). As noted above, that colony is not on USFS lands nor is it within the general analysis area for the South Hilight Field LBA Tract. However, the focus area for ferret reintroduction efforts is outside the coal mine region of the PRB of northeast Wyoming (refer to Management Area 3.63) (USFS 2002, Grenier 2003). That coal region includes all USFS and surrounding lands within the general analysis area for the South Hilight Field LBA Tract. Additionally, some prairie dog colonies in that coal region were recently infested with the plague, while others are currently exposed to year-round disturbance associated with conventional oil and gas, CBNG, and coal (including open pits) resources, as well as seasonal recreational shooting and vehicular travel.

Existing Conditions – West Hilight Field LBA Tract

A total of eight prairie dog colonies (approximately 167.5 total acres) were found within the wildlife survey area for the West Hilight Field LBA Tract in 2007, three of which were present on USFS lands. The West Hilight Field wildlife survey area for this tract includes lands added by the BLM under Alternative 3 and the surrounding 2-mile perimeter. One colony (approximately 89.1 acres in size) on USFS lands was in the general analysis area itself, while the other two colonies on USFS lands were in the surrounding 2-mile perimeter, and ranged from less than 1 acre to about 7 acres in size, for a total of approximately 96 acres. Five additional prairie dog colonies were recorded on non-federal surface within or overlapping the 2-mile wildlife survey area (Figure H-3) in 2007, all five of which were outside of the tract's general analysis area. No colonies were present on adjacent lands within Alternative 3. The total area for those five colonies was approximately 63 non-contiguous acres, and the sizes range from about 2.6 to 27.2 acres.

Only the 89.1-acre colony meets the 80-acre minimum for black-footed ferret habitat (USFWS 1989). As noted above, that colony is on USFS lands and is also within the general analysis area for the West Hilight Field LBA Tract. However, the focus area for ferret reintroduction efforts is outside the coal mine region of the PRB of northeast Wyoming (refer to Management Area 3.63) (USFS 2002, Grenier 2003). That coal region includes all USFS and surrounding lands within the general analysis area for the West Hilight Field LBA Tract. Additionally, some prairie dog colonies in that coal region were recently infested with the plague, while others are currently exposed to year-round disturbance associated with conventional oil and gas, CBNG, and coal (including open pits) resources, as well as seasonal recreational shooting and vehicular travel.

Existing Conditions – North Porcupine LBA Tract

Surveys have been conducted to locate prairie dog colonies within the 2-mile wildlife survey area surrounding the general analysis area for North Porcupine LBA Tract (Figure H-4). No prairie dog colonies were present on USFS lands within the North Porcupine tract's general analysis area in 2007. Seventeen prairie dog colonies totaling approximately 1,211.4 non-contiguous acres were present within or overlapped the 2-mile wildlife survey area surrounding the North Porcupine tract's general analysis area in 2007 (Figure H-4). Only one colony (approximately 18.6 acres in size) was within the general analysis area itself. The remaining 16 colonies ranged from 1.5 to 345.3 acres in size.

The entire coal mine region of the PRB of northeast Wyoming, including all USFS and surrounding lands within the general analysis area for the South Porcupine LBA Tract, is beyond the focus area for ferret reintroduction efforts on the TBNG and in the general region (refer to Management Area 3.63-USFS 2002, Grenier 2003). Additionally, some prairie dog colonies in that region are currently experiencing development associated with conventional oil and gas, CBNG, and coal (including open pits) resources. Year-round human activity and disturbance are already present in a few locations.

Existing Conditions – South Porcupine LBA Tract

Surveys have been conducted to locate prairie dog colonies within the 2-mile wildlife survey area surrounding the general analysis area for South Porcupine LBA Tract (Figure H-5). No prairie dog colonies were present within the general analysis area for the tract in 2007. Ten prairie dog colonies totaling approximately 476.3 non-contiguous acres were present within or overlapped the 2-mile wildlife survey area surrounding the South Porcupine tract's general analysis area in 2007 (Figure H-5). The largest colony was approximately 345.3 acres in size; this colony is within both North and South Porcupine tracts' wildlife survey areas. The remaining nine colonies were all less than 40 acres in size.

The entire coal mine region of the PRB of northeast Wyoming, including all USFS and surrounding lands within the general analysis area for the South Porcupine LBA Tract, is beyond the focus area for ferret reintroduction efforts

on the TBNG and in the general region (refer to Management Area 3.63-USFS 2002, Grenier 2003). Additionally, some prairie dog colonies in that region are currently experiencing development associated with conventional oil and gas, CBNG, and coal (including open pits) resources. Year-round human activity and disturbance are already present in a few locations.

Direct and Indirect Effects – North, South and West Hilight Field LBA Tracts

The current mining plans for the Black Thunder and Jacobs Ranch mines do not project any new surface disturbance in the two prairie dog colonies located within the general analysis area for the North Hilight Field LBA Tract. Nevertheless, those two colonies would be affected by the proposed leasing action at some point in time. As stated above, neither colony is located on USFS lands. Such impacts could have immediate results on prairie dogs if an occupied colony is suddenly subjected to the effects of a soil salvage operation, or is otherwise impacted in a short timeframe that precludes the dispersal of individuals prior to surface disturbance. However, as those activities typically occur incrementally across various portions of future mining areas, some individuals could disperse to undisturbed portions of the affected colony, or create one or more new colonies within the area.

The current mining plans for the Black Thunder Mine do not project any new surface disturbance in the one prairie dog colony that is located within the general analysis area for the South Hilight Field LBA Tract. Nevertheless, that colony would be affected by the proposed leasing action at some point in time. As stated above, that very small colony (approximately 0.1 acre in size) is located on USFS lands. Such impacts could have immediate results on prairie dogs if an occupied colony is suddenly subjected to the effects of a soil salvage operation, or is otherwise impacted in a short timeframe that precludes the dispersal of individuals prior to surface disturbance. However, as those activities typically occur incrementally across various portions of future mining areas, some individuals could disperse to undisturbed portions of the affected colony, or create one or more new colonies within the area.

The current mining plans for the Black Thunder Mine do not project any new surface disturbance in the one prairie dog colony that is located within the general analysis area for the West Hilight Field LBA Tract. Nevertheless, that colony would be affected by the proposed leasing action at some point in time. As stated above, that colony (89.1 acres in size) is located on USFS lands. Such impacts could have immediate results on prairie dogs if an occupied colony is suddenly subjected to the effects of a soil salvage operation, or is otherwise impacted in a short timeframe that precludes the dispersal of individuals prior to surface disturbance. However, as those activities typically occur incrementally across various portions of future mining areas, some individuals could disperse to undisturbed portions of the affected colony, or create one or more new colonies within the area.

Smaller-scale disturbances associated with both the mining and CBNG industries can also impact prairie dog colonies and surrounding vegetation through fragmentation or loss of foraging and burrowing habitat. Linear disturbances associated with mining infrastructure, such as roads, power lines, fences, and pipelines will occur within narrow corridors over relatively short distances, and would be completed within shorter timeframes than the advancement of a surface mine pit. However, such disturbances would still pose some level of risks due to vehicular collisions or by enhancing habitat for mammalian and avian species that prey on prairie dogs.

Some linear impacts could be minimized or mitigated through the consolidation of roads and electric utilities within common corridors, applying perch deterrents on overhead power poles, and reseeding pipeline disturbances quickly with appropriate seed mixes for the region. Minor surface disturbance near existing colonies would provide recently upturned soils that could facilitate the expansion of the existing colonies or the establishment of new ones, as prairie dogs will readily move into recently disturbed areas. Post-mining reclamation could have similar potential benefits; prairie dogs have already demonstrated their ability to inhabit reclaimed lands at the nearby Antelope Mine (BLM 2008).

All USFS Standards and Guidelines applicable to black-tailed prairie dogs outlined in the TBNG Plan (USFS 2002, page 1-20) would be implemented. To reduce risks and habitat loss for prairie dogs and other wildlife species closely associated with prairie dog colonies, new roads will be aligned outside colony boundaries where possible. If it is necessary to place a new road within a prairie dog colony, the amount of road in the colony will be minimized to the extent that soil, drainage, topographical and other physical factors will allow.

Direct and Indirect Effects – North and South Porcupine LBA Tracts

The North Porcupine LBA tract and its general analysis area are almost entirely encompassed by the existing North Antelope Rochelle Mine permit area; therefore, it is possible that surface disturbance associated with coal removal from the mine's current leases could occur on the tract regardless of whether or not additional leasing occurs in that area. As stated above, one colony (approximately 18.6 acres in size) was within the general analysis area for the North Porcupine LBA Tract in 2007; however, that colony is not located on USFS lands. That one colony would be affected by the proposed leasing action at some point in time. Mining disturbance associated with the adjacent North Antelope Rochelle Mine could impact those prairie dog colonies that exist elsewhere within the larger wildlife survey area surrounding this LBA tract (Figure H-4). Such impacts could have immediate results on prairie dogs if an occupied colony is abruptly subjected to a soil salvaging operation, or is otherwise impacted in a short timeframe that precludes dispersal prior to disturbance. However, as those activities typically occur incrementally across various portions of a mine permit area, some individuals could disperse to

undisturbed portions of the affected colony, or create one or more new colonies within the general area.

The South Porcupine LBA tract and its general analysis area are almost entirely encompassed by the existing North Antelope Rochelle Mine permit area; therefore, it is possible that surface disturbance associated with coal removal from the mine's current leases could occur on the tract, regardless of whether or not additional leasing occurs in that area. As no colonies are present in the South Porcupine tract's general analysis area, leasing and mining this LBA tract under either the Proposed Action or Alternative 2 would not disturb any existing prairie dog colonies. However, mining disturbance associated with the adjacent North Antelope Rochelle Mine could impact those prairie dog colonies that exist elsewhere within the larger wildlife survey area surrounding the tract (Figure H-5). Such impacts could have immediate results on prairie dogs if an occupied colony is abruptly subjected to a soil salvaging operation, or is otherwise impacted in a short timeframe that precludes dispersal prior to disturbance. However, as those activities typically occur incrementally across various portions of a mine permit area, some individuals could disperse to undisturbed portions of the affected colony, or create one or more new colonies within the general area.

Smaller-scale disturbances associated with both the mining and CBNG industries can also impact prairie dog colonies and surrounding vegetation through fragmentation or loss of foraging and burrowing habitat. Linear disturbances associated with mining infrastructure, such as roads, power lines, fences, and pipelines will occur within narrow corridors over relatively short distances, and would be completed within shorter timeframes than the advancement of a surface mine pit. However, such disturbances would still pose some level of risks due to vehicular collisions or by enhancing habitat for mammalian and avian species that prey on prairie dogs.

Some linear impacts could be minimized or mitigated through the consolidation of roads and electric utilities within common corridors, applying perch deterrents on overhead power poles, and reseeding pipeline disturbances quickly with appropriate seed mixes for the region. Minor surface disturbance near existing colonies would provide recently upturned soils that could facilitate the expansion of the existing colonies or the establishment of new ones, as prairie dogs will readily move into recently disturbed areas. Post-mining reclamation could have similar potential benefits; prairie dogs have already demonstrated their ability to inhabit reclaimed lands at the nearby Antelope Mine (BLM 2008).

As no prairie dog colonies are present on USFS lands within the North and South Porcupine tracts' general analysis areas, no USFS Standards and Guidelines applicable to black-tailed prairie dogs would be implemented.

Determination of Effect and Rationale – North Hilight Field LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Only two of the four black-tailed prairie dog colonies within the wildlife survey areas for the North Hilight Field LBA Tract would be physically disturbed by mining activities within the tract's general analysis area, if the lease is issued. Those two colonies encompassed less than 23 acres, and neither of which were on USFS lands in 2007. Given the fact that two of the four colonies within the wildlife survey areas for the North Hilight Field LBA Tract were outside of the general analysis area (area of potential surface disturbance) associated with this proposed lease, the tendency of prairie dogs to disperse and expand their boundaries, and the incremental nature of surface coal mining relative to some other disturbance activities, the potential impacts to prairie dog colonies on and near USFS lands in the North Hilight Field LBA Tract would not have adverse consequences for the viability of the local or regional population. Disturbance and reclamation efforts will occur incrementally in varying locations throughout the permit area as mining progresses through the approved lease.

Determination of Effect and Rationale – South Hilight Field LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Only one of the seven black-tailed prairie dog colonies within the wildlife survey area for the South Hilight Field LBA Tract would be physically disturbed by mining activities within the tract's general analysis area, if the lease is issued. That colony encompassed less than 1 acre in 2007, and it was on USFS lands. Given the fact that six of the seven colonies within the wildlife survey area for the South Hilight Field LBA Tract were outside of the general analysis area (area of potential surface disturbance) associated with this proposed lease, the tendency of prairie dogs to disperse and expand their boundaries, and the incremental nature of surface coal mining relative to some other disturbance activities, the potential impacts to prairie dog colonies on and near USFS lands in the South Hilight Field LBA Tract would not have adverse consequences for the viability of the local or regional population. Disturbance and reclamation efforts will occur incrementally in varying locations throughout the permit area as mining progresses through the approved lease.

Determination of Effect and Rationale – West Hilight Field LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Only one of the eight black-tailed prairie dog colonies within the wildlife survey area for the West Hilight Field LBA Tract would be physically disturbed by mining activities within the tract's general analysis area, if the lease is issued. That colony encompassed 89.1 acres in 2007, and it was on USFS lands. Given the fact that seven of the eight colonies within the wildlife survey area for the West Hilight Field LBA Tract were outside of the general

analysis area (area of potential surface disturbance) associated with this proposed lease, the tendency of prairie dogs to disperse and expand their boundaries, and the incremental nature of surface coal mining relative to some other disturbance activities, the potential impacts to prairie dog colonies on and near USFS lands in the West Hilight Field LBA Tract would not have adverse consequences for the viability of the local or regional population. Disturbance and reclamation efforts will occur incrementally in varying locations throughout the permit area as mining progresses through the approved lease.

Determination of Effect and Rationale – North Porcupine LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No black-tailed prairie dog colonies would be physically disturbed by mining activities on USFS lands within the tract's general analysis area, if the lease is issued. Only one colony (approximately 18.6 acres in size) is present on non-federal lands in the North Porcupine tract general analysis area. Prairie dog colonies located within the existing North Antelope Rochelle Mine permit area could be impacted by mining operations regardless of whether the North Porcupine LBA Tract is leased. Given the limited additional impacts to prairie dog colonies within the North Porcupine tract's general analysis area, the tendency of prairie dogs to disperse and expand their boundaries, and the incremental nature of surface coal mining relative to some other disturbance activities, the potential impacts to prairie dog colonies on and near USFS lands in the North Porcupine tract's wildlife survey area would not have adverse consequences for the viability of the local or regional population. Disturbance and reclamation efforts will occur incrementally in varying locations throughout the permit area as mining progresses through the approved lease.

Determination of Effect and Rationale – South Porcupine LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No black-tailed prairie dog colonies would be physically disturbed by mining activities on USFS lands within the tract's general analysis area, if the lease is issued. No colonies are present on either federal or non-federal lands in the South Porcupine tract's general analysis area. Prairie dog colonies located within the existing North Antelope Rochelle Mine permit area could be impacted by mining operations regardless of whether the South Porcupine LBA Tract is leased. Given the tendency of prairie dogs to disperse and expand their boundaries, and the incremental nature of surface coal mining relative to some other disturbance activities, the potential impacts to prairie dog colonies on and near USFS lands in the South Porcupine tract's wildlife survey area would not have adverse consequences for the viability of the local or regional population. Disturbance and reclamation efforts will occur incrementally in varying locations throughout the permit area as mining progresses through the approved lease.

H-3.2.20 Swift Fox (*Vulpes velox*)

The swift fox was removed from the USFWS federal listing process in 1995, after extensive field surveys demonstrated that the population was greater than expected. This species is considered to be common within the eastern Great Plains grasslands of Wyoming (Cerovski et al. 2004), though it typically occurs at very low densities. The exact status of the population is unknown but believed to be increasing, especially in the Northern Plains. Swift foxes are largely nocturnal and typically prefer flat to gently rolling, short- or mixed-grass prairies, generally lacking in shrubs or woody vegetation (Cotterill 1997). This species uses multiple den sites year-round for shelter, protection from predators, and rearing young. Burrows of other mammals such as badgers (*Taxidea taxus*), red foxes (*Vulpes vulpes*), and prairie dogs are often used or modified for those purposes. Small to mid-sized mammals constitute the bulk of their diet. Swift foxes have little fear of humans and may den in proximity to human disturbances (residences and busy roadways). This tolerance also makes them susceptible to trapping, vehicle collisions, and attacks by dogs. Major threats faced by the swift fox include habitat loss and degradation, interspecific competition with red fox and coyote (*Canis latrans*), and vehicle collisions.

Existing Conditions – North, South and West Hilight Field LBA Tracts

Swift fox have been observed in large grassland blocks in southern Campbell County with more frequency in recent years, and are presumed to breed there. This species has also been documented within the overall TBNG. However, sagebrush communities dominate the general analysis areas for the North Hilight Field, South Hilight Field, and West Hilight Field LBA Tracts, as well as USFS lands in that area. The prevalence of sagebrush throughout this area largely explains the extremely limited sightings of this grassland fox over the last 25 years, as described below. Burrows within the existing black-tailed prairie dog colonies and scattered badger or red fox burrows could be used by swift foxes as den or shelter sites, and swift fox could forage in the area.

No specific surveys for swift fox were conducted for this analysis. However, such efforts were completed in 2002 using USFS survey protocols for other unrelated projects. Those surveys occurred within 13.5 miles of USFS lands in the North Hilight Field Tract's general analysis area; within 2.0 miles of USFS lands in the South Hilight Field Tract's general analysis area; and within 6.0 miles of USFS lands in the West Hilight Field Tract's general analysis area. Nocturnal spotlight surveys for rabbits and hares were conducted as part of annual wildlife monitoring at adjacent existing mines every year since at least 1994, with diurnal surveys for a variety of vertebrate species occurring across all seasons annually since the early 1980s. All of those survey efforts overlapped significant portions of the North Hilight Field, South Hilight Field, and West Hilight Field tract's wildlife survey areas.

As a result of those combined efforts, one swift fox sighting was made approximately 5 miles south of the North Hilight Field tract, on USFS lands in the South Hilight Field tract, along Little Thunder Creek between 1995 and

1997, in T.43N., R.71W., SE¼ Section 23 (USFS 2003). A lone fox was also observed on adjacent lands in T.43N., R.71W., SW¼ Section 14 during that period. No swift foxes have ever been recorded on USFS or other lands within the general analysis areas for the North and West Hilight Field LBA Tracts. No swift foxes have been recorded elsewhere in the overall Black Thunder Mine annual monitoring area since surveys began in 1983.

Few other swift fox sightings have been recorded elsewhere within the surrounding region during specific surveys or incidental to other searches at local mines over the last 25 years. Those efforts were conducted as part of annual wildlife monitoring by contract and USFS biologists on private and federal lands in the area. One swift fox was documented approximately 4 to 6 miles south of USFS lands within the general analysis area for the South Hilight Field tract, in T.42N., R.70W., SE¼ Section 15, during spotlight trapping efforts for sage-grouse at the nearby North Antelope Rochelle Mine in March 2002. The nearest other sighting occurred in T.43N., R.72W., SE¼ Section 20 between 1995 and 1997. Reports from all annual monitoring and special studies are on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

Existing Conditions – North and South Porcupine LBA Tracts

Swift fox have been observed in large grassland blocks in southern Campbell County with more frequency in recent years, and are presumed to breed there. This species has also been documented within the overall TBNG.

Sagebrush communities generally dominate the wildlife survey area for the North Porcupine LBA Tract, though grasslands are more prevalent in the southwestern portion of the tract's general analysis area. Potential swift fox habitat in that area is largely restricted to the western extent, west of the Antelope Road (Figure H-4). The South Porcupine tract's general analysis area is dominated by various native and introduced grassland species considered suitable habit for this species. However, the prevalence of sagebrush throughout these two tracts' wildlife survey areas largely explains the extremely limited sightings of this grassland fox over the last 25 years of monitoring efforts. Burrows within the existing black-tailed prairie dog colonies and scattered badger or red fox burrows could be used by swift foxes as den or shelter sites, and swift fox could forage in the area.

No specific surveys for swift fox were conducted for this analysis. However, such efforts were completed in 2002 using USFS survey protocols for other unrelated projects. Those surveys included USFS lands within and immediately adjacent to the North and South Porcupine tracts' general analysis areas, as well as additional lands in the surrounding area. Nocturnal spotlight surveys for rabbits and hares were conducted as part of annual wildlife monitoring at adjacent existing mines every year since at least 1994, with diurnal surveys for a variety of vertebrate species occurring across all seasons annually since the early 1980s. All of those survey efforts overlapped all or

significant portions of the North and South Porcupine tracts' wildlife survey areas. Despite those combined survey efforts, no swift fox have ever been recorded on USFS or other lands within the North and South Porcupine tracts' general analysis areas.

Few other swift fox sightings have been recorded elsewhere within the North Porcupine tract's wildlife survey area or surrounding region during specific surveys or incidental to other searches at local mines over the last 25 years. Those efforts were conducted as part of annual wildlife monitoring by USFS and contract biologists on private and federal lands in the area. One swift fox was documented on USFS lands approximately 0.5 mile northeast of the North Porcupine tract's general analysis area in March 2002. The fox was observed in T.42N., R.70W., SE¼ Section 15 during spotlight trapping efforts for sage-grouse at the nearby North Antelope Rochelle Mine. Swift fox have been observed on private surface in the southwestern portion of the two-mile wildlife survey area for the South Porcupine tract in recent years. Two individuals (an adult and juvenile) were observed during spotlight lagomorph surveys conducted for the adjacent Antelope Mine on private surface (in T.41N., R.71W., NW¼ SW¼ Section 22 and NE¼ SW¼ Section 22, respectively) approximately 4 miles south of the North Porcupine tract's general analysis area in October 2005. A pair of swift foxes was observed in the adjacent sections to the west and south during similar spotlight surveys conducted in both 2006 and 2007.

<u>Direct and Indirect Effects – North, South and West Hilight Field LBA Tracts</u>
Due to the overall poor quality habitat conditions on USFS and adjacent lands in the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts' general analysis areas, and the sightings of very few swift fox in that general area over the last 25 years of annual monitoring (including spotlight searches for other species), no direct or indirect impacts are anticipated for this species. Given these circumstances, species-specific Standards and Guidelines outlined in the TBNG Plan (USFS 2002, page 1-20) would not apply.

<u>Direct and Indirect Effects – North and South Porcupine LBA Tracts</u>
Due to absence of swift fox observations in the general analysis area for the North Porcupine tract, the limited presence of suitable habitats on USFS and adjacent lands in that area and the surrounding wildlife survey area, and the lone sighting of a single swift fox in that area over the last 25 years of annual monitoring (including spotlight searches for other species), no direct or indirect impacts are anticipated for this species within the North Porcupine tract's general analysis area. Given these circumstances, species-specific Standards and Guidelines outlined in the TBNG Plan (USFS 2002, page 1-20) would not apply.

Suitable but unoccupied swift fox habitat is present on and near USFS lands and adjacent lands within the general analysis area for the South Porcupine LBA Tract, though individuals have been observed in recent years

approximately 1.25 miles to the southwest, within the surrounding wildlife survey area for this LBA tract. Should this species be present on those lands in the future, direct loss of or injury to individuals foraging or denning within, or passing through that area could result from vehicle collisions or encounters with equipment associated with mine-related activities. Swift fox are relatively tolerant of human activities, but may avoid areas directly affected by mine operations as human presence and noise escalate with active mining. As the population size and residency status of the individuals in the area are largely unknown, some swift fox may remain within undisturbed habitats in the vicinity of mining encroachment.

For the South Porcupine LBA Tract, the Proposed Action or Alternatives could also disturb potential swift fox foraging, denning, or shelter habitat on USFS and adjacent lands within the tract's general analysis area. Those habitats could be removed, altered, or fragmented to varying degrees by one or more mine- or non-mine-related activities such as topsoil removal and a variety of linear disturbances (e.g., roads, fences, power lines, and pipelines). However, the latter disturbances will occur within narrow corridors over relatively short distances, and will typically be completed within a few days. Linear disturbances and habitat alterations could also provide convenient travel corridors and habitat for larger mammalian predators that could compete with swift foxes for prey species. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area and on USFS lands as mining operations progress. Reclamation of disturbed areas will occur incrementally as mining is completed in a given portion of the area, and will eventually provide additional foraging and potential denning habitat for the swift fox. Surface disturbing activities may result in a short-term, localized decrease in prey base (small rodents and voles), but due to their high reproductive potential and tendencies to re-establish and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance. Should swift fox be documented on or adjacent to USFS lands in the tract's general analysis area, that agency would determine whether species-specific Standards and Guidelines outlined in the TBNG Plan (USFS 2002, page 1-20) would apply.

<u>Determination of Effect and Rationale – North Hilight Field LBA Tract</u>
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Habitat conditions in the North Hilight Field tract's general analysis area are considered poor quality due to the prevalence of sagebrush shrublands and limited presence of grassland expanses. Only two observations of swift fox have been recorded in the general region despite annual monitoring surveys in all or most of those areas over the last 25 years, and both were 4 to 5 miles south of this LBA tract. Furthermore, sufficient suitable habitat (grasslands) is present elsewhere within the general vicinity that could sustain swift foxes as project activities disturb the general analysis area for the North Hilight Field LBA tract. Existing and future reclaimed grasslands will create or

enhance potential swift fox habitat once mining has been completed in the tracts.

Determination of Effect and Rationale – South Hilight Field LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Habitat conditions in the South Hilight Field tract's general analysis area are considered poor quality due to the prevalence of sagebrush shrublands and limited presence of grassland expanses. The only swift fox observation ever recorded on USFS lands in the South Hilight Field Tract occurred along Little Thunder Creek 11 to 13 years ago, despite annual monitoring surveys in all or most of those areas during and subsequent to that time. Only one other observation of a swift fox has been recorded in the tract's wildlife survey area during that period, although it was outside of the tract's general analysis area. Furthermore, sufficient suitable habitat (grasslands) is present elsewhere within the general vicinity that could sustain swift foxes as project activities disturb the general analysis area for this LBA tract. Existing and future reclaimed grasslands will create or enhance potential swift fox habitat once mining has been completed in the tract.

Determination of Effect and Rationale – West Hilight Field LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Habitat conditions in the West Hilight Field tract's general analysis area are considered poor quality due to the prevalence of sagebrush shrublands and limited presence of grassland expanses. Only two swift fox observations have ever been recorded near this tract, both of which occurred approximately 13 years ago on adjacent lands roughly one mile east of the tract's general analysis area. Furthermore, sufficient suitable habitat (grasslands) is present elsewhere within the general vicinity that could sustain swift foxes as project activities disturb the general analysis area for this LBA tract. Existing and future reclaimed grasslands will create or enhance potential swift fox habitat once mining has been completed in the tract.

Determination of Effect and Rationale – North Porcupine LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Habitat for this species on USFS lands within the western portion of the general analysis area for the North Porcupine LBA Tract is currently considered as suitable but unoccupied. No fox sightings have been documented on those USFS lands during specific and incidental surveys conducted over the last 25 years (1984-2007). Only four sightings have been recorded within or near the tract's two-mile wildlife survey area during that period: one in 2002, and three since 2005. The three most recent sightings were at least 3 miles to the south, and on the far side of a railroad and county road between the sightings and the nearest USFS lands.

Determination of Effect and Rationale – South Porcupine LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Habitat for this species on USFS lands within the general analysis area for the South Porcupine LBA Tract is currently considered as suitable but unoccupied. No fox sightings have been documented on those USFS lands during specific and incidental surveys conducted over the last 25 years (1984-2007). Only four sightings have been recorded within or near the South Porcupine tract's two-mile wildlife survey area during that period: one in 2002, and three since 2005. The three most recent sightings were at least 1.75 miles to the southwest, and on the far side of a railroad and county road between the sightings and the nearest USFS lands.

H-3.2.21 Long-billed curlew (*Numenius americanus*)

Long-billed curlews breed from interior British Columbia and southern Alberta through southern Manitoba, south to central California, and east to western North Dakota, central South Dakota, central Nebraska, western Kansas, northeastern New Mexico, and northern Texas (Dechant et al. 2003a). The long-billed curlew is a relatively uncommon summer resident of grasslands and sagebrush-grasslands in Wyoming (Cerovski et al. 2004). Curlews are ground nesters, and require large open expanses of grassland, with relatively low vegetation and few shrubs in which to nest (Hill 1998). The nest is typically a shallow scrape or depression, thinly lined with grass, weeds or cow dung, typically near water or moist areas.

Curlews use historically occupied sites each year, and some individual birds may reuse the same territories from year to year (Dechant et al. 2003a). Curlews primarily feed upon insects but also eat other invertebrates, small crustaceans, toads, and eggs and nestlings of other birds. This species forages in grasslands, wet meadows, prairie dog colonies, and occasionally along the margins of wetlands. Lakeshores and river valleys are often used during fall as migration staging areas (Hill 1998). Although some populations may be declining, overall population trends suggest long-billed curlew numbers are stable or increasing slightly. The major factor affecting curlew populations is habitat destruction and fragmentation.

Existing Conditions – North, South and West Hilight Field LBA Tracts
Long-billed curlews are uncommon summer residents within the TBNG. The areas evaluated for this analysis include USFS and adjacent lands within the general analysis areas for the North, South and West Hilight Field LBA Tracts. As described above for the northern leopard frog and swift fox, those areas are dominated by sagebrush habitats with scattered stands of upland grasslands and few surface water features. No significant wetlands (i.e., large lakes) or other persistent water conditions that might attract large numbers of curlews during migration exist within the North, South and West Hilight Field tracts' wildlife survey areas. Consequently, habitat conditions in the tracts' general analysis areas and surrounding lands would be suitable for foraging migrants,

but they do not provide large expanses of grassland areas for nesting activities. No long-billed curlews have ever been documented on USFS lands or adjacent lands in the general analysis areas or larger wildlife survey areas for the North, South and West Hilight Field LBA Tracts. Likewise, few curlews have been observed in the surrounding region during annual wildlife monitoring in the area over the last 24 or more years. Most of those sightings occurred during spring months and beyond USFS lands, and were likely individual migrants or non-breeding adults.

No nesting occurrences have been documented for long-billed curlews in southern Campbell County (Cerovski et al. 2004), including USFS lands in the North, South and West Hilight Field tracts' general analysis areas and adjacent lands. Potential foraging habitat is present on USFS and adjacent lands in those areas and elsewhere within the 2-mile wildlife survey perimeters, but nesting habitat conditions are poor to unsuitable. CBNG development activities occur throughout the region, with active mining (including open pits) also occurring in the near vicinity. Therefore, potential foraging habitats would be disturbed by the Proposed Action and Alternatives for these three LBA tracts.

<u>Existing Conditions – North and South Porcupine LBA Tracts</u>
Long-billed curlews are uncommon summer residents within the TBNG. However, no nesting occurrences have been documented for long-billed curlews in southern Campbell County (Cerovski et al. 2004), including USFS lands in the North and South Porcupine tracts' general analysis areas and adjacent lands. As described above, the general analysis area for the North Porcupine tract is dominated by sagebrush habitats and the general analysis area for the South Porcupine tract is dominated by upland grassland habitats. No significant wetlands (i.e., large lakes) or other persistent water conditions that might attract large numbers of curlews during migration exist within either the North or South Porcupine tracts' wildlife survey areas. Consequently, habitat conditions in these two LBA tracts' general analysis areas and surrounding lands would be suitable for foraging migrants, and they do not provide large expanses of grassland areas for nesting activities.

No long-billed curlews have ever been documented on USFS lands in the general analysis areas or larger wildlife survey areas for the North and South Porcupine LBA Tracts. Likewise, few curlews have been observed in the surrounding region during annual wildlife monitoring conducted in the general area over the last 25 years. Those general surveys occurred repeatedly throughout the breeding season each year. All curlew sightings that have occurred in the general region over time were recorded during spring months and were beyond USFS lands; those individuals were likely migrants or non-breeding adults.

Direct and Indirect Effects

Given the lack of sightings of long-billed curlews in the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts and surrounding areas over the last 25 years, and the fact that habitat conditions in those areas are only suitable for foraging migrants or non-breeding adults, the Proposed Action and Alternatives for each of the LBA tracts are unlikely to cause any direct injury or mortality to this species. However, if migrants were present, future mining activities could result in injuries or mortalities to foraging individuals. Foraging individuals may also be displaced by human activities and noise associated with mining. Potential foraging habitats may be disturbed, removed, or fragmented by mining activities. The type, timing, location, and extent of habitat disturbance will vary throughout the tracts' general analysis areas as operations progress. Reclamation of disturbed areas will occur incrementally as mining is completed in given portions of the three applicant mines, and will eventually mitigate impacts to some degree. The Jacobs Ranch, Black Thunder, and North Antelope Rochelle mine's reclamation plans would incorporate the replacement of jurisdictional wetland acreages existing prior to mining with at least equal types and numbers of wetland acreages. The creation of wetland habitats, especially where adjacent to native or reclaimed grassland habitats, could provide additional (although limited) foraging areas for curlews.

As no long-billed curlews have been documented within USFS lands or other lands in or near the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts' general analysis areas, and habitat conditions do not provide quality nesting areas, species-specific Standards and Guidelines outlined in the Grassland Plan (USFS 2002) would not apply.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. As this species appears to be an infrequent visitor to the six WAC LBA tracts' general analysis areas, and good quality foraging and nesting habitat is not present within the general Wright analysis area, impacts to this species are likely to be minimal. Loss, degradation, or fragmentation of potential foraging habitat and potential collisions with vehicles may occur. Enhanced water features and grasslands created by reclamation may provide some limited foraging or nesting habitats.

H-3.2.22 Ferruginous hawk (*Buteo regalis*)

Ferruginous hawks breed throughout much of the western United States and portions of three Canadian provinces (Johnsgard 1990). This species nests throughout Wyoming (Cerovski et al. 2004) and occupies portions of the state during winter. Large expanses of grassland and shrubland, where livestock grazing (vs. cultivation) is the predominant land use, provide the most suitable habitat (Schmutz 1989, Johnsgard 1990). Most ferruginous hawks in the PRB

nest on the ground (usually elevated sites, though some pairs nest in small trees). Typical nest sites include hilltops, rock outcrops, eroded creek banks, small trees, and even relatively level ground. The ferruginous hawk relies primarily on two mammalian families for the majority of its prey: *Leporidae* (rabbits and hares) and *Sciuridae* (ground squirrels and prairie dogs). Numerous nests can occur within the territory of a single pair, and ferruginous hawks often reuse nests for many years.

This species may be sensitive to human disturbance, especially during the nesting period (White and Thurow 1985). This sensitivity can be heightened in years of low prey abundance. Accurate information regarding the trend for the ferruginous hawk is limited and mixed. Some populations may be declining (Bechard and Schmutz 1995); however, overall population trends suggest numbers are stable or increasing (NatureServe 2007). Major factors affecting ferruginous hawk populations include habitat destruction and fragmentation, and human disturbance.

Existing Conditions – North Hilight Field LBA Tract

Annual monitoring has documented that ferruginous hawks nested in the vicinity of the Black Thunder Mine during each of the last 25 years, and fledged young in all but one of those years. Similar long-term nesting has occurred at the neighboring Jacobs Ranch and North Antelope Rochelle mines. Many of those nests were located on USFS lands. Details describing the number of intact and active nests within the mine monitoring survey areas in a given year are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

The presence or absence of nest material does not determine whether the USFS considers a site as "active" (occupied during at least 1 of the last 7 years). No ferruginous hawk nest sites have been documented on USFS lands within the North Hilight Field tract's general analysis area or surrounding 2-mile wildlife survey area during annual wildlife monitoring surveys conducted through 2007. Seven nest sites in two territories have been recorded on non-federal surface within the general analysis area through 2007; five of the seven sites still had nest material present that year (Figure H-1). Through 2007, 24 individual ferruginous hawk nests plus 3 multi-species sites used by ferruginous hawks and at least one other raptor species over the years have been identified within the tract's 2-mile wildlife survey area. The 27 nests represented at least 10 different territories. All but 9 of the 27 sites still had nest material present in 2007.

Existing Conditions – South Hilight Field LBA Tract

Annual monitoring has documented that ferruginous hawks nested in the vicinity of the Black Thunder Mine during each of the last 25 years, and fledged young in all but one of those years. Similar long-term nesting has occurred at the neighboring Jacobs Ranch and North Antelope Rochelle mines. Many of

those nests were located on USFS lands. Details describing the number of intact and active nests within the mine monitoring survey areas in a given year are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

The presence or absence of nest material does not determine whether the USFS considers a site as "active" (occupied during at least 1 of the last 7 years). Seven ferruginous hawk nest sites in two territories have been documented on USFS lands within the South Hilight Field tract's general analysis area during annual wildlife monitoring surveys conducted through 2007 (Figure H-2). Two of the seven sites still had nest material present that year. No nest sites were present on non-federal lands within the general analysis area during any monitoring year.

Nine additional ferruginous hawk nest sites in five territories have been recorded on USFS surface within the tract's 2-mile wildlife survey area through 2007; two of the nine sites had been used by ferruginous hawks and at least one other raptor species over the years. Five nest sites were still physically present in 2007. The remaining 30 nest sites (25 individual nests plus 5 multi-species sites) are located on non-federal lands within the 2-mile wildlife survey area; none of those nests are within the tract's general analysis area itself. The 30 nests were in at least 10 different territories. Only 10 of the 30 sites still had nest material present in 2007.

Existing Conditions – West Hilight Field LBA Tract

Annual monitoring has documented that ferruginous hawks nested in the vicinity of the Black Thunder Mine during each of the last 25 years, and fledged young in all but one of those years. Similar long-term nesting has occurred at the neighboring Jacobs Ranch and North Antelope Rochelle mines. Many of those nests were located on USFS lands. Details describing the number of intact and active nests within the mine monitoring survey areas in a given year are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

The presence or absence of nest material does not determine whether the USFS considers a site as "active" (occupied during at least 1 of the last 7 years). Three ferruginous hawk nest sites in two territories have been documented on USFS lands within the West Hilight Field tract's general analysis area during annual wildlife monitoring surveys conducted through 2007. Two sites still had nest material present that year (Figure H-3).

Only one additional nest site has been recorded on USFS surface within the 2-mile wildlife survey area through 2007. No material was present at the nest site in 2007. Nine additional nest sites in three territories were present on non-federal lands within the tract's general analysis area during the 2007 survey. Nest material was present at four of the nine sites that year.

An additional 40 nest sites (24 individual nests plus 6 multi-species sites) were located on non-federal lands within the tract's 2-mile wildlife survey area through 2007. The 40 nests were in at least 16 different territories. Only 23 of the 40 sites still had nest material present in 2007.

Existing Conditions – North Porcupine LBA Tract

Annual monitoring has documented that ferruginous hawks nested in the vicinity of the North Antelope Rochelle Mine every year since at least 1990, and fledged young in 17 of those 19 years. Similar long-term nesting has occurred at the neighboring Black Thunder and Antelope mines. Ferruginous hawks have nested on USFS lands in the North Porcupine tract's general analysis area. Details describing the number of intact and active nests within the mine monitoring survey areas in a given year are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

The presence or absence of nest material does not determine whether the USFS considers a site as "active" (occupied during at least 1 of the last 7 years). In 2007, 73 individual ferruginous hawk nests (21 territories) were present within the North Porcupine tract wildlife survey area, plus 14 other nest sites that have been used by ferruginous hawks and at least one other raptor species over the years (Figure H-4).

Four nest sites were on USFS surface within the general analysis area itself in 2007, three of which still had nest material present. Three additional individual ferruginous hawk nest sites and two multi-species nests were on non-federal lands within the general analysis area in 2007.

Existing Conditions – South Porcupine LBA Tract

Annual monitoring has documented that ferruginous hawks nested in the vicinity of the North Antelope Rochelle Mine every year since at least 1990, and fledged young in 17 of those 19 years. Similar long-term nesting has occurred at the neighboring Black Thunder and Antelope mines. Ferruginous hawks have nested on USFS lands in the South Porcupine tract's general analysis area. Details describing the number of intact and active nests within the mine monitoring survey areas in a given year are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

The presence or absence of nest material does not determine whether the USFS considers a site as "active" (occupied during at least 1 of the last 7 years). In 2007, 33 individual ferruginous hawk nests (11 territories) were present within the South Porcupine wildlife survey area, plus 5 other nest sites that have been used by ferruginous hawks and at least one other raptor species over the years (Figure H-5).

Five individual ferruginous hawk nest sites were on USFS lands within the general analysis area itself in 2007, one of which still had nest material present. Five additional individual nest sites were on non-federal lands in that area in 2007.

Direct and Indirect Effects

Over time, the Black Thunder Mine has avoided, where possible, or mitigated mining impacts on raptor nests through a variety of means. The mine has voluntarily monitored nesting raptor populations in a perimeter larger than required annually since 1983, maintained and implemented current USFWS approved Raptor Mitigation Plans, adjusted operations to provide temporal and spatial buffers around raptor nests, and ensured that new power lines at the mine conform to current Avian Power Line Interaction Commission (APLIC) guidelines.

As indicated previously, only a few acres in the North and South Porcupine tracts' general analysis areas are not already encompassed by the existing North Antelope Rochelle Mine's existing permit area. Surface disturbance is therefore likely to occur in those areas, regardless of the proposed leasing decision. However, the North Antelope Rochelle Mine has avoided, where possible, or mitigated mining impacts on raptor nests through a variety of means. The mine has also maintained and implemented current USFWS approved Raptor Mitigation Plans, adjusted operations to provide temporal and spatial buffers around raptor nests, and ensured that new power lines at the mine conform to current Avian Power Line Interaction Commission (APLIC) guidelines.

Provided those practices are continued, direct impacts on ferruginous hawks and their active nest sites will be minimized, both on and near USFS lands. Due to restrictions on disturbance near active nest sites, the most probable source of potential impact to ferruginous hawks themselves would be an increase in injuries and fatalities of individuals foraging within the WAC LBA tracts' general analysis areas due to vehicle collisions associated with ongoing or future mining and other activities. The use of existing roads in the area, when possible, would help to minimize this risk.

Habitat loss, degradation, and fragmentation would result from a variety of large- and small-scale mining operations such as soil salvaging and reservoir/flood construction, among others. 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. Those disturbances could also create new travel corridors for mammalian predators that reside in or pass through the area. However, many such 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. All mine-related habitat disturbances would shift throughout

the expanded permit area as operations progress. Reclamation of disturbed areas would occur incrementally as resource recovery is completed in a given portion of the mine, and would mitigate impacts to some degree. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (lagomorphs and rodents) for ferruginous hawks. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

USFS Standards and Guidelines would be implemented and offer additional protections for active nests; they would apply only to activities outside of the lease area. These protocols should help ensure that the Proposed Action and Alternatives do not significantly degrade the quality of existing ferruginous hawk territories and nest sites. Standards and Guidelines specific to ferruginous hawks outlined in the TBNG Plan (USFS 2002, page 1-20-21) are as follows:

73. To help prevent abandonment, reproductive failure or nest destruction, prohibit development of new facilities within 0.25 mile (or line of sight) of active ferruginous hawk nests. For the ferruginous hawk, a nest is no longer considered active if it is known to have been unoccupied for the last seven years. This does not apply to pipelines, fences and underground utilities.

74. To help reduce disturbances to nesting ferruginous hawks, prohibit the following activities within 0.5 mile (or line of sight) of active ferruginous hawk nests from 1 March through 31 July: construction (e.g., roads, water impoundments, oil and gas facilities), reclamation, gravel mining operations, drilling of water wells, and oil and gas drilling.

75. To help reduce disturbances to nesting ferruginous hawks, do not authorize the following activities within 0.5 mile (line of sight) of active ferruginous hawk nests from 1 March through 31 July: construction (e.g., pipelines, utilities, fencing), seismic exploration, and workover operations for maintenance of oil and gas wells.

<u>Determination of Effect and Rationale</u>
Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area.

Mine-related activities will not physically disturb any ferruginous hawk nest sites on USFS lands in the North Hilight Field tract's general analysis area. All ferruginous hawk nests located within the South Hilight Field tract's general analysis area are located on federal surface. Most ferruginous hawk nests located within the West Hilight Field tract's general analysis area are located on non-federal surface. Mine-related activities will likely disturb ferruginous hawk

nest sites on USFS lands in the North Porcupine tract's wildlife survey area. Mine-related activities will likely disturb ferruginous hawk nest sites on USFS lands in the South Porcupine tract's wildlife survey area. Some individuals or pairs may experience disturbance, destruction, or fragmentation of nesting and foraging habitat. However, ferruginous hawks typically have alternate nest sites within the same territories, and therefore many alternative nests occur beyond the tracts' general analysis areas and thus are less likely to be impacted by future mining disturbance associated with the proposed leasing actions.

Increased disturbance to individuals due to human activity may also occur. However, several factors should minimize the potential mining-related impacts on this species, including the availability of alternate nest sites located further away from pending disturbance in each affected territory, implementation of USFWS and USFS approved mitigation measures, reclaiming habitats as soon as feasible, encouraging nesting within mine reclamation lands through artificial nest structures and habitat features such as rock piles and tree plantings that attract prey species, and continued monitoring of this species to ensure that mitigation methods are applied when necessary.

H-3.2.23 Burrowing owl (*Athene cunicularia*)

Burrowing owls breed from southern Alberta to southwestern Saskatchewan, south through east-central Washington, central Oregon, and southern California, and east to eastern North Dakota, west-central Kansas, and Texas (Klute et al. 2003, pg 7). The burrowing owl is a summer resident of open rangeland habitats throughout Wyoming (Cerovski et al. 2004). This species requires burrows of fossorial mammals, primarily badgers and prairie dogs, for nesting and roosting (Klute et al. 2003, pg 12).

Most burrowing owl nests within the TBNG are located within prairie dog colonies (USFS 2003). Burrowing owls typically reuse traditional nesting areas. Burrow mounds, shrubs, fence posts or boulders may be used as observation perches. This species is usually tolerant of human activity but is vulnerable to predation by pets (cats, dogs). Burrowing owls forage within a variety of habitats, including cropland, pasture, prairie dog colonies, fallow fields, and sparsely vegetated areas. This species is often active during daylight hours. Insects and small mammals (mice and voles) are the owls' primary prey items. Burrowing owl populations have been declining throughout its range, primarily due to habitat loss.

Existing Conditions – North, South and West Hilight Field LBA Tracts

Burrowing owls are common summer residents within the TBNG (Cerovski et al. 2004). This species was first recorded nesting in the Black Thunder Mine annual monitoring 2-mile perimeter in 1988. Despite the presence of potential nesting habitat (prairie dog and badger burrows) in the monitoring area, this species nested in only 5 of the subsequent 19 years. All known burrowing owl nest sites in the mine monitoring area have been in prairie dog burrows. Four

artificial nest boxes have been constructed in the mine's 2-mile perimeter wildlife survey area for mitigation purposes over the years, but no owls have ever been observed at or near them.

No burrowing owl nest sites have been documented on USFS lands within the North Hilight Field tract's general analysis area or the tract's surrounding wildlife survey area through 2007. Two nest sites in one territory have been identified in a small (18 acres) prairie dog colony on non-federal lands located within the tract's general analysis area (Figure H-1). The colony is approximately 4 miles west of the nearest USFS lands within the tract's general analysis area, and 3 miles northwest of the nearest USFS lands in the surrounding 2-mile perimeter. The USFS buffer for this species is 0.25 mile. A smaller (3 acres) colony is also present in the general analysis area, but no burrowing owls have been recorded there. One artificial nest box (BO5) was created in the LBA tract's 2-mile wildlife survey area, but it has never been used by burrowing owls.

No burrowing owl nest sites had been documented within the entire South Hilight Field tract's general analysis area or the tract's surrounding wildlife survey area through 2007, including all USFS lands in that area. Only one small (less than 1 acre) prairie dog colony (potential burrowing owl nesting habitat) is present within the tract's general analysis area, though larger colonies do occur in the surrounding 2-mile wildlife survey area (Figure H-2). Badger burrows undoubtedly occur in the area, but are not typically recorded.

No burrowing owl nest sites had been documented within the general analysis area for the West Hilight Field LBA Tract through 2007, including USFS lands within that area. One burrowing owl nest site has been recorded on non-federal lands in the northwestern corner of the general analysis area and approximately 0.25 mile from the nearest USFS lands (Figure H-3). The disturbance-free buffer for active nests of this species is 0.25 mile. This nest site was active in 2007, but no young fledged. Two additional burrowing owl nest sites (one territory) have been documented in the northeastern portion of the two-mile wildlife survey area. Those nests are located within the North Hilight Field LBA Tract as applied for (refer to Section H-3.3.23). Potential nesting habitat for burrowing owls is present in a prairie dog colony (approximately 89 acres in size) within the West Hilight Field tract's general analysis area, which is located on USFS lands. Another prairie dog colony (about 7 acres in size) is located about 0.25 mile east of the West Hilight Field tract's general analysis area (Figure H-3), and in any badger burrows that might be present in the area would also provide potential nesting habitat for burrowing owls.

<u>Existing Conditions – North and South Porcupine LBA Tracts</u>
Burrowing owls are common summer residents within the TBNG (Cerovski et al. 2004). This species was observed nested in the North Antelope Rochelle Mine's monitoring area in 1985 and 1989. Despite the presence of potential

nesting habitat (prairie dog and badger burrows) in the monitoring area, nesting owls were not found again until 1997. Burrowing owls have nested in the mine's monitoring area in most years since then, especially within a prairie dog colony located in T.41N., R.70W., Section 17, just east of the southeastern corner of the South Porcupine LBA Tract (Figure H-5).

One burrowing owl nest site has been identified in a small (19 acres in size) prairie dog colony within the North Porcupine tract's general analysis area. This colony and nest site are located immediately adjacent to USFS lands (Figure H-4). The USFS buffer for this species is 0.25 mile. No burrowing owl nest sites have been documented on USFS lands within the North Porcupine tract's general analysis area. A total of seven nest sites have been recorded on USFS lands in the surrounding wildlife survey area through 2007; one of which is in a prairie dog colony located approximately 0.25 mile east of the general analysis area, in T.42N., R.70W., Section 25.

No burrowing owl nest sites had been documented within the South Porcupine tract's general analysis area through 2007, including USFS lands in that area. Eleven nest sites have been recorded in the surrounding 2-mile wildlife survey area: one on USFS lands and 10 on non-federal surface. Seven of those 11 nest sites were in a single prairie dog colony located approximately 0.4 mile east of the southeastern corner of this general analysis area in T.41N., R.70W., Section 17 (Figure H-5).

Direct and Indirect Effects – North Hilight Field LBA Tract

No known burrowing owl nest sites are present on USFS lands in the general analysis area for the North Hilight Field LBA Tract, or within 0.25 mile of those lands (the USFS buffer for that species). Potential nesting habitat in the vicinity of this LBA tract is largely limited to the two relatively small prairie dog colonies located in the tract's general analysis area. Therefore, leasing the North Hilight Field LBA Tract would not result in any direct or indirect effects to nesting burrowing owls. Both USFS Standards and Guidelines (USFS 2002) and Black Thunder Mine's mine permit (TBCC 2005) stipulate that clearance surveys will be conducted and approved by the appropriate agencies before any colony is disturbed during the breeding season. That process will preclude most direct impacts to new nesting burrowing owls in that area.

Due to the strong (but not exclusive) relationship between burrowing owls and prairie dog colonies, many of the indirect effects described above for the black-tailed prairie dog, would also apply to burrowing owls and, thus, will not be repeated in full detail here. Because burrowing owls are active during daylight hours, the most probable source of direct impacts would be the death of, or injury to, individuals fleeing heavy equipment, or being killed or injured by equipment while feeding or moving through the mine area. Burrowing owls are generally tolerant of human activities, but increased presence and noise, especially during the nest initiation period, may displace individuals or inhibit

nesting proximate to mine operations. Foraging could also be hindered within these areas, especially where mining activities occur near prairie dog colonies.

As described previously, mining could eventually disturb or eliminate prairie dog colonies (potential nesting habitat) in the general analysis area for the North Hilight Field LBA Tract (21 total acres). However, the limited presence or long-term absence of nesting burrowing owls in those colonies, in combination with the presence of other non-disturbed colonies in the area and the ability for prairie dogs to recolonize reclamation, would mitigate those losses to a large extent. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (rodents, non-flying insects) for burrowing owls. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

Additionally, the tendency of prairie dogs to quickly colonize nearby areas when their colonies are disturbed would create new nesting habitat for burrowing owls. Overall, nesting and foraging habitats will be incrementally affected by a variety of large-and small-scale operations. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area as mining operations progress, thus providing opportunities for burrowing owls to relocate to other suitable habitat within the immediate area.

Reclamation will proceed incrementally as areas are mined and activities move to new locations within the mine area. Both activities will create loose soil that should be attractive to dispersing prairie dogs (potential habitat source), at least in the short term. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine, and will eventually mitigate habitat impacts to some degree. However, to date, burrowing owls have rarely been documented nesting within reclaimed habitats at surface mines in the PRB of northeast Wyoming.

If nesting burrowing owls are documented on or near USFS lands in the North Hilight Field LBA Tract, USFS Standards and Guidelines applicable to this species would be implemented on applicable lands to offer additional protections beyond those outlined in the USFWS approved Raptor Mitigation Plan for the Black Thunder Mine. Annual monitoring of known burrowing owl nest sites within the 2-mile wildlife survey area for the mine, including USFS and adjacent lands, and other nearby colonies will continue through the life of the mine to document their histories of occupancy and production.

Direct and Indirect Effects – South Hilight Field LBA Tract

No known burrowing owl nest sites are present on USFS lands in the general analysis area for the South Hilight Field LBA Tract, or within 0.25 mile of those lands (the USFS buffer for that species). Potential nesting habitat is largely limited to a lone, very small prairie dog colony in the tract's general analysis area. Therefore, leasing the South Hilight Field LBA Tract would not result in any direct or indirect effects to nesting burrowing owls. Both USFS Standards

and Guidelines (USFS 2002) and the Black Thunder Mine's mine permit (TBCC 2005) stipulate that clearance surveys will be conducted and approved by the appropriate agencies before any colony is disturbed during the breeding season. That process will preclude most direct impacts to new nesting burrowing owls in that area.

Because burrowing owls are active during daylight hours, the most probable source of direct impacts would be the death of, or injury to, individuals fleeing heavy equipment, or being killed or injured by equipment while feeding or moving through the mine area. Burrowing owls are generally tolerant of human activities, but increased presence and noise, especially during the nest initiation period, may displace individuals or inhibit nesting proximate to mine operations. Foraging could also be hindered within these areas, especially where mining activities occur near prairie dog colonies.

As described previously, mining could eventually disturb or eliminate prairie dog colonies (potential nesting habitat) in the general analysis area for the South Hilight Field LBA Tract (1 acre). However, the limited presence or long-term absence of nesting burrowing owls in that colony, in combination with the presence of other non-disturbed colonies in the area and the ability for prairie dogs to recolonize reclamation, would mitigate those losses to a large extent. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (rodents, non-flying insects) for burrowing owls. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

Additionally, the tendency of prairie dogs to quickly colonize nearby areas when their colonies are disturbed would create new nesting habitat for burrowing owls. Overall, nesting and foraging habitats will be incrementally affected by a variety of large-and small-scale operations. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area as mining operations progress, thus providing opportunities for burrowing owls to relocate to other suitable habitat within the immediate area.

Reclamation will proceed incrementally as areas are mined and activities move to new locations within the mine area. Both activities will create loose soil that should be attractive to dispersing prairie dogs (potential habitat source), at least in the short term. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine, and will eventually mitigate habitat impacts to some degree. However, to date, burrowing owls have rarely been documented nesting within reclaimed habitats at surface mines in the PRB of northeast Wyoming.

If nesting burrowing owls are documented on or near USFS lands in the South Hilight Field LBA Tract, USFS Standards and Guidelines applicable to this species would be implemented on applicable lands to offer additional protections beyond those outlined in the USFWS approved Raptor Mitigation

Plan for the Black Thunder Mine. Annual monitoring of known burrowing owl nest sites within the 2-mile wildlife survey area for the mine, including USFS and adjacent lands, and other nearby colonies will continue through the life of the mine to document their histories of occupancy and production.

Direct and Indirect Effects – West Hilight Field LBA Tract

No known burrowing owl nest sites are present on USFS lands in the general analysis area for the West Hilight Field LBA Tract. One existing nest site is approximately 0.25 mile of those lands (the USFS buffer for that species is 0.25 mile). Potential nesting habitat in the vicinity of this LBA tract is largely limited to the large prairie dog colony located along Little Thunder Creek within the tract's general analysis area. Therefore, leasing the West Hilight Field LBA Tract would not result in any direct or indirect effects to nesting burrowing owls. Both USFS Standards and Guidelines (USFS 2002) and the Black Thunder Mine's mine permit (TBCC 2005) stipulate that clearance surveys will be conducted and approved by the appropriate agencies before any colony is disturbed during the breeding season. That process will preclude most direct impacts to new nesting burrowing owls in that area.

Because burrowing owls are active during daylight hours, the most probable source of direct impacts would be the death of, or injury to, individuals fleeing heavy equipment, or being killed or injured by equipment while feeding or moving through the mine area. Burrowing owls are generally tolerant of human activities, but increased presence and noise, especially during the nest initiation period, may displace individuals or inhibit nesting proximate to mine operations. Foraging could also be hindered within these areas, especially where mining activities occur near prairie dog colonies.

As described previously, mining could eventually disturb or eliminate prairie dog colonies (potential nesting habitat) on USFS lands in the West Hilight Field tract's general analysis area (approximately 89 acres). However, the limited presence or long-term absence of nesting burrowing owls in that colony, in combination with the presence of other non-disturbed colonies in the area and the ability for prairie dogs to recolonize reclamation, would mitigate those losses to a large extent. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (rodents, non-flying insects) for burrowing owls. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

Additionally, the tendency of prairie dogs to quickly colonize nearby areas when their colonies are disturbed would create new nesting habitat for burrowing owls. Overall, nesting and foraging habitats will be incrementally affected by a variety of large-and small-scale operations. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area as mining operations progress, thus providing opportunities for burrowing owls to relocate to other suitable habitat within the immediate area.

Reclamation will proceed incrementally as areas are mined and activities move to new locations within the mine area. Both activities will create loose soil that should be attractive to dispersing prairie dogs (potential habitat source), at least in the short term. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine, and will eventually mitigate habitat impacts to some degree. However, to date, burrowing owls have rarely been documented nesting within reclaimed habitats at surface mines in the PRB of northeast Wyoming.

If nesting burrowing owls are documented on or near USFS lands in the West Hilight Field LBA Tract, USFS Standards and Guidelines applicable to this species would be implemented on applicable lands to offer additional protections beyond those outlined in the USFWS approved Raptor Mitigation Plan for the Black Thunder Mine. Annual monitoring of known burrowing owl nest sites within the 2-mile wildlife survey area for the mine, including USFS and adjacent lands, and other nearby colonies will continue through the life of the mine to document their histories of occupancy and production.

Direct and Indirect Effects – North Porcupine LBA Tract

No known burrowing owl nest sites are present on USFS lands in the general analysis area for the North Porcupine LBA Tract. However, leasing the North Porcupine LBA Tract could result in direct or indirect effects on two nest sites located within 0.25 mile of USFS lands in that tract; one of which is within the tract's general analysis area itself, while the other is located immediately east of the tract's general analysis area (Figure H-4). That distance represents the USFS buffer for this species. Most nesting has occurred in prairie dog colonies in or near the tract's general analysis area, though badger burrows have also been used. Both USFS Standards and Guidelines (USFS 2002) and the North Antelope Rochelle Mine's mine permit (PRC 2004) stipulate that clearance surveys will be conducted and approved by the appropriate agencies before any colony is disturbed during the breeding season. That process will preclude most direct impacts to new nesting burrowing owls in that area.

Due to the strong (but not exclusive) relationship between burrowing owls and prairie dog colonies, many of the indirect effects described above for the black-tailed prairie dog would also apply to burrowing owls and, thus, will not be repeated in full detail here. Because burrowing owls are active during daylight hours, the most probable source of direct impacts would be the death of, or injury to, individuals fleeing heavy equipment, or being killed or injured by equipment while feeding or moving through the mine area. Burrowing owls are generally tolerant of human activities, but increased presence and noise, especially during the nest initiation period, may displace individuals or inhibit nesting proximate to mine operations. Foraging could also be hindered within these areas, especially where mining activities occur near prairie dog colonies.

As described previously, only one prairie dog colony (approximately 18.6 acres in size) is present on non-federal lands in the North Porcupine tract general

analysis area. Prairie dog colonies located within the existing North Antelope Rochelle Mine permit area could be impacted by mining operations regardless of whether the North Porcupine LBA Tract is leased. If the North Porcupine tract is leased, mining could eventually disturb or eliminate the prairie dog colony (potential nesting habitat) in the tract's general analysis area. Mining could eventually disturb or eliminate prairie dog colonies on adjacent lands in or within 0.25 mile of the North Porcupine tract's general analysis area. However, the generally limited presence of active burrowing owl nests, in combination with the presence of other non-disturbed colonies in the general vicinity and the ability for prairie dogs to recolonize reclamation, would mitigate those losses to a large extent. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (rodents, non-flying insects) for burrowing owls. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

Additionally, the tendency of prairie dogs to quickly colonize nearby areas when their colonies are disturbed would create new nesting habitat for burrowing owls. Overall, nesting and foraging habitats will be incrementally affected by a variety of large-and small-scale operations. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area as mining operations progress, thus providing opportunities for burrowing owls to relocate to other suitable habitat within the immediate area.

Reclamation will proceed incrementally as areas are mined and activities move to new locations within the mine area. Both activities will create loose soil that should be attractive to dispersing prairie dogs (potential habitat source), at least in the short term. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine, and will eventually mitigate habitat impacts to some degree. However, to date, burrowing owls have rarely been documented nesting within reclaimed habitats at surface mines in the PRB of northeast Wyoming.

If nesting burrowing owls are documented on or near USFS lands in the North Porcupine LBA Tract, USFS Standards and Guidelines applicable to this species would be implemented on applicable lands to offer additional protections beyond those outlined in the USFWS approved Raptor Mitigation Plan for the North Antelope Rochelle Mine. Annual monitoring of known burrowing owl nest sites within the 2-mile wildlife survey area for the mine, including USFS and adjacent lands, and other nearby colonies will continue through the life of the mine to document their histories of occupancy and production.

<u>Direct and Indirect Effects – South Porcupine LBA Tract</u>
No known burrowing owl nest sites are present on USFS lands in the general analysis area for the South Porcupine LBA Tract. Most nesting has occurred in prairie dog colonies near each general analysis area, though badger burrows

have also been used. Both USFS Standards and Guidelines (USFS 2002) and the North Antelope Rochelle Mine's mine permit (PRC 2004) stipulate that clearance surveys will be conducted and approved by the appropriate agencies before any colony is disturbed during the breeding season. That process will preclude most direct impacts to new nesting burrowing owls in that area.

Due to the strong (but not exclusive) relationship between burrowing owls and prairie dog colonies, many of the indirect effects described above for the black-tailed prairie dog would also apply to burrowing owls and, thus, will not be repeated in full detail here. Because burrowing owls are active during daylight hours, the most probable source of direct impacts would be the death of, or injury to, individuals fleeing heavy equipment, or being killed or injured by equipment while feeding or moving through the mine area. Burrowing owls are generally tolerant of human activities, but increased presence and noise, especially during the nest initiation period, may displace individuals or inhibit nesting proximate to mine operations. Foraging could also be hindered within these areas, especially where mining activities occur near prairie dog colonies.

As described previously, no prairie dog colonies (potential burrowing owl nesting habitat) are present in the general analysis area for the South Porcupine LBA Tract. Two colonies are however located within approximately 0.25 mile of the South Porcupine tract's general analysis area, both of which are within North Antelope Rochelle Mine's existing permit area, and mining could eventually disturb or eliminate those colonies regardless of whether the South Porcupine LBA Tract is leased. However, the generally limited presence of active nests, in combination with the presence of other non-disturbed colonies in the area and the ability for prairie dogs to recolonize reclamation, would mitigate those losses to a large extent. Surface disturbing activities could also result in a short-term, localized decrease in the prey base (rodents, non-flying insects) for burrowing owls. However, due to their high reproductive potential and tendencies to re-populate and adapt to disturbed and reclaimed areas, prey numbers should increase quickly after the disturbance.

Additionally, the tendency of prairie dogs to quickly colonize nearby areas when their colonies are disturbed would create new nesting habitat for burrowing owls. Overall, nesting and foraging habitats will be incrementally affected by a variety of large-and small-scale operations. The type, timing, location, and extent of habitat disturbance will vary throughout the general analysis area as mining operations progress, thus providing opportunities for burrowing owls to relocate to other suitable habitat within the immediate area.

Reclamation will proceed incrementally as areas are mined and activities move to new locations within the mine area. Both activities will create loose soil that should be attractive to dispersing prairie dogs (potential habitat source), at least in the short term. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine, and will eventually mitigate habitat impacts to some degree. However, to date,

burrowing owls have rarely been documented nesting within reclaimed habitats at surface mines in the PRB of northeast Wyoming.

If nesting burrowing owls are documented on or near USFS lands in the South Porcupine LBA Tract, USFS Standards and Guidelines applicable to this species would be implemented on applicable lands to offer additional protections beyond those outlined in the USFWS approved Raptor Mitigation Plan for the North Antelope Rochelle Mine. Annual monitoring of known burrowing owl nest sites within the 2-mile wildlife survey area for the mine, including USFS and adjacent lands, and other nearby colonies will continue through the life of the mine to document their histories of occupancy and production.

Determination of Effect and Rationale – North Hilight Field LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No burrowing owl nests have been documented on or near USFS lands in the North Hilight Field tract's general analysis area during many years of annual monitoring; only two nests in a single territory are located within the tract's general analysis area. Disturbance, fragmentation, and alteration of foraging and nesting habitats would occur if this tract is leased and mined. However, few prairie dog colonies occur in the general vicinity of this LBA tract, and most are located outside of the tract's general analysis area where future surface disturbance would occur.

The Black Thunder Mine has avoided, where possible, and mitigated such impacts in the past through intensive monitoring of both populations and specific nest sites, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests (including burrowing owl nests). Mining activities and noise may disturb individuals inhabiting the lease area, thus inhibiting potential nesting or foraging in proximity to lands with ongoing development. Potential collisions with vehicles might also occur, though none have been recorded in the area to date.

Determination of Effect and Rationale – South Hilight Field LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No burrowing owl nests have been documented on or near USFS lands in the South Hilight Field tract's general analysis area during many years of annual monitoring, nor have any nests been located within the tract's general analysis area itself. Few prairie dog colonies occur in the general vicinity of this LBA tract, and most are located outside of the tract's general analysis area where future surface disturbance would occur.

The Black Thunder Mine has avoided, where possible, and mitigated such impacts in the past through intensive monitoring of both populations and

specific nest sites, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests (including burrowing owl nests). Mining activities and noise may disturb individuals inhabiting the lease area, thus inhibiting potential nesting or foraging in proximity to lands with ongoing development. Potential collisions with vehicles might also occur, though none have been recorded in the area to date.

Determination of Effect and Rationale – West Hilight Field LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No burrowing owl nests have been documented on USFS lands in the West Hilight Field tract's general analysis area during many years of annual monitoring, and only a single nest site is located approximately 0.25 mile from the nearest USFS lands in the tract's general analysis area. Disturbance, fragmentation, and alteration of foraging and nesting habitats would occur if this tract is leased and mined. However, excluding the single large colony that is located in the tract's general analysis area, few prairie dog colonies occur in the general vicinity of this LBA tract, and most are located outside of the tract's general analysis area.

The Black Thunder Mine has avoided, where possible, and mitigated such impacts in the past through intensive monitoring of both populations and specific nest sites, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests (including burrowing owl nests). Mining activities and noise may disturb individuals inhabiting the lease area, thus inhibiting potential nesting or foraging in proximity to lands with ongoing development. Potential collisions with vehicles might also occur, though none have been recorded in the area to date.

Determination of Effect and Rationale – North Porcupine LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No burrowing owl nests have been documented on USFS lands in the North Porcupine tract's general analysis area during many years of annual monitoring. A single nest site is located in the only prairie dog colony that is within the tract's general analysis area, and that nest site is immediately adjacent to USFS lands. Disturbance, fragmentation, and alteration of foraging and nesting habitats would occur if this tract is leased and mined. However, most of the prairie dog colonies in the general vicinity are located outside of the tract's general analysis area where future surface disturbance associated with this leasing action would occur.

The North Antelope Rochelle Mine has avoided, where possible, and mitigated such impacts in the past through intensive monitoring of both populations and specific nest sites, implementation of USFWS approved mitigation measures,

and adjusting operations to provide temporal and spatial buffers around raptor nests (including burrowing owl nests). Mining activities and noise may disturb individuals inhabiting the lease area, thus inhibiting potential nesting or foraging in proximity to lands with ongoing development. Potential collisions with vehicles might also occur, though none have been recorded in the area to date.

Determination of Effect and Rationale – South Porcupine LBA Tract
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No burrowing owl nests have been documented on or within 0.25 mile of USFS lands in the general analysis area for the South Porcupine LBA Tract during many years of annual monitoring. Most prairie dog colonies in the general vicinity are located outside of the tract's general analysis area where future surface disturbance associated with this leasing action would occur.

The North Antelope Rochelle Mine has avoided, where possible, and mitigated impacts in the past through intensive monitoring of both populations and specific nest sites, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests (including burrowing owl nests). Mining activities and noise may disturb individuals inhabiting the lease area, thus inhibiting potential nesting or foraging in proximity to lands with ongoing development. Potential collisions with vehicles might also occur, though none have been recorded in the area to date.

H-3.2.24 Chestnut-collared longspur (*Calcarius ornatus*)

The breeding range of the chestnut-collared longspur extends from southern Alberta to southern Manitoba, south to west-central Colorado, and east through North Dakota and South Dakota to western Minnesota (Dechant et al. 2003b). The chestnut-collared longspur is a common summer resident of the eastern plains of Wyoming (Cerovski et al. 2004). This species prefers native grasslands as breeding sites, inhabiting open prairie and avoiding excessively shrubby areas. Grasslands with dense litter accumulations are also avoided (Dechant et al. 2003b). Scattered shrubs are often used as singing perches. Nests are typically placed in areas of sparse vegetation (less than 50-75 inches or 20-30 centimeters), but usually with a taller grass component than sites preferred by McCown's longspurs. Nests are on the ground in depressions and often placed beside cattle dung, small shrubs, or under a clump of grass (Hill and Gould 1997). Male fidelity to breeding areas has been observed. Chestnut-collared longspurs feed primarily on seeds (especially grasses), insects, and spiders. This species is generally tolerant of short-term intrusion at the nest site but may desert if disturbed during nest building or egg-laying (Hill and Gould 1997). High rates of predation on eggs and nestlings have been reported and pesticides have been shown to reduce hatching success. The chestnut-collared longspur breeding range has contracted and long-term data

suggests population declines (Hill and Gould 1997). These declines have been attributed to loss of native prairie habitat, and conversion to cropland and urban development.

Existing Conditions – North, South and West Hilight Field LBA Tracts

Chestnut-collared longspurs are common summer residents within the TBNG. This species has not been recorded on USFS lands or other lands in the North or South Hilight Field tracts' general analysis areas during annual monitoring in recent years. Individuals of this species were recorded infrequently on non-federal lands in the West Hilight Field tract's general analysis area during annual monitoring in recent years. As described previously, sagebrush habitats dominate USFS and adjacent lands in the general analysis areas for the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts. Grassland areas are present in the form of upland grasslands, agricultural pasture grasslands, and within prairie dog colonies, but they occur in isolated parcels scattered throughout the area rather than in contiguous and/or sizeable blocks that would be attractive to nesting chestnut-collared longspurs. Consequently, only limited suitable habitat conditions exist for this species on USFS lands in the North Hilight Field, South Hilight Field and West Hilight Field LBA Tracts' general analysis areas and adjacent lands.

Existing Conditions – North and South Porcupine LBA Tracts

Chestnut-collared longspurs are common summer residents within the TBNG. This species has not been recorded on USFS or adjacent lands in the North and South Porcupine tract's general analysis area during annual monitoring conducted in recent years.

The North Porcupine tract's general analysis area is dominated by sagebrush communities. Potential habitat in that area is largely restricted to the western extent, west of the Antelope Road (Figure H-4). The South Porcupine tract's general analysis area is dominated by various native and introduced grassland species. Therefore, the general analysis area for the South Porcupine LBA Tract is considered suitable habitat for this species.

Direct and Indirect Effects

Due to the similarity of potential impacts from future mining on chestnut-collared longspurs and other grassland species previously discussed (e.g., prairie dog and swift fox), detailed descriptions of those impacts are not repeated here. Chestnut-collared longspurs have not been documented as nesting in the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine tracts' general analysis areas. Individuals of this species have been documented on non-federal surface in the larger South Porcupine 2-mile wildlife survey area (Figure H-5); which was presumed due to observations of breeding displays. Equipment operations associated with future mining operations could result in fatalities or injury to individuals, nests and eggs, and/or young. Increased human activity and noise could inhibit foraging or nesting within suitable habitats on USFS lands or displace

individuals during periods of intense activities. Over the life of the mine, potential nesting and foraging habitats in the general analysis areas could be disturbed, destroyed, altered, or fragmented, though the type, timing, location, and extent of habitat disturbance will vary throughout the general analysis areas as mining operations progress. Reclamation of disturbed areas will occur incrementally as resources are extracted in a given portion of the mine. Within 1 to 2 years, newly reclaimed areas may create good quality, short-duration nesting habitat for chestnut-collared longspurs. However, as these sites mature, they would become less suitable as nesting habitat for this species.

Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. USFS lands in the North Hilight Field, South Hilight Field and West Hilight Field tracts' general analysis areas are dominated by sagebrush communities that are not as attractive to grassland species such as the longspur. No individuals have been documented in the general analysis areas for the North Hilight Field and South Hilight Field tracts, and only limited observations of individuals have occurred in the West Hilight Field tract's general analysis area. Potential and documented alternative habitats for chestnut-collared longspurs are present elsewhere in the vicinity in areas not currently scheduled for mining disturbance.

Determination of Effect and Rationale – North and South Porcupine LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Sagebrush dominated areas such as those on USFS and adjacent lands within the North Porcupine tract's general analysis area are not as attractive to grassland species such as longspurs. The grasslands in the South Porcupine tract's general analysis area are more likely to attract these birds than the sagebrush-dominated areas that typically occur in the general Wright analysis area. No individuals have been documented in the North and South Porcupine tracts' general analysis areas or surrounding wildlife survey areas. Potential and documented alternative habitats for chestnut-collared longspurs are present elsewhere in the vicinity in areas not currently scheduled for mining disturbance.

H-3.2.25 McCown's Longspur (*Calcarius mccownii*)

McCown's longspurs breed from southern Alberta and southern Saskatchewan, south through Montana, eastern and central Wyoming, and north-central Colorado, and east to western Nebraska, north-central South Dakota, and southwestern North Dakota (Dechant et al. 2003c). This species is a common summer resident of the eastern plains and great basin-foothills grasslands, basin-prairie shrublands, and agricultural areas throughout most of Wyoming (Cerovski et al. 2004). Specifically, this species requires open habitats such as sparsely vegetated, low structured grasslands, and heavily grazed pastures

containing a moderate bare ground component for nesting and foraging. Nest sites are typically a natural or shallow scraped depression on the ground placed in the open or beside vegetation such as bunch grasses, cacti, or shrubs. McCown's longspurs feed on seeds of grasses and forbs, insects, and other arthropods. No strong data suggests breeding site fidelity although some individuals may return to the general nesting area in subsequent years.

Individuals vary in response to human intrusion at nest sites, but appear to be relatively more tolerant than most grassland songbird species. High rates of predation on eggs and nestlings occur especially where nests are associated with vegetative structure. Nestlings may also be directly poisoned where insecticides are sprayed in nest areas (With 1994). Populations are declining, especially within the northern portion of the range. Factors directly affecting the McCown's longspur include the reduction of breeding habitat due to overgrazing, control of prairie fires, plowing, development, and excessive use of pesticides. Conversion of short-grass prairie to agriculture and urban development is the most important factor (With 1994).

Existing Conditions – North, South and West Hilight Field LBA Tracts

McCown's longspurs are also common summer residents within the TBNG. Observations of the McCown's longspur mirror those of the chestnut-collared longspur. Neither species has been documented in either the North or South Hilight Field tracts' general analysis areas, and limited sightings of individual birds have been recorded in the West Hilight Field tract's general analysis area in recent years, although no confirmed observations of this species were made on USFS lands in that area. The nearest observation to this general area occurred on non-federal lands in NE¼SW¼ Section 13, T.43N., R.71W. in May 2000. The height and composition of vegetation (i.e., sagebrush) on most USFS lands in the North, South and West Hilight Field tracts' general analysis areas is generally too tall and dense to provide suitable habitat for McCown's longspurs.

Existing Conditions – North and South Porcupine LBA Tracts

This species has not been observed on USFS or adjacent lands in the sagebrush dominated North Porcupine tract's general analysis area or its wildlife survey area. McCown's longspurs were not recorded on USFS lands in the grassland dominated South Porcupine tract's general analysis area, but individuals have been seen occasionally on non-federal lands in and near that area. This species is regularly observed in prairie dog colonies at the neighboring Antelope Mine.

Direct and Indirect Effects

The direct and indirect effects to McCown's longspurs would be the same as those described above for the chestnut-collared longspur.

Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. USFS lands in the North Hilight Field, South Hilight Field and West Hilight Field tracts' general analysis areas are dominated by sagebrush communities that are not as attractive to grassland species such as the longspur. No individuals have been documented in the general analysis areas for the North Hilight Field and South Hilight Field tracts, and only limited observations of individuals have been recorded in the West Hilight Field tract's general analysis area. Potential and documented alternative habitats for McCown's longspurs are present nearby in more appropriate habitats not currently scheduled for mining disturbance.

Determination of Effect and Rationale – North and South Porcupine LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Potential impacts to McCown's longspurs would be the same as those described above for the chestnut-collared longspur in the North and South Porcupine tracts' general analysis areas. However, as reclaimed grasslands mature, they would become less suitable as nesting habitat for this short-grass species.

H-3.2.26 Greater sage-grouse (*Centrocercus urophasianus*)

The Greater sage-grouse occurs year-round throughout non-forested regions of Wyoming (Cerovski et al. 2004). Sage-grouse 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 usually in open areas (playas, ridge tops, sparse sagebrush, or burned areas) that are surrounded by dense sagebrush and escape cover. The surrounding area also typically represents nesting, loafing, and foraging habitat.

After being bred, hens typically scratch out a nest under sagebrush (Connelly et al. 1991) within three kilometers of the lek (Schroeder et al. 1999). Nests in some portions of sage-grouse range are typically placed under sagebrush with average height of 36-79 centimeters (Schroeder et al. 1999). However, research conducted within the Southern PRB (Brown and Clayton 2004) indicated that, although shorter sagebrush was present at nest sites, grouse selected shrubs ranging from 55-61 centimeters in height under which to place nests. Re-nesting may occur if the nest is destroyed early during the laying or incubation period. Nest success is enhanced where both sagebrush and residual grass cover are taller and denser (Gregg et al. 1994). 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 relatively 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, exposed sagebrush. Where snow accumulations are significant, gentle south- and west-facing slopes or windblown ridges are preferred.

Breeding populations of this species have declined by at least 17 to 47 percent throughout much of its range (Connelly et al. 2004). Within Wyoming, sage-grouse populations have generally declined over the past 4 decades. However, sage-grouse population estimates specifically pertaining to the TBNG suggest an overall increase in individuals since 1995. This same general trend was observed both statewide and within the Northeast Wyoming Sage-Grouse Local Working Group (NWSGWG) area.

The NWSGWG identified habitat fragmentation and degradation, disturbance and direct mortality as major influences affecting sage-grouse (NWSGWG 2006). The group identified oil and gas development, vegetation management, invasive plants, and weather as those factors with the most influence on the northeast Wyoming sage-grouse populations and those that may most effectively be addressed to provide the greatest benefit for sage-grouse conservation in northeast Wyoming (NWSGWG 2006).

Existing Conditions – North, South and West Hilight Field LBA Tracts

As described above, USFS lands on and adjacent to the general analysis areas for the North, South, and West Hilight Field LBA Tracts are dominated by a sagebrush-grassland community, primarily big sagebrush, with shrub cover ranging from 55 to 60 percent. Those areas provide potential year-round habitat for sage-grouse, though habitat quality varies. Sagebrush stands range from sparse to moderately dense throughout the areas, with only a marginal grassy understory in many areas.

Despite the prevalence of sagebrush in the combined wildlife survey areas for the North, South and West Hilight Field LBA Tracts, sage-grouse numbers were never especially high in the area. Five sage-grouse leks are located on and within 2 miles of the North, South, and West Hilight Field tracts' general analysis areas: Stuart I, Stuart II, Black Thunder, Butch, and Hansen Lakes (Figures H-1, H-2 and H-3).

No sage-grouse leks are present on USFS lands in the North Hilight Field tract's general analysis area. Two leks are present on non-federal surface in the tract's general analysis area: Butch and Hansen Lakes. The Hansen Lakes lek is immediately south of USFS surface in that area (Figure H-1). The

Hansen Lakes lek is classified as "occupied" by the WGFD (active in at least 1 of the last 10 years). The Butch lek was first recorded in 1990. The peak male count (15) occurred in 1991, after which numbers declined dramatically. No grouse were recorded at the Butch lek during annual checks conducted over the last 14 years (1994 through 2007). The Butch lek is classified as "unoccupied/abandoned" by the WGFD (no activity for 10 consecutive years).

The Butch lek was discovered in 1990, and was active every year through 1993. The Hansen Lakes lek was discovered in 1993, coincidently at the same time peak male counts were dramatically declining at the Butch lek; the leks are approximately 1.5 miles apart. Peak male counts at the Hansen Lakes lek ranged from 14 to 24 birds from 1993 through 2000, but dropped markedly to only 3 birds in 2001. Grouse were present at the lek for the next 2 years, but no birds were observed there after 2003. No other grouse leks are present within 3 miles of the North Hilight Field tract's general analysis area. The next nearest lek is the Stuart II lek, approximately 4.1 miles southwest of the North Hilight Field tract's general analysis area (Figure H-1).

No sage-grouse leks are present on USFS lands in the general analysis area for the South Hilight Field LBA Tract or within that tract's 2-mile wildlife survey area (Figure H-2). Likewise, no lek sites have been documented on non-federal surface in South Hilight Field tract's general analysis area. The former Black Thunder lek was located on non-federal surface approximately 1 mile east of the South Hilight Field tract's general analysis area. The Black Thunder lek was first documented in 1984, when a peak male count of 21 was recorded. Grouse numbers gradually declined over the next several years of annual monitoring, with only one bird observed at the lek in 1993. No grouse were recorded at the Black Thunder lek during annual checks conducted over the subsequent 12 years (1994 through 2005), prior to any mine-related disturbance occurring within several miles. Due to the consistently low counts, WGFD authorized the mine to reduce searches for grouse leks in the permit area and 1-mile perimeter to every third year beginning in 2004 (i.e., 2004, 2007, etc.). That lek was classified as "unoccupied/abandoned" after 10 consecutive years of inactivity, and it was then impacted by topsoil stripping in 2007 and is now officially classified as "unoccupied/destroyed" by WGFD. The Stuart II lek is located on USFS lands approximately 3 miles northwest of the tract's general analysis area (Figure H-2).

The Stuart II lek lies within the general analysis area for the West Hilight Field LBA Tract (Figure H-3), and is the only lek on USFS lands in the combined wildlife survey areas for the three Hilight Field LBA Tracts. Two leks are present on non-federal surface in the vicinity of the West Hilight Field area. The Stuart I lek is approximately 1.25 miles west of the tract's general analysis area, and the next nearest lek is the former Black Thunder site, approximately 2.25 miles east of the tract's general analysis area (Figure H-3).

The Stuart I lek was first recorded in 1977. The peak male count (29) occurred in 1979, with reduced numbers in the subsequent 2 years. The lek was

monitored by the WGFD at approximately 3-year intervals from 1982 through 2003; annual monitoring was conducted by private consultants for unrelated projects each year from 2004 through 2007. Grouse were observed at the lek during only 1 of the 11 survey years from 1982 through 2007. The last sighting occurred in 1991, when two males were recorded at the Stuart I lek. The Stuart II lek was discovered in 1979. Few grouse were seen at the lek over the next 28 years, with a maximum of seven males observed in any survey year. The Stuart II lek was also surveyed primarily at 3-year intervals since its discovery, with annual checks conducted from 2005 through 2007. Because the two Stuart leks were not monitored annually, their management status is "undetermined," despite consistently low counts when surveys did occur.

Grouse counts at these five leks in the combined wildlife survey areas for the North, South and West Hilight Field LBA Tracts were consistently low since their respective discoveries, with few birds observed at any location in the last 7 to 20 years, depending on the lek site. Additionally, records from the WGFD (obtained from D. Thiele, Regional Biologist, WGFD, Buffalo, Wyoming), and USFS have not documented any new sage-grouse leks within the approximately 131 square mile area that encompasses the combined wildlife survey areas for the three Hilight Field LBA Tracts. Telemetry data collected on radio-collared grouse at the nearby North Antelope Rochelle Mine throughout the last 7 years (2001-2007) shows no sage-grouse locations within several miles of the three Hilight Field LBA Tracts during that period (Brown and Clayton 2004, North Antelope Rochelle Mine Annual Wildlife Report 2006, 2007). It is important to note that the reduction in grouse attendance at these five leks, and most others in the PRB, preceded physical mining disturbance and, thus, cannot be directly attributable to mine-related activities (Orpet 2007, McKee 2007). Annual counts for each lek are available in annual monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

Annual surveys for sage-grouse broods were conducted in native and reclaimed stream channels at and around the Black Thunder Mine from 1994 through 1999; such surveys were no longer required by WGFD and WDEQ/LQD after that year due to the consistent lack of grouse broods at coal mines throughout the PRB. No new leks or broods were seen during recent baseline inventories conducted for the three Hilight Field LBA Tracts. All grouse broods that have been recorded over the years occurred as incidental sightings during other wildlife surveys.

Areas of suitable habitat for nesting and strutting grounds are widely known as necessary to sustain sage-grouse populations. One recent study suggests that availability of winter habitat may also affect sage-grouse populations (Naugle et al. 2006). Nesting and winter surveys for sage-grouse are not required as part of the annual wildlife programs for the Black Thunder Mine or other applicant mines discussed in this EIS, though winter surveys have been conducted as part of baseline inventories for previous mine expansions. Additionally, periodic winter surveys for other species (i.e., big game, bald eagle roosts) have

occurred at all three applicant mines in recent years. Due to their proximity to existing mine permit areas, most USFS lands in the North and South Hilight Field tracts' general analysis areas, and those in the eastern half of the West Hilight Field tract's general analysis area, have been included in a minimum of seven consecutive years (big game surveys 1993-1999) of some level of winter surveys, with additional surveys conducted in some subsequent years. No sage-grouse were ever documented in or near those LBA tracts during those winter surveys.

Existing Conditions – North Porcupine LBA Tract

As described above, USFS lands on and adjacent to the general analysis area for the North Porcupine LBA Tract are dominated by a sagebrush-grassland community, primarily big sagebrush, with shrub cover averaging 54 percent in that area. The North Antelope Rochelle Mine, as part of its wildlife monitoring program from 1984 through 1992, conducted voluntary searches for and annual monitoring of sage-grouse leks throughout the mine's original permit area and a 1-mile perimeter. Those surveys became mandatory with the implementation of Appendix B of the WDEQ/LQD Coal Rules and Regulations in 1993, and continued each year through 2007. Radio-telemetry data gathered from grouse collared at the North Antelope Rochelle Mine during a voluntary, multi-year (2001 through 2007) study have demonstrated that most birds in the North and South Porcupine LBA Tracts' 2-mile wildlife survey areas (Figures H-4 and H-5) reside near the mine year-round. Additional details describing the survey and monitoring efforts for sage-grouse at the North Antelope Rochelle Mine are available in annual wildlife monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

Five sage-grouse leks are located within 2 miles of the North Porcupine tract's general analysis area: Payne, Wilson, Rochelle, Kort I, and Kort II (Figure H-4). The Payne and Kort 1 leks are on USFS lands, but only the Payne lek is actually within the LBA tract's general analysis area itself. These five leks are collectively referred to as the Rochelle Complex. The birds in that complex comprise approximately 4 percent of the grouse population in the entire TBNG, and approximately 17 percent of the population in the Hilight Bill Geographic Area.

The Payne lek was first discovered in spring 2001. The peak male count (21) recorded that year was higher than that of any subsequent year. Grouse counts at the Payne lek have fluctuated over the last 7 years, with numbers increasing each year from 2005 through 2007. The average annual peak count for males at the Payne lek since its discovery was 10.5. The Payne lek is currently classified as "occupied."

The Wilson lek has been unoccupied for the last 10 consecutive years, and is therefore considered "unoccupied/abandoned."

The Rochelle lek was discovered in 1990 but experienced reduced attendance after 1992, with birds present in only 3 of the subsequent 11 years. The site may have been a satellite to the Wilson lek, used only when the local grouse population was relatively high or increasing. The Rochelle lek was mined through in 2004, and is now classified as "unoccupied/destroyed."

The Kort I lek was first identified in spring 1998 when, for unknown reasons, grouse apparently shifted their breeding activities from the Wilson lek. Male attendance at the Kort I lek gradually declined through 2004 (low of three males), and the birds shifted their display location to the Kort II lek site in 2005. The average peak male count for the Kort leks since their discovery was 5.2 males per year. The Kort I and Kort II leks are currently classified as "occupied."

Although sage-grouse numbers have generally been low in the combined North and South Porcupine tracts' wildlife survey areas over the years, known or potential grouse habitat is present in both areas. However, the most suitable sage-grouse habitat exists in the North Porcupine area, as suggested by the distribution of grouse leks between the two areas and confirmed through the information gleaned from the last 7 years of radio-telemetry data collected in the general vicinity. Results from that project have demonstrated that grouse are most commonly recorded in the eastern quarter of the 2-mile wildlife survey area for the North Porcupine LBA Tract, east of the Payne County Road. Detailed reports and long-term maps documenting grouse locations in the area have been submitted to WDEQ/LQD and other agencies in each study year.

Annual surveys for sage-grouse broods were conducted in native and reclaimed stream channels at the North Antelope Rochelle Mine and adjacent mines from 1994 through 1999; such surveys were no longer required by WGFD and WDEQ/LQD after that year due to the consistent lack of grouse broods observed at coal mines throughout the PRB. Likewise, no sage-grouse broods were seen during recent baseline inventories conducted for the North and South Porcupine LBA Tracts. All grouse broods that have been recorded over the years occurred as incidental sightings during other wildlife surveys.

Nesting and winter surveys for sage-grouse are not required as part of the annual wildlife programs for the North Antelope Rochelle or the other applicant mines included in this EIS (Black Thunder and Jacobs Ranch), though winter surveys have been conducted as part of baseline inventories for previous mine expansions. Additionally, winter surveys for other species (big game and bald eagle roosts) have occurred at all three of these mines in recent years. Due to their proximity to existing mine permit areas, nearly all of the combined North and South Porcupine tracts' general analysis areas have been included in some level of regular (but not always annual) winter surveys since 1987. No sage-grouse were ever documented in or near these two LBA tracts during those surveys. However, grouse have been confirmed as year-round residents in the vicinity of the North Porcupine tract general analysis area during year-round telemetry studies conducted from 2001 through 2005, with less frequent

monitoring during the subsequent two winters. Only isolated grouse sightings occurred within 3 miles of the South Porcupine tract general analysis area during that telemetry monitoring period, with each sighting limited to a single observation per bird.

Existing Conditions – South Porcupine LBA Tract

As described previously, USFS lands on the general analysis area for the South Porcupine LBA Tract are dominated by various native and introduced grassland species. The North Antelope Rochelle Mine, as part of its wildlife monitoring program from 1984 through 1992, conducted voluntary searches for and annual monitoring of sage-grouse leks throughout the mine's original permit area and a 1-mile perimeter. Those surveys became mandatory with the implementation of Appendix B of the WDEQ/LQD Coal Rules and Regulations in 1993, and continued each year through 2007. Radio-telemetry data gathered from grouse collared at the North Antelope Rochelle Mine during a voluntary, multi-year (2001 through 2007) study have demonstrated that most birds in the North and South Porcupine LBA Tracts' 2-mile wildlife survey areas (Figures H-4 and H-5) reside near the mine year-round. Additional details describing the survey and monitoring efforts for sage-grouse at the North Antelope Rochelle Mine are available in annual wildlife monitoring and baseline wildlife reports on file at the USFS Douglas Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne.

No sage-grouse leks have been documented on or within 3 miles of the South Porcupine tract's general analysis area (Figure H-5). The Payne lek, which is nearly 5 miles to the northeast, is the closest sage-grouse lek to the South Porcupine tract's general analysis area.

Although sage-grouse numbers have generally been low in the combined North and South Porcupine tracts' wildlife survey areas over the years, known or potential grouse habitat is present in both areas. However, the most suitable sage-grouse habitat exists in the North Porcupine area, as suggested by the distribution of grouse leks between the two areas and confirmed through the information gleaned from the last 7 years of radio-telemetry data collected in the general vicinity. Results from that project have demonstrated that grouse are most commonly recorded in the eastern quarter of the 2-mile wildlife survey area for the North Porcupine LBA Tract, east of the Payne County Road. Detailed reports and long-term maps documenting grouse locations in the area have been submitted to WDEQ/LQD and other agencies in each study year.

Annual surveys for sage-grouse broods were conducted in native and reclaimed stream channels at the North Antelope Rochelle Mine and adjacent mines from 1994 through 1999; such surveys were no longer required by WGFD and WDEQ/LQD after that year due to the consistent lack of grouse broods observed at coal mines throughout the PRB. Likewise, no sage-grouse broods were seen during recent baseline inventories conducted for the North and

South Porcupine LBA Tracts. All grouse broods that have been recorded over the years occurred as incidental sightings during other wildlife surveys.

Nesting and winter surveys for sage-grouse are not required as part of the annual wildlife programs for the North Antelope Rochelle or the other applicant mines included in this EIS (Black Thunder and Jacobs Ranch), though winter surveys have been conducted as part of baseline inventories for previous mine expansions. Additionally, winter surveys for other species (big game and bald eagle roosts) have occurred at all three of these mines in recent years. Due to their proximity to existing mine permit areas, nearly all of the combined North and South Porcupine tracts' general analysis areas have been included in some level of regular (but not always annual) winter surveys since 1987. No sage-grouse were ever documented in or near these two LBA tracts during those surveys. However, grouse have been confirmed as year-round residents in the vicinity of the North Porcupine general analysis area during year-round telemetry studies conducted from 2001 through 2005, with less frequent monitoring during the subsequent two winters. Only isolated grouse sightings occurred within 3 miles of the South Porcupine general analysis area during that telemetry monitoring period, with each sighting limited to a single observation per bird.

Direct and Indirect Effects – North, South and West Hilight Field LBA Tracts

Three of the five sage-grouse leks located in the combined wildlife survey areas for the three Hilight Field LBA Tracts occur in an area likely to be disturbed by future mining, if the three proposed leasing actions are approved. One lek (Stuart II in the West Hilight Field tract's general analysis area) is on USFS lands and the other two (Hansen Lakes and Butch) are on non-federal surface in the North Hilight Field tract's general analysis area.

Due to the consistently low number of sage-grouse documented in these LBA tracts' wildlife survey areas over the last 3 decades, despite the presence of apparently suitable habitat, leasing and mining USFS lands and adjacent lands within the general analysis areas for the North, South, and West Hilight Field LBA Tracts would have limited effects on individual birds. Some potential impacts of mineral development (including coal mining and oil and gas development) on sage-grouse that might inhabit the area, as well as on known and potential sage-grouse habitat include: alteration of plant and animal communities; loss or degradation of important seasonal habitats; increased human activity and noise which could cause animals to avoid the area and/or reduce their breeding efficiency; increased road traffic and related injuries or mortalities; increased risk of predation from raptors perched on existing or future power poles and/or grouse avoidance of areas with overhead power lines; potential illegal harvest; and reduced water tables resulting in the loss of herbaceous vegetation. Following reclamation, there may be a long term loss of nesting and winter habitat, depending on the amount of sagebrush that is restored relative to the amount of sagebrush that is present before mining. Sagebrush is a component of both the Sagebrush/Grassland and Big

Sagebrush vegetation communities, which occupy approximately 55 to 60 percent of the combined vegetation analysis areas for the three Hilight Field LBA Tracts. WDEQ/LQD reclamation standards call for restoration of sagebrush on at least 20 percent of the reclaimed area. Estimates for the time it would take to restore shrubs, including sagebrush, to pre-mining density levels range from 20 to 100 years. Until sagebrush returns to its pre-mining density levels, a reduction in potential sage-grouse nesting habitat and winter habitat on the three Hilight Field LBA Tracts would persist.

Due to the documented long-term lack of sage-grouse use on USFS lands and adjacent lands in the North, South, and West Hilight Field tracts' general analysis areas and surrounding wildlife survey areas, USFS Standards and Guidelines (USFS 2002, page 1-18; Appendix D) would have limited applications toward controlling the type, timing, and location of disturbance activities within the three Hilight Field LBA Tract areas. The use of existing roads, when possible, could minimize additional impacts related to traffic hazards and the use of new travel corridors by mammalian predators. Raptor predation does not seem to be a primary source of mortality for the local sage-grouse population (Brown and Clayton 2004). Nevertheless, new overhead power lines could be fitted with perch deterrents to limit opportunities for avian predators to target any grouse that might be in the area. The use of underground power lines to the extent possible would also reduce this risk, and would minimize new vertical structures that could affect grouse use or movements in the area. If precautions are taken to avoid direct mortalities and disturbances to nests and leks during the breeding season, grouse might have the opportunity to disperse away from mine activities.

Mine operations and oil and gas development 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 species and habitats, though reclamation standards are widely variable among industries. New areas disturbed by mining in the general analysis areas for the three Hilight Field LBA Tracts will be reclaimed incrementally, but they may not be attractive to sage-grouse for many years due to slow establishment and growth rates of important sagebrush species. Information gleaned from the multi-year telemetry study at a neighboring coal mine could also be helpful in reclamation efforts for the three Hilight Field LBA Tracts. In the meantime, the presence of known and apparently suitable sage-grouse habitat elsewhere within the immediate area could provide alternate areas for dispersing grouse to use until reclaimed sagebrush stands have matured adequately to support a local population.

In keeping with the Direction Objectives for the Hilight Bill Geographic Area (USFS 2002, page 1-25), impacts to sage-grouse habitat in the general analysis areas for the three Hilight Field LBA Tracts could be further mitigated off-site by efforts to preserve and enhance habitat on adjoining and nearby private lands, such as those currently under way through the Thunder Basin Grasslands Prairie Ecosystem Association. Management planning and

processes that are developed through this combined effort among landowners and federal representatives will presumably provide suitable habitat for sage-grouse that disperse from the three Hilight Field LBA Tracts general analysis areas during the interim between habitat disturbance and completed reclamation.

Should sage-grouse move onto USFS lands analyzed in this EIS in the future, agency Standards and Guidelines would offer appropriate protections for the species and its important habitats. However, under the current conditions, and the documented absence or consistently low presence of this species in the area, mining USFS lands within the North, South, and West Hilight Field LBA Tracts would not adversely impact sage-grouse populations in the region, nor would it conflict with the current TBNG Plan or any future objectives to manage the area for this species.

Direct and Indirect Effects – North Porcupine LBA Tract

Because of their location within the existing permit area for the North Antelope Rochelle Mine, all five sage-grouse leks in the North Porcupine tract's wildlife survey area occur in an area likely to be disturbed by future mining, regardless of whether the proposed leasing action is approved.

Some potential impacts of mineral development (including coal mining and oil and gas development) on sage-grouse that might inhabit the general analysis area for the North Porcupine tract, as well as on known and potential sage-grouse habitat include: alteration of plant and animal communities; loss or degradation of important seasonal habitats; increased human activity and noise, which could cause animals to avoid the area and/or reduce their breeding efficiency; increased road traffic and related injuries or mortalities; increased risk of predation from raptors perched on existing or future power poles and/or grouse avoidance of areas with overhead power lines; potential illegal harvest; and reduced water tables resulting in the loss of herbaceous vegetation. Following reclamation, there may be a long-term loss of nesting and winter habitat, depending on the amount of sagebrush that is restored relative to the amount of sagebrush that is present before mining.

Sagebrush communities occupy approximately 54 percent of the vegetation analysis areas in the North Porcupine LBA Tract. Mine operations and oil and gas development have requirements for reclamation of disturbed areas as recovery of energy resources is completed. WDEQ/LQD reclamation standards for surface coal mines call for restoration of sagebrush on at least 20 percent of the reclaimed area. Those reclamation efforts can work in concert with USFS Standards and Guidelines toward mitigating impacts to wildlife species and habitats. New areas disturbed by mining in the general analysis area for the North Porcupine LBA Tract would be reclaimed incrementally, but they may not be attractive to sage-grouse for many years due to slow establishment and growth rates of important sagebrush species. Information gleaned from the multi-year telemetry study at the North Antelope Rochelle Mine would be

incorporated into reclamation efforts for the LBA tract to maximize successful reclamation of sage-grouse habitat. Estimates for the time it would take to restore shrubs, including sagebrush, to pre-mining density levels range from 20 to 100 years. Until sagebrush returns to its pre-mining density levels, a reduction in potential year-round sage-grouse habitat within the North Porcupine tract's general analysis area would persist. In the meantime, the presence of known and apparently suitable sage-grouse habitat elsewhere within the immediate area could provide alternate areas for dispersing grouse to use until reclaimed sagebrush stands have matured adequately to support a local population.

In keeping with the Direction Objectives for the Hilight Bill Geographic Area (USFS 2002, page 1-25), impacts to sage-grouse habitat in the general analysis area for the North Porcupine LBA Tract could be further mitigated off-site by efforts to preserve and enhance habitat on adjoining and nearby private lands, such as those currently under way through the Thunder Basin Grasslands Prairie Ecosystem Association. Management planning and processes that are developed through this combined effort among landowners and federal representatives will presumably provide suitable habitat for sage-grouse that disperse from the North Porcupine tract and adjacent North Antelope Rochelle Mine areas during the interim between habitat disturbance and completed reclamation. Should sage-grouse move onto new USFS lands proposed for mining in the future, agency Standards and Guidelines would offer appropriate protections for the species and its important habitats.

Despite the impacts to the Rochelle lek complex, the proposed leasing action would not contribute to significant reductions in the regional sage-grouse population overall, nor would it conflict with the current TBNG Plan or any future objectives to manage the area for this species.

Direct and Indirect Effects – South Porcupine LBA Tract

No impacts to sage-grouse are expected for the South Porcupine area due to the documented lack of sage-grouse and suitable sage-grouse habitat in that area.

Some potential impacts of mineral development (including coal mining and oil and gas development) on sage-grouse that might inhabit the general analysis area for the South Porcupine tract, as well as on known and potential sage-grouse habitat include: alteration of plant and animal communities; loss or degradation of important seasonal habitats; increased human activity and noise which could cause animals to avoid the area and/or reduce their breeding efficiency; increased road traffic and related injuries or mortalities; increased risk of predation from raptors perched on existing or future power poles and/or grouse avoidance of areas with overhead power lines; potential illegal harvest; and reduced water tables resulting in the loss of herbaceous vegetation. Following reclamation, there may be a long-term loss of nesting

and winter habitat, depending on the amount of sagebrush that is restored relative to the amount of sagebrush that is present before mining.

Mine operations and oil and gas development have requirements for reclamation of disturbed areas as recovery of energy resources is completed. WDEQ/LQD reclamation standards for surface coal mines call for restoration of sagebrush on at least 20 percent of the reclaimed area. Those reclamation efforts can work in concert with USFS Standards and Guidelines toward mitigating impacts to wildlife species and habitats. New areas disturbed by mining in the South Porcupine tract's general analysis area would be reclaimed incrementally, but they may not be attractive to sage-grouse for many years due to slow establishment and growth rates of important sagebrush species. Information gleaned from the multi-year telemetry study at the North Antelope Rochelle Mine will be incorporated into reclamation efforts for the LBA tract to maximize successful reclamation of sage-grouse habitat. Estimates for the time it would take to restore shrubs, including sagebrush, to pre-mining density levels range from 20 to 100 years. Until sagebrush returns to its pre-mining density levels, a reduction in potential year-round sage-grouse habitat within the South Porcupine tract's general analysis area would persist. In the meantime, the presence of known and apparently suitable sage-grouse habitat elsewhere within the immediate area could provide alternate areas for dispersing grouse to use until reclaimed sagebrush stands have matured adequately to support a local population.

In keeping with the Direction Objectives for the Hilight Bill Geographic Area (USFS 2002, page 1-25), impacts to sage-grouse habitat in the North Antelope Rochelle Mine's permit area could be further mitigated off-site by efforts to preserve and enhance habitat on adjoining and nearby private lands, such as those currently under way through the Thunder Basin Grasslands Prairie Ecosystem Association. Management planning and processes that are developed through this combined effort among landowners and federal representatives will presumably provide suitable habitat for sage-grouse that disperse from the North Antelope Rochelle Mine area during the interim between habitat disturbance and completed reclamation. Should sage-grouse move onto new USFS lands proposed for mining in the future, agency Standards and Guidelines would offer appropriate protections for the species and its important habitats.

Despite the impacts to the Rochelle lek complex, the proposed leasing action would not contribute to significant reductions in the regional sage-grouse population overall, nor would it conflict with the current TBNG Plan or any future objectives to manage the area for this species.

<u>Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts</u>

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the

planning area. The sage-grouse is a common year-round resident throughout much of the PRB and TBNG, but has declined on and within 2 miles of the general analysis areas for the North, South, and West Hilight Field LBA Tracts over the last 30 years. Three decades of regular monitoring have documented that sage-grouse have not consistently inhabited the USFS lands analyzed for the North or South Hilight Field LBA Tracts, nor have they been confirmed as occupying USFS lands analyzed for the West Hilight Field LBA Tract since 1991. Currently, the nearest lek (Payne lek) with regular activity is more than 5.0 miles to the southeast of the USFS lands in the South and West Hilight Field LBA Tracts. Consequently, if the North, South and West Hilight Field LBA Tracts are leased, anticipated mining-related disturbances would not affect any identified and actively used seasonal sage-grouse habitats on or near USFS lands in the combined general analysis areas for these three tracts. Annual monitoring will continue for the life of the Black Thunder Mine, and would include new permit expansions and a one-mile perimeter. Should sage-grouse be observed on USFS lands in any of the three Hilight Field LBA Tracts' wildlife survey areas, appropriate monitoring and mitigation measures would be implemented to minimize impacts to birds, habitats, and populations.

Determination of Effect and Rationale – North Porcupine LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. More than 20 years of regular monitoring have documented that sage-grouse do inhabit USFS lands analyzed for the North Porcupine LBA Tract general analysis area. Currently, the Payne and Kort leks are the only sites with regular activity in recent years, with most birds seen at the Payne lek. Those leks have been used by an average peak count of 10.5 and 5.2 males per year, respectively, since they were discovered. Although impacts to the leks within the Rochelle complex will be detrimental to individual birds, that group represents only a small (4 to 17 percent) proportion of the sage-grouse population in the TBNG and Hilight Bill Geographic Area, respectively. Annual monitoring will continue for the life of the North Antelope Rochelle Mine, and will include new permit expansions and a 1-mile perimeter. Should additional sage-grouse leks or use areas be observed on USFS lands in the North Porcupine tract's wildlife survey area, appropriate monitoring and mitigation measures will be implemented to minimize impacts to birds, habitats, and populations.

Determination of Effect and Rationale – South Porcupine LBA Tract

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. More than 20 years of regular monitoring have documented that sage-grouse do not inhabit the grassland dominated South Porcupine LBA Tract general analysis area. Annual monitoring will continue for the life of the North Antelope Rochelle Mine, and will include new permit expansions and a one-mile perimeter. Should additional sage-grouse leks or use areas be observed on USFS lands in the South Porcupine tract's wildlife survey area,

appropriate monitoring and mitigation measures will be implemented to minimize impacts to birds, habitats, and populations.

H-3.2.27 Bald eagle (Haliaeetus leucocephalus)

Bald eagles occur throughout North America, from Alaska and Canada south to Florida, the Gulf Coast, and northern Mexico. The northwest coast of North America serves as the stronghold for this species, with approximately one-half of the population inhabiting Alaska.

The USFWS officially listed the bald eagle as an endangered species in 43 of the lower 48 states on July 4, 1976. The listing was due to a combination of several factors, including widespread habitat loss, negative effects of pesticide use on reproductive success, indiscriminant shooting, and others. The status of the bald eagle was downgraded to threatened throughout the lower 48 states in 1995. Bald eagle population trends began increasing throughout most of the species' range in the early 1990's, and it was proposed for de-listing in 1999.

On July 9, 2007, USFWS published a Federal Register notice (72 FR 37346) announcing that the bald eagle would be removed from the list of threatened and endangered species under the Endangered Species Act of 1973, as amended (16 U.S.C 1531 *et* seq.) on August 8, 2007. However, the protections provided to the bald eagle under the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668, and the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, will remain in place. The bald eagle is now recognized as a BLM and USFS Sensitive Species.

Bald eagles typically nest in large trees within a stand of mature, similarly sized trees either beside or in proximity (within 0.7 mile) to rivers, lakes, or reservoirs that harbor adequate fish populations. Those areas tend to be remote and experience little disturbance (Johnsgard 1990). Typically, the nest is placed in the crown of a large cottonwood or pine, but if the topography allows, eagles will nest on cliff edges or escarpments. Open-canopied trees and snags provide required perches in nesting and foraging areas.

All verified bald eagle nests in northeastern Wyoming (BLM Buffalo Field Office GIS database) are situated in significant, mature cottonwood stands along larger streams or rivers (i.e., Tongue River, Powder River, Clear Creek, and Little Thunder Creek). Nesting attempts are rare on the TBNG (Beske 1994). Fish and waterfowl are the primary source of food for nesting bald eagles. Where available, large to mid-size carrion and large rodents (e.g., prairie dogs) can also be an important dietary component.

Bald eagles nest and winter throughout Wyoming, though typically are not locally abundant in the northeastern portion of the state. The species regularly migrates through and winters in Campbell County (Cerovski et al. 2004), and has often been documented during winter and early spring at nearby coal mines (various coal mine annual reports are on file at the USFS Douglas

Ranger District Office in Douglas and/or with WDEQ/LQD in Cheyenne). Most eagles that migrate through or winter in Campbell County roost communally in stands of large ponderosa pine, along wooded cottonwood-riparian corridors, or in isolated stands of large trees. As water is scarce in that region, especially during winter, those birds likely forage widely for lagomorphs or carrion.

Existing Conditions – North, South and West Hilight Field LBA Tracts

The bald eagle is seasonally common and most frequently observed during the winter months. Bald eagles are relatively common winter residents and migrants in the PRB, but only rarely nest in that region. Potential bald eagle nesting and winter roosting habitat, being primarily scattered stands of mature cottonwood trees, are present on USFS and adjacent lands along Little Thunder Creek, which flows through the general analysis areas for the South and West Hilight Field LBA Tracts; no streams flow through the North Hilight Field tract's general analysis area.

In general, the combined wildlife survey areas for the three Hilight Field LBA Tracts do not contain unique or sizeable concentrated prey sources (e.g., fisheries, waterfowl wintering areas) that would be expected to attract bald eagles. As described in the North, South, and West Hilight Field LBA Tracts' black-tailed prairie dog analyses that are included within this appendix and in Section 3.10 of this EIS, two prairie dog colonies encompassing a total of approximately 89.2 acres were present on USFS lands within the three Hilight Field tracts' general analysis areas in 2007. A total of four prairie dog colonies encompassing approximately 112.1 acres were present in the three combined general analysis areas, and a total of 12 prairie dog colonies encompassing approximately 248.9 acres were present in the combined wildlife study areas for the three Hilight Field LBA Tracts in 2007 (Figures H-1, H-2 and H-3). Sheep and their lambs are present in this area in the spring, when bald eagles have typically left the region, and flocks are pastured there infrequently in the winter. The area does not support a large big game herd, though some groups do winter in the area.

Ground surveys for bald eagle winter roost sites were most recently conducted within the combined wildlife survey areas for the three Hilight Field tracts during baseline surveys beginning in 2006. Previous winter roost surveys also encompassed all or most potential habitat within that overall survey area. All winter roost surveys were conducted between ½ hour before and 1 hour after sunrise or between 1 hour before and ½ hour after sunset, per current BLM guidelines for survey timing and frequency. Biologists also watched for nesting bald eagles within the survey area while conducting surveys for other nesting raptors.

No bald eagle nests or winter roosts have been documented within 1 mile of USFS lands located within the North Hilight Field tract's general analysis area during any baseline or annual monitoring studies since they began in the late 1970s and early 1980s, respectively. Similarly, no bald eagle nests or winter

roosts have been documented within 1 mile of USFS lands located within the South Hilight Field tract's general analysis area during any baseline or annual monitoring studies since they began during those same timeframes.

The BLM and USFS wildlife databases indicate that the nearest potential bald eagle nest was identified in 2003 in T.43N., R.71W., NE¼NW¼ Section 29, which is in the southwestern corner of the West Hilight Field tract's general analysis area (Figure H-3). Although the nest has been labeled as a bald eagle site for that year, the circumstances of the sighting were less than definitive. The lone observation of the nest was made from approximately 1 mile away late in the nesting season, when young golden eagles are fully feathered except for their heads. It is possible that an inexperienced observer could have mistaken a young golden eagle for an adult bald eagle under those circumstances. Additionally, golden eagles were confirmed nesters at the same site location in both 2002 and 2004. Nevertheless, the site could be treated as a potential bald eagle nest for management purposes.

Existing Conditions – North and South Porcupine LBA Tracts

The bald eagle is seasonally common and most frequently observed during the winter months. Bald eagles are relatively common winter residents and migrants in the PRB, but only rarely nest in that region.

No bald eagle nests or winter roosts have been documented within 1 mile of USFS lands located within the general analysis areas for the North or South Porcupine LBA Tracts during any baseline or annual monitoring studies since they began in the late 1970s and early 1980s, respectively. Scattered stands of potential bald eagle nesting and winter roosting habitat (mature cottonwood corridors) are present on USFS and adjacent lands along Porcupine Creek as it flows through the general analysis area for the North Porcupine LBA Tract. No streams flow through the South Porcupine tract's general analysis area and few trees are present there.

In general, the combined wildlife survey areas for the two Porcupine LBA Tracts do not contain unique or sizeable, concentrated prey sources (e.g., fisheries, waterfowl wintering areas) that would be expected to attract bald eagles. As described in the North and South Porcupine LBA Tracts' black-tailed prairie dog analyses that are included within this appendix and in Section 3.10 of this EIS, no prairie dog colonies were present on USFS lands within either tract's general analysis area in 2007. Only one colony encompassing approximately 18.6 acres was present within the North Porcupine tract's general analysis area, and no colonies were present within the South Porcupine tract's general analysis area, in 2007. A total of 23 prairie dog colonies encompassing approximately 1,317 acres were present in the combined wildlife study areas for the two Porcupine LBA Tracts in 2007 (Figures H-4 and H-5). Sheep and their lambs are present in this area in the spring, when bald eagles have typically left the region, and flocks are pastured there infrequently in the

winter. The area does not support a large big game herd, though some groups do winter in the area.

Ground surveys for bald eagle winter roost sites were most recently conducted within the combined wildlife survey areas for the two Porcupine tracts during baseline surveys beginning in 2006. Previous winter roost surveys also encompassed all or most potential habitat within that overall survey area. All winter roost surveys were conducted between ½ hour before and 1 hour after sunrise or between 1 hour before and ½ hour after sunset, per current BLM guidelines for survey timing and frequency. Biologists also watched for nesting bald eagles within the survey area while conducting surveys for other nesting raptors.

Direct and Indirect Effects

As no winter roost sites or large groups of bald eagles have been documented in the general analysis area for any of the WAC LBA Tracts, potential impacts would be limited to occasional foraging individuals rather than a large segment of the population. The increased human presence and noise associated with construction activities, if conducted while eagles are wintering within the area, could harass or displace individual eagles during that period. Nesting eagles could also be distressed to the point of abandoning eggs or young, or their hunting efforts and success impacted. If necessary, the majority of direct effects could be mitigated by controlling the timing and location of disturbance activities, and/or through approved nest relocation efforts.

Indirect effects include additional disturbance and fragmentation of already limited foraging habitat within the geographic area. These impacts could result from a variety of large- and small-scale activities described previously for other species, including, but not limited to: topsoil stripping; overburden and coal removal; reclamation activities; and construction of roads, reservoirs, power lines (above ground and buried), fences, and pipelines. The locations of operations would shift throughout the expanded permit area as mining occurred, with habitats disturbed and reclaimed incrementally. Conversely, the addition of fences and raptor-safe power poles could possibly benefit foraging bald eagles by providing additional perch sites. Due to the limited presence of potential nesting or roosting sites, and lack of concentrated sources of prey, the direct and indirect effects of the Proposed Action and Alternative 2 for each LBA tract to bald eagles are expected to be minimal.

Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No bald eagle nests have been documented on or within 1 mile of the North or South Hilight Field LBA Tracts' general analysis areas, and only one dubious nesting event was recorded in the West Hilight Field LBA Tract's general analysis area over time. Bald eagle winter roost sites are absent from

all three Hilight Field LBA Tracts' wildlife survey areas, and little potential nesting or roosting habitat is present. Therefore, potential hazards for this species would be limited to foraging individuals during winter. Disturbance, fragmentation, and alteration of potential foraging habitat would occur. However, the Black Thunder Mine has avoided, where possible, and mitigated raptor impacts in the past through intensive raptor monitoring, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests.

Determination of Effect and Rationale – North and South Porcupine LBA Tracts
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. No bald eagle nests have been documented on or within 1 mile of the North or South Porcupine LBA Tract's general analysis area since annual monitoring began in the early 1980s. Potential bald eagle winter roost and nesting sites are limited in both LBA tract's wildlife survey area, and no reliable prey sources are present to support nesting or roosting bald eagles. Therefore, potential hazards for this species would be limited to foraging individuals during winter. Disturbance, fragmentation, and alteration of potential foraging habitat would occur. However, the North Antelope Rochelle Mine has avoided, where possible, and mitigated raptor impacts in the past through intensive raptor monitoring, implementation of USFWS approved mitigation measures, and adjusting operations to provide temporal and spatial buffers around raptor nests.

H-3.2.28 Mountain plover (*Charadrius montanus*)

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

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

Existing Conditions – North, South and West Hilight Field LBA Tracts

Mountain plovers are summer residents within portions of the TBNG. Most observations of mountain plovers in northeast Wyoming have been associated with prairie dog colonies. Approximately 86 percent of recently (since 1993) occupied mountain plover habitat in that region occurred within prairie dog colonies (Byer 2001). As described in the North, South, and West Hilight Field LBA Tracts' black-tailed prairie dog analyses that are included within this appendix and in Section 3.10 of this EIS, two prairie dog colonies encompassing a total of approximately 89.2 acres were present on USFS lands within the three Hilight Field tracts' general analysis areas in 2007. A total of four prairie dog colonies encompassing approximately 112.1 acres were present in the three combined general analysis areas, and a total of 12 prairie dog colonies encompassing approximately 248.9 acres were present in the combined wildlife study areas for the three Hilight Field LBA Tracts in 2007 (Figures H-1, H-2 and H-3).

As previously described for other short-grass species, the dominance of sagebrush in the North, South, and West Hilight Field LBA Tract's general analysis and wildlife survey areas provides only poor to marginal or unsuitable habitat for mountain plovers. The height and composition of vegetation on most USFS lands in the three Hilight Field tracts' general analysis areas is generally too tall and dense to provide suitable habitat for mountain plovers. The lack of occurrence of this species at the Black Thunder Mine and surrounding area, including all USFS lands in the analysis areas, is well documented. The nearest known population of nesting mountain plovers occurs at the Antelope Mine, approximately 9 miles south of the South Hilight Field tract's general analysis area, and even farther from the other two Hilight Field LBA Tracts.

Existing Conditions – North and South Porcupine LBA Tracts

Mountain plovers are summer residents within portions of the TBNG. Most observations of mountain plovers in northeast Wyoming have been associated with prairie dog colonies. Approximately 86 percent of recently (since 1993) occupied mountain plover habitat in that region occurred within prairie dog colonies (Byer 2001). Because of the similarity in habitat requirements between the mountain plover and McCown's longspur, similar existing conditions and impacts would apply for both species. The nearest known breeding population of mountain plovers occurs in a large prairie dog colony located at the Antelope Mine, approximately 4 miles southwest of the South Porcupine LBA Tract's general analysis area, and even farther from the North Porcupine LBA Tract.

As described above, sagebrush communities dominate the North Porcupine tract's general analysis area. Only one small (approximately 18.6 acres) prairie dog colony is present in that area, and it is located on non-federal lands. Generally, the vegetation in the North Porcupine tract's general analysis area and surrounding wildlife survey area is too tall and dense to attract mountain

plovers. The best potential habitat for this species occurs in a large (about 345.3 acres) occupied prairie dog colony immediately south of the North Porcupine tract's general analysis area (Figure H-4). Despite the presence of suitable habitat and the occurrence of annual monitoring in that area, mountain plovers have never been documented on USFS or adjacent lands within the North Porcupine tract's general analysis area.

Some portions of the grassland-dominated South Porcupine tract's general analysis area and surrounding area would be considered suitable mountain plover habitat, including both USFS and non-federal surface. The best potential habitat for this species occurs in the large (about 345.3 acres) occupied prairie dog colony that overlaps the wildlife monitoring area for both the North and South Porcupine LBA Tracts (Figures H-4 and H-5). Despite the presence of suitable habitat and the occurrence of annual monitoring in that area, mountain plovers have never been documented on USFS or adjacent lands within the South Porcupine tract's general analysis area.

Mountain plovers have been recorded in the combined North and South Porcupine tracts' wildlife survey areas only three times over the last 2 decades of annual monitoring. In mid-June 2004, single individuals were seen in short-grass areas on two separate days. One adult was observed on non-federal surface in the western portion of the South Porcupine tract's general analysis area. The second individual was recorded in the southwestern portion of the South Porcupine tract's wildlife survey area. Neither adult exhibited any defensive behavior, so both were presumed to be non-breeding birds. In early August 2005, a group of 15 to 20 mountain plovers was observed in the large (345.3 acres in size) prairie dog colony that overlaps both the North and South Porcupine tracts' wildlife survey areas. That group was presumed to be staging briefly during the fall migration. No other plover sightings have ever been recorded in that colony, despite survey efforts targeting that location.

Direct and Indirect Effects

Due to the similarit in their habitat associations, the direct and indirect effects to mountain plover in the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts would be the same as those described above for the McCown's longspur.

Determination of Effect and Rationale – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. USFS lands in the North, South, and West Hilight Field tracts' general analysis areas are dominated by sagebrush communities that are not attractive to short-grass species such as the mountain plover. No individuals of this species have been documented in any of the three Hilight Field tracts' general analysis areas, though limited potential habitat is present there. Documented alternative habitats for mountain plovers are present in portions

of the general area that are more appropriate for this species and are not currently scheduled for mining disturbance.

Determination of Effect and Rationale – North and South Porcupine LBA Tracts
Implementation of the Proposed Action or Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Suitable plover habitat on USFS lands is limited primarily to a large prairie dog colony that overlaps the wildlife survey areas for both the North and South Porcupine LBA Tracts; no prairie dog colonies are present on USFS lands in either tract's general analysis area. Only one mountain plover has been documented in the general analysis area for either Porcupine LBA tract in more than 20 years of annual monitoring. Documented alternative habitats for mountain plovers are present elsewhere in the region that is not currently scheduled for mining disturbance.

H-3.2.29 Loggerhead shrike (*Lanius ludovicianus*)

Loggerhead shrikes breed from Washington, northern Alberta, central Saskatchewan, and southern Manitoba, south to California and Florida, and east to southwestern Minnesota, southern Wisconsin, southern Michigan, and Maryland. This species is a common summer resident throughout Wyoming (Cerovski et al. 2004). Shrikes prefer relatively open, heterogeneous habitats characterized by grasses and forbs of low stature interspersed with bare ground and shrubs or low trees with perches for hunting. This species will use a wide variety of trees and shrubs, particularly thick or thorny species, as nesting substrates and hunting perches (Prescott and Bjorge 1999).

Although some shrike nests are used in subsequent years, fidelity to a nest site is limited. This species forages over relatively open habitats, feeding primarily upon arthropods, amphibians, small to medium-sized reptiles, small mammals, and birds (Yosef 1996). Shrikes may also feed upon road kill and carrion. This species is generally tolerant of human activity near a nest, although they will abandon if disturbed during egg-laying or early in incubation. The loggerhead shrike is declining in both number and overall range. Declines have been attributed to habitat loss and conversion, urbanization, pesticide contamination, and loss of insect prey as a result of pesticide use (Yosef 1996).

Existing Conditions – North, South and West Hilight Field LBA Tracts
Loggerhead shrikes are common summer residents within the TBNG, though they are not often observed on or adjacent to USFS lands within the North, South and West Hilight Field LBA Tracts. Shrikes have occasionally been seen in the 1-mile perimeter wildlife survey area for the adjacent Black Thunder Mine, which overlaps significant portions of USFS lands in the South Hilight Field tract's general analysis area. No actual shrike nests or recently fledged young have been documented on or near USFS lands in the general analysis areas for the North, South and West Hilight Field LBA Tracts, but this species could potentially nest in the general vicinity. Over time, most sightings have occurred in cottonwood-riparian corridors along primary streams in the general

Wright analysis area, or in taller greasewood stands. Neither habitat type is common in the general analysis areas for the North, South and West Hilight Field LBA Tracts. Shrikes have also been infrequently recorded perched on various fences or on overhead power lines at other nearby mines. Shrike foraging habitat is present throughout the North, South and West Hilight Field tracts' general analysis areas, including USFS lands. As indicated, existing utility and fence lines currently provide good quality hunting perches.

Existing Conditions – North and South Porcupine LBA Tracts

Loggerhead shrikes are common summer residents within the TBNG. This species has occasionally been observed in a small tree windbreak at an old homestead site located adjacent to the general analysis areas for the North and South Porcupine tracts on USFS lands in T.42N., R.71W., SW¼SE¼ Section 35 (Figures H-4 and H-5). The presence of young indicates that shrikes have nested in that windbreak at least once. Few other trees or other nesting habitats are present elsewhere in the North and South Porcupine tracts' wildlife survey areas, as described previously for the bald eagle. Shrikes have also been infrequently recorded perched on various fences or on overhead power lines elsewhere in the tracts' wildlife survey areas. Shrike foraging habitat is present throughout the North and South Porcupine LBA Tracts' general analysis areas, including USFS lands. As indicated, existing utility and fence lines currently provide good quality hunting perches.

Direct and Indirect Effects – North, South and West Hilight Field LBA Tracts

Implementation of the Proposed Action or Alternatives could result in direct and indirect impacts to loggerhead shrikes, though such impacts would likely be uncommon. No known nest sites have been documented on or adjacent to USFS lands in the North, South and West Hilight Field tracts' general analysis areas or elsewhere in the wildlife monitoring area for the adjacent Black Thunder Mine. The most probable direct impact would be the mortality of, or injury to, individuals foraging within or passing through the USFS lands due to collisions with future mine-related vehicles, or dispersal of foraging individuals due to active mining.

The relatively slow movement of mining equipment and the noise associated with the activity would decrease direct impacts associated with vehicle collisions. As loggerhead shrikes are not especially common in the North, South and West Hilight Field tracts' general analysis areas, indirect impacts would be limited despite the fragmentation, degradation, or loss of habitat in the short and mid-term. Any birds that would be displaced would be forced to travel to other locations with acceptable habitat. This could result in stress to individual birds, as well as potential decreased nesting effort and success. Prey numbers reduced by mining would be expected to rebound following reclamation due to generally high reproductive potential and prey tendencies to re-establish and adapt to disturbed and reclaimed areas. The locations of mine-related habitat disturbances and reclamation efforts would proceed incrementally throughout the expanded mining area as operations progressed.

Additionally, this mining activity would not conflict with the current TBNG Plan, or any future objectives to manage the TBNG for this species. USFS Standards and Guidelines would offer additional protections for any active nest sites that may be present in the area.

Direct and Indirect Effects – North and South Porcupine LBA Tracts

Implementation of the Proposed Action or Alternatives could result in direct and indirect impacts to loggerhead shrikes, though such impacts would likely be uncommon. Only one presumed nest site has been documented on or adjacent to USFS lands or elsewhere in the wildlife survey areas for the North and South Porcupine LBA Tracts; that site is just outside of the tracts' general analysis areas, but is within the existing mine permit area for the North Antelope Rochelle Mine. The most probable direct impact would be the mortality of, or injury to, individuals foraging within or passing through the USFS lands due to collisions with future mine-related vehicles, or dispersal of foraging individuals due to active mining.

The relatively slow movement of mining equipment and the noise associated with the activity would decrease direct impacts associated with vehicle collisions. As loggerhead shrikes are not especially common in the North and South Porcupine tracts' general analysis areas, indirect impacts would be limited despite the fragmentation, degradation, or loss of habitat in the short and mid-term. Any birds that would be displaced would be forced to travel to other locations with acceptable habitat. This could result in stress to individual birds, as well as potential decreased nesting effort and success. Prey numbers reduced by mining would be expected to rebound following reclamation due to generally high reproductive potential and prey tendencies to re-establish and adapt to disturbed and reclaimed areas. The locations of mine-related habitat disturbances and reclamation efforts would proceed incrementally throughout the expanded mining area as operations progressed. Additionally, this mining activity would not conflict with the current TBNG Plan, or any future objectives to manage the TBNG for this species. USFS Standards and Guidelines would offer additional protections for any active nest sites that may be present in the area.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Such impacts would be minimized by the lack of regular sightings and known nesting attempts, as well as the relative paucity of suitable nesting habitat on or adjacent to the USFS lands analyzed in this EIS and their surrounding region. Degradation, fragmentation, or loss of potential foraging habitat, reduction in prey populations, and potential collisions with vehicles may occur. Given the lack of birds recorded in the area, and the composition of the shrike's prey base (insects, small mammals, etc.), impacts to shrikes would be minimal. USFS Standards and Guidelines would apply for active nests during the breeding season. Additionally, mining

the USFS lands would not conflict with the current TBNG Plan, or any future objectives to manage the TBNG for loggerhead shrikes.

H-3.2.30 Brewer's sparrow (*Spizella breweri*)

The breeding range of the Brewer's sparrow extends from southwestern Yukon, southern Alberta, and southwestern Saskatchewan, south (east of the Cascades and Sierras) to southern California, central Arizona, and northern New Mexico (Rotenberry et al. 1999). The Brewer's sparrow is a common summer resident of the basin-prairie and mountain-foothills throughout Wyoming (Cerovski et al. 2004). Brewer's sparrow is a sagebrush obligate species (Rotenberry et al. 1999).

This species is an uncommon cowbird (*Molothrus ater*) host and typically builds a small cup nest low in sagebrush shrubs. Brewer's sparrows prefer to nest in medium-sized (48-90 centimeters, or 19-35 inches) live sagebrush within relatively dense (26-42 percent canopy cover) stands (Walker 2004). Grass height and density are important factors for nest concealment. Although tolerant of human visitation, this species may abandon a nest if disturbed during the construction process.

Brewer's sparrows feed primarily on small insects and, to a lesser extent, seeds from grasses and forbs. Throughout areas where they have been surveyed, the species appears to have undergone and continues to undergo statistically significant declines (Rotenberry et al. 1999). Major threats to Brewer's sparrow populations are similar to those faced by other declining sagebrush-obligate species and include habitat conversion and fragmentation, invasion by non-native plants, altered fire regimes, livestock overgrazing, conifer encroachment, energy development, and conversion to urban or residential housing (Walker 2004).

Existing Conditions – North, South and West Hilight Field LBA Tracts

Brewer's sparrows are common summer residents within the TBNG and southern Campbell County (Cerovski et al. 2004). Breeding bird survey data from annual monitoring and baseline studies conducted for the Black Thunder Mine, as well as incidental observations over time, have shown that the Brewer's sparrow is a common but limited breeder in the area. This species is commonly observed and has been recorded in sagebrush habitats in the general Wright analysis area during many years of surveys. Although no nests have been encountered in the general analysis areas for the North, South and West Hilight Field LBA Tracts, the presence and behavior (singing) of birds throughout spring and summer suggest that Brewer's sparrows nest in the sagebrush stands common to those areas.

Existing Conditions – North and South Porcupine LBA Tracts

Brewer's sparrows are common summer residents within the TBNG and southern Campbell County (Cerovski et al. 2004). Breeding bird survey data from annual monitoring and baseline studies conducted for the North Antelope

Rochelle Mine, and incidental observations over time, have shown that the Brewer's sparrow is a common but limited breeder in the area. This species has been recorded during many years of surveys in sagebrush habitats within and near the North Porcupine LBA Tract, but no Brewer's sparrows have been recorded in the grassland-dominated general analysis area for the South Porcupine LBA Tract. Although no nests have been encountered, the presence and behavior (singing) of birds throughout spring and summer suggest that Brewer's sparrows nest in the sagebrush stands common to the tract's general analysis area.

Direct and Indirect Effects

Habitat loss, degradation, and fragmentation of sagebrush communities in the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field and North Porcupine LBA Tracts would result from a variety of mining operations such as topsoil stripping, drilling, and reservoir construction, among others. Potential nesting and foraging habitat would also be fragmented by linear disturbances such as the construction, maintenance, and removal of roads, fences, power lines, and pipelines. Those disturbances could also create new travel corridors for mammalian predators that reside in or pass through the area. However, many such 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. All habitat disturbances and reclamation efforts would shift throughout the expanded area of mining operations.

The use of existing roads, when possible, could minimize impacts related to traffic hazards and predator travel corridors. Increased activity and noise, especially during the nest initiation period, could inhibit nesting proximate to mining activities. Foraging could also be hindered within these areas, especially where active mining occurs. Additional infrastructure and activity associated with the expansion of the mine, in combination with other ongoing disturbances (e.g., CBNG operations), could displace Brewer's sparrows from any historical use areas that might occur in the area. Those birds could potentially move into other sagebrush stands in the general vicinity, assuming they are not already occupied.

Reclamation of disturbed areas will occur incrementally as mining is completed in a given portion of the mine and will eventually mitigate impacts to sagebrush habitats to some degree, though such efforts could take decades to benefit sagebrush obligates such as the Brewer's sparrow. Impacts to sagebrush habitat on USFS lands could be further mitigated off-site by efforts to preserve and enhance such habitat on adjacent and nearby private lands, as described above. Standards and Guidelines for sagebrush habitats outlined in the TBNG Plan (USFS 2002, pages 1-18; Appendix D) would be implemented as necessary, and could serve to sustain regional populations of this sparrow. Those management guidelines would apply only to activities beyond the North

Hilight Field, South Hilight Field, West Hilight Field, and North Porcupine LBA Tracts.

No impacts to Brewer's sparrows are expected in the genral analysis area for the South Porcupine tract due to the documented lack of sparrows and suitable sparrow habitat in that area.

Determination of Effect and Rationale

Implementation of the Proposed Action or Alternative 2 for each LBA tract *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* within the planning area. Some habitat loss, degradation, and fragmentation would occur on and near USFS lands in the general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine and South Porcupine LBA Tracts, along with potential impacts to individuals. However, the presence of large stands of sagebrush elsewhere in the general vicinity suggests that Brewer's sparrows would remain viable within the TBNG for at least the short-term. Additionally, the Proposed Action or Alternative 2 for each LBA tract would not conflict with the current TBNG Plan (USFS 2002) or future objectives to manage the area for this species. Application of appropriate USFS Standards and Guidelines, successful reclamation efforts, and proper land management on adjoining lands could mitigate potential impacts, to some degree.

H-4.0 CUMULATIVE EFFECTS REGARDING SENSITIVE SPECIES

Cumulative effects are defined under the National Environmental Policy Act of 1969 (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 that occur on federal and non-federal lands within the general Wright analysis area, including USFS lands within that area and neighboring lands. Those sources include direct and indirect impacts of mining (with an anticipated life of at least 20 more years), extraction of conventional oil and gas and CBNG reserves, road development and relocation, construction and removal of power lines and pipelines, grazing (livestock and wildlife), drought, occupied residences, and hunting and trapping. Those activities have occurred in the vicinity of the general Wright analysis area in the past and most are expected to continue at similar levels, at least for the near future.

Coal mining and CBNG development are expected to occur at an increased rate in the future. Other reasonable and foreseeable developments within the area could potentially 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. However, those standards are dramatically different in both

implementation and monitoring. As new areas of disturbance related to energy extraction activities are added, areas that have been mined out will be restored and reclaimed. Similarly, oil and gas well sites will be reclaimed once they are depleted and abandoned.

No critical habitat for any USFS Sensitive Species has been delineated in the general Wright analysis area (including the USFS lands). Any habitat losses that do occur will eventually be mitigated for most species by reclamation with native seed mixes, which may improve habitat quality by reducing the presence of non-native plants (e.g., crested wheatgrass) within the area. Leasing lands within the general Wright analysis area will not conflict with the current TBNG Plan, or any future objectives to manage USFS lands and provide habitat for sensitive species. Because effects of disturbance on sensitive species inhabiting the same habitat types would be the same, cumulative impacts are analyzed according to species' main habitat associations.

H-4.1 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, chestnut-collared longspur, and McCown's longspur. Cumulative impacts to these habitats and associated species will largely result from activities that would decrease occupied black-tailed prairie dog colonies within the area. As the prairie dog is the most common sensitive species in the area, it has the most potential to be affected by cumulative impacts from the Proposed Actions and Alternatives. Specifically, individuals could be killed or injured by activities in or near prairie dog colonies, and habitat would be lost until reclamation takes place. Incremental habitat disturbance and freshly turned soil in stripped and reclaimed areas would allow escaping or dispersing animals to create new burrows, and thus maintain a presence in the area.

Burrowing owls and mountain plovers rely heavily on prairie dogs to provide and maintain suitable nesting habitat. Longspurs are also often found in prairie dog colonies in the overall general Wright analysis area. Therefore, any activities that jeopardize prairie dogs will also affect those species to some degree. Although impacts would occur on approximately 148.6 acres of prairie dog colonies that are currently located within the combined general analysis areas for the North Hilight Field, South Hilight Field, West Hilight Field, West Jacobs Ranch, North Porcupine, and South Porcupine LBA Tracts (108.1 acres of which occur on or within one-quarter-mile of USFS lands), the presence of approximately 1,490.6 total acres of colonies that currently exist on and within 2 miles of the six combined general analysis areas would minimize negative impacts to those three species. Despite their strong association with prairie dogs, species such as burrowing owls, mountain plovers, and longspurs can all utilize short-grass habitats other than prairie dog colonies. However, all of those avian species would benefit from the presence of undisturbed prairie dog

colonies surrounding the six combined general analysis areas, including USFS lands, as well as other short-form vegetative communities.

Despite the presence of additional habitat outside the six combined general analysis areas, cumulative effects expected for these five species would include habitat destruction, alteration, and fragmentation. As indicated, some individuals may be killed or injured by vehicles or equipment, collisions with fences, and poisoning or shooting. Predation rates on some species may increase due to the creation of favorable habitats, perches, 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 be displaced from existing territories. Such occurrences would increase competition for available adjacent territories. If those areas have already reached carrying capacity, the result would be intra-specific competition followed by nutritional stress, decreased fecundity, and/or mortality.

H-4.2 Mixed Sagebrush and/or Mid-grass Species

Mid-grass parcels interspersed with sagebrush commonly occur in the general Wright analysis area, including USFS lands. Mining in the area would impact the sagebrush shrubland/mixed prairie grassland habitats that are present. Evaluated species for mixed grassland habitats included the swift fox, long-billed curlew, and ferruginous hawk. Cumulative impacts to those species would be the similar to those described above. However, as all of these species have the capacity of utilizing a variety of habitats, including prairie dog colonies and short-grass areas, beyond the overall general Wright analysis area, the cumulative effects would be somewhat lessened.

Regarding the swift fox and ferruginous hawk, the fragmentation, alteration, or destruction of suitable habitats would also destroy denning and shelter sites or nest sites, respectively, and would potentially facilitate inter-specific competition for available prey bases. Both the swift fox and hawks using these habitats would also be negatively affected by activities that reduce prey availability. The impacts would be partially mitigated by the existing presence of alternate denning and nesting sites in the area that would not be disturbed by the Proposed Actions or Alternatives. The greatest threat to mixed sagebrush and/or mid-grass species would arise from the creation of habitat patches that are too small to attract individuals or sustain viable breeding pairs or populations.

H-4.3 Sagebrush Obligates

Species associated with sagebrush habitats that could occur in or near the general Wright analysis area and associated USFS lands include the Greater sage-grouse and Brewer's sparrow. However, more than 25 consecutive years of monitoring have demonstrated that the sagebrush stands within most of this area are insufficient in size and structure to provide optimum sage-grouse

habitat. However, due to the total combined acreage of big sagebrush shrubland that would be disturbed by mining the six combined general analysis areas (approximately 18,330 total acres), sage-grouse would likely experience cumulative impacts by the Proposed Actions or Alternatives. Similarly, the relatively small and somewhat sparse shrub stands within the general analysis areas for these six LBA tracts provide limited, marginal nesting habitat for Brewer's sparrows.

Given the widespread occurrence of sagebrush habitat within the overall general Wright analysis area (including USFS lands), cumulative impacts to sagebrush habitats and their associated species would occur as a result of leasing and mining these six LBA tracts under the Proposed Actions or Alternatives. Direct impacts would likely be limited to the injury or mortality of individual sage-grouse and Brewer's sparrows, or their nests or young. Indirect impacts to the sagebrush-dependant species could entail changes in their presence or distribution as the quantity and quality of existing sagebrush stands in the area are diminished due to habitat fragmentation, alteration, degradation, and conversion of shrubland communities during ongoing and new mining operations.

Any displaced individuals would have to compete for the limited availability of adjacent territories, and if those areas have reached carrying capacity, intra-specific competition may result in nutritional stress, decrease in fecundity, or mortality to affected individuals. Sagebrush habitats lost to mining would be mitigated, as required. However, those efforts would not likely be able to keep pace with, or compensate for, the on-going loss or alteration of sagebrush habitat within the area, as sagebrush stands can take two or three decades to re-establish.

H-4.4 Tree or Wetland/Aquatic Species

Within the general Wright analysis area, trees are found primarily in a few shelterbelts/windbreaks planted adjacent to widely scattered ranching facilities. Very few other trees are present due to the lack of water and suitable habitats. Approximately 602 acres of wetlands and other waters of the U.S. have been identified within the combined general analysis areas for these six LBA tracts, which provide wetland/aquatic habitats on and near USFS lands. Species associated with treed or aquatic habitats that could occur in or near those areas include the loggerhead shrike and northern leopard frog, though the latter is less likely to be present. Cumulative effects to shrikes would be similar, but slightly greater than, those for non-raptor avian species within mixed mid-grass and shrub habitats. The increased intensity of effects would be due to the overall lack of trees (potential nest sites), and thus the limited alternate habitats as trees are lost to mining. Mitigating that impact is the fact that detailed tree inventories would be conducted prior to all mining disturbances, as required by state and federal agencies, so that every tree that is lost to mining would be replaced during final reclamation. High intensity activity and noise when mining is most proximate along stream corridors where

native trees occur could deter shrikes from nesting in the area, at least until they acclimated to the disturbance. All trees destroyed by mining will be replaced during reclamation, but it will take decades for them to mature to their current stature.

Northern leopard frogs are not prevalent within either the general Wright analysis area or associated USFS lands, and therefore have little potential to be affected by cumulative impacts from the Proposed Actions and Alternatives. Wetland and aquatic habitats for northern leopard frogs are considered very poor to unsuitable on USFS lands within the combined general analysis areas for these six LBA tracts, and no frog sightings have been recorded on USFS lands within these areas. If this species is present in the future, individuals could be killed or injured by activities in proximity to aquatic habitats. Dewatering or degradation of breeding habitats could kill eggs, tadpoles, or over-wintering adults, as well as increase predation rates on adults and eggs. Conversely, the creation and augmentation of aquatic habitats for sedimentation ponds and other purposes could maintain and possibly increase local northern leopard frog populations. There would be no net loss of jurisdictional wetlands, as they would be restored under the jurisdiction of the U.S. Corps of Engineers (refer to Section 3.7 of this EIS). Non-jurisdictional and functional wetlands would be restored in accordance with the requirements of the surface landowner or as required by WDEQ/LQD.

Overall, despite the death, injury, and displacement of some animals, the cumulative impacts associated with the Proposed Actions or Alternatives 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 not been documented within the general Wright analysis area or associated USFS lands over the last 25 years, have already been displaced from those areas, or have remained present despite the ongoing mine and non-mine activities in and near those areas.

H-5.0 TBNG PLAN COMPLIANCE

The Proposed Actions and Alternatives are considered to be in compliance with Grassland-wide, Geographic Area, and Management Area Standards and Guidelines for wildlife (including regionally sensitive species, and Management Indicator Species) detailed in the Grassland Plan (USFS 2002).

H-6.0 REQUIRED MITIGATION AND RECOMMENDED MONITORING

To help protect USFS Region 2 Sensitive Species, the mine operator will notify the USFS District Ranger, Douglas, Wyoming, if sensitive species nests or dens, in addition to those identified in the Biological Assessment (Appendix G of this EIS), are located during mining. Future surveys for any USFS Region 2 Sensitive Species could be conducted in response to requests from the USFS Douglas District Ranger. This would allow assessments of how, and if, implementation of the TBNG Plan is benefiting these species.

Mitigation measures designed to reduce impacts to wildlife that are required by the Surface Mining Control and Reclamation Act (SMCRA) and state law include:

- Using raptor-safe power lines;
- Designing fences to permit wildlife passage;
- Creating artificial raptor nest sites;
- Relocating raptor nests and taking other action to maintain active nesting pairs;
- Restoring pre-mining topography to the maximum extent possible;
- Planting a diverse mixture of grasses, forbs, and shrubs in configurations beneficial to wildlife; and
- Building and maintaining sediment control ponds or other sediment control devices during mining.

To further minimize negative impacts to faunal species of concern, the USFWS requires additional species-specific protective measures, as well as targeted monitoring and mitigation plans for certain Region 2 Sensitive Species.

H-7.0 USFS MANAGEMENT INDICATOR SPECIES EVALUATION

H-7.1 Introduction

Species that have been identified by the Regional Forester as Management Indicator Species (MIS) must be considered for the Wright Area Coal Lease Applications because the general analysis areas for North Hilight Field, South Hilight Field, West Hilight Field, North Porcupine, and South Porcupine LBA Tracts include federal lands administered by the USFS. There is no USFS administered surface within the general analysis area for the West Jacobs Ranch LBA Tract. The purpose of this section of this Appendix is to provide information about the potential environmental effects that leasing the USFS administered lands would have on USFS TBNG Forest Plan MIS.

H-7.2 Species Evaluated and Rationale

A Management Indicator Species 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 socially or economically important" (USFS 2002). MIS are selected to serve as barometers for species diversity and viability. These 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 the TBNG are identified by Geographic Area. In accordance with the TBNG Plan (USFS 2002), the greater sage-grouse was selected as the MIS to be evaluated for this project (as defined for the Hilight Bill Geographic Area).

For detailed sage-grouse habitat and population information, please see Section 3.10.5 in this EIS. This MIS evaluation and the Biological Assessment (Appendix G) of this EIS analyzes and discloses potential effects to wildlife if lands within the general Wright analysis area are leased and mined. The USFS Douglas Ranger District biologists have reviewed Section 3.10 and the BA in this EIS.

In addition to the information provided in this analysis, a full Biological Assessment and Biological Evaluation (BABE) document is being prepared for review by USFS Douglas Ranger District biologists as part of future permitting actions. Among other things, that document will provide supplemental information regarding local and regional population trends for the MIS (greater sage-grouse). The approved BABE will be available for public view at the Douglas Ranger District office.

H-8.0 REFERENCES AND LITERATURE CITED

Baxter, G.T. and M.D. Stone, 1980, Amphibians and reptiles of Wyoming. Wyoming Game and Fish Department, Lander, Wyoming.

Bechard, M.J. and J.K. Schmutz, 1995, Ferruginous hawk (*Buteo regalis*). *In* The Birds of North America, No. 172 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Beske, A.E., 1994, 1994 raptor nest survey on the Thunder Basin National Grassland. USFS, Douglas Ranger District, Medicine Bow National Forest. Unpublished report.

Brown, K.G. and K.M. Clayton, 2004, Ecology of the Greater sage-grouse (*Centrocercus urophasianus*) in the coal mining landscape of Wyoming's Powder River Basin. Final Technical Report prepared by Thunderbird Wildlife Consulting, Gillette, Wyoming.

Bureau of Land Management (BLM), 2002, BLM Wyoming Sensitive Species Policy and List September 20, 2002, available on the Internet as of July 2008: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/wildlife.Par.9226.File.dat/02species.pdf>.

_____, 2008, West Antelope II Coal Lease Application Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management, Casper Field Office, Casper, Wyoming, December 2008.

Byer, T., 2001, Biological assessment and biological evaluation report for Devon Energy Production Company. USFS, Douglas Ranger District.

Cerovski, A.O., M. Grenier, B. Oakleaf, L. Van Fleet, and S. Patla, 2004, Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming. Wyoming Game and Fish Department Nongame Program, Lander.

Connelly, J.W., W.L. Wakkinen, A.D. Apa, and K.P. Reese, 1991, Sage grouse use of nest sites in southeastern Idaho. J. Wildl. Manage. 55:521-524.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver, 2004, Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report, Cheyenne, Wyoming.

Cotterill, S.E., 1997, Status of the swift fox (*Vulpes velox*) in Alberta. Alberta Environmental Protection, Wildlife Status Report No. 7, Edmonton, AB., Canada.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, P.A. Rabie, and B.R. Euliss, 2003a, Effects of management practices on grassland birds: Long-billed Curlew (Version 12 Dec 2003). Northern Prairie Wildlife Research Center, Jamestown, ND. Available from website on the Internet: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/lbcu/lbcu.htm>.

_____, 2003b, Effects of management practices on grassland birds: Chestnut-collared Longspur (Version 28 May 2004). Northern Prairie Wildlife Research Center, Jamestown, ND. Available from website on the Internet: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/cclo/cclo.htm>.

_____, 2003c, Effects of management practices on grassland birds: McCown's Longspur (Version 12 Aug 2004). Northern Prairie Wildlife Research Center, Jamestown, ND. Available from website on the Internet: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/mclo/mclo.htm>.

_____, 2003d, Effects of management practices on grassland birds: Mountain Plover (Version 12 Dec 2003). Northern Prairie Wildlife Research Center, Jamestown, ND. Available from website on the Internet: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/mopl/mopl.htm>.

Drut, M.S., J.A. Crawford, and M.A. Gregg, 1994, Brood habitat use by sage grouse in Oregon. Great Basin Naturalist 54:170-176.

Gregg, M.A., J.A. Crawford, M.S. Drut, and A.K. DeLong, 1994, Vegetational cover and predation of sage grouse nests in Oregon. J. Wildl. Manage. 58:162-166.

Grenier, Martin, 2003, An Evaluation of Black-footed Ferret Block Clearances in Wyoming: Completion Report. Wyoming Game and Fish Department. Lander, Wyoming. 16pp.

Hill, D.P., 1998, Status of the long-billed curlew (*Numenius americanus*) in Alberta. Alberta Environmental Protection, Wildlife Status Report No. 16, Edmonton, AB.

Hill, D.P. and L.K. Gould, 1997, Chestnut-collared longspur (*Calcarius ornatus*). *In* The Birds of North America, No. 288 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Johnsgard, P.A., 1990, Hawks, eagles, and falcons of North America. Smithsonian Institution Press, Washington, D.C.

Klute, D.S., L.W. Ayers, M.T. Green, W.H. Howe, S.L. Jones, J.A. Schaffer, S.R. Sheffield, and T.S. Zimmerman, 2003, Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Knopf, F.L., 1996, Mountain plover (*Charadrius montanus*). *In* The Birds of North America, No. 211 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

McKee, Gwyn, 2006, Nest Success and Survival of the Greater Sage-grouse (*Centrocercus urophasianus*) at the North Antelope Rochelle Surface Coal Mine in 2006. 2006 Summary Report.

_____, 2007, Personal communication with Gwyn McKee, wildlife biologist with Thunderbird-Jones & Stokes.

NatureServe, 2007, NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.0. NatureServe, Arlington, Virginia. Available from website on the Internet as of January 2007: <http://www.natureserve.org/explorer>.

Naugle, D.E., K.E. Doherty, and B.L. Walker, 2006, Sage-grouse winter habitat selection and energy development in the Powder River Basin: Completion Report. Available from website on the Internet as of March 2009: <http://www.voiceforthewild.org/SageGrouseStudies/Winter_habitat_report.pdf>.

North Antelope Rochelle Mine, 2007, 2006 Annual Wildlife Monitoring Report, submitted to WDEQ/LQD. Prepared by Thunderbird-Jones & Stokes. On file with WDEQ/LQD in Cheyenne, Wyoming.

Northeast Wyoming Sage-grouse Working Group (NWSGWC), 2006, Northeast Wyoming Sage-grouse Conservation Plan. August 15. Available from website on the Internet as of December 2007: <http://gf.state.wy.us/wildlife/wildlife_management/sagegrouse/Northeast/NEConsvPlan.pdf>.

Orpet, J., 2007, Personal communication with Jim Orpet, wildlife biologist with Intermountain Resources.

Powder River Coal, LLC (PRC), 2009, North Antelope Rochelle Mine Permit Application, WDEQ/LQD Surface Mine Permit 569-T7, approved July 28, 2009. On file at WDEQ/LQD office in Cheyenne, Wyoming.

Prescott, D.R.C, and R.R. Bjorge, 1999, Status of the loggerhead shrike (*Lanius ludovicianus*) in Alberta. Alberta Environment, Wildlife Status Report No. 24, Edmonton, AB, Canada.

Roche, Kathy, 2009, Personal communication between K. Roche, Forest Ecologist and North Zone Botanist, Medicine Bow Routt National Forest and Thunder Basin National Grassland, Laramie Ranger District, Laramie, Wyoming, and S. Bucklin, BLM Environmental Specialist, BLM High Plains District Office, Casper, Wyoming, January 28.

Rotenberry, J.T., M.A. Patten, and K.L. Preston, 1999, Brewer's sparrow (*Spizella breweri*). *In* The Birds of North America, No. 390 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Schmutz, J.K., 1989, Hawk occupancy of disturbed grasslands in relation to models of habitat selection. Condor 91:362-371.

Schroeder, M.A, J.R. Young, and C.E. Braun, 1999, Sage grouse (*Centrocercus urophasianus*). *In* The Birds of North America, No. 425 (A. Poole and F. Gill, Eds.) The Birds of North America, Inc., Philadelphia, PA.

Thunder Basin Coal Company (TBCC), 2005, Black Thunder Mine Permit Application, WDEQ/LQD Surface Mine Permit 233-T7, approved November 1, 2005. On file at WDEQ/LQD offices in Cheyenne and Sheridan, Wyoming.

U.S. Department of Agriculture-Forest Service (USFS), 2002, Updated Land and Resource Management Plan for the Thunder Basin National Grassland, Medicine Bow-Routt National Forest, Rocky Mountain Region. USDA Forest Service, Medicine Bow-Routt National Forest, Rocky Mountain Regional Office, Denver, Colorado.

_____, 2003, Thunder Basin National Grassland Wildlife GIS Data and Map. Unpubl.

_____, 2007, Species Conservation Project: Region 2 Regional Forester's Sensitive Species – Rocky Mountain Region. Available from website on the Internet as of January 2009: <http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml>.

U.S. Department of Interior-Fish and Wildlife Service (USFWS), 1989, Black-footed ferret survey guidelines for compliance with the endangered species act. USFWS, Denver, Colorado, and Albuquerque, New Mexico. April 1989.

Wagner, G., 1997, Status of the northern leopard frog (*Rana pipiens*) in Alberta. Alberta Environmental Protection, Wildlife Status Report No. 9, Edmonton, AB, Canada.

Walker, B., 2004, Effects of management practices on grassland birds: Brewer's Sparrow. Northern Prairie Wildlife Research Center, Jamestown, ND. Jamestown, ND: Northern Prairie Wildlife Research Center Online. Available from website on the Internet: <http://www.npwrc.usgs.gov/resource/literatr/grasbird/brsp/brsp.htm (Version 12 Aug 2004)>.

White, C.M. and T.L. Thurow, 1985, Reproduction of ferruginous hawks exposed to controlled disturbance. The Condor 87:14-22.

With, K.A., 1994, McCown's longspur (*Calcarius mccownii*). *In* The Birds of North America, No. 96 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Yosef, R., 1996, Loggerhead shrike (*Lanius ludovicianus*). *In* The Birds of North America, No. 231 (A. Poole and F. Gill, Eds.), The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.