1999-2000 WILDLIFE STUDIES
JONAH FIELD II
NATURAL GAS DEVELOPMENT PROJECT

Prepared for

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and

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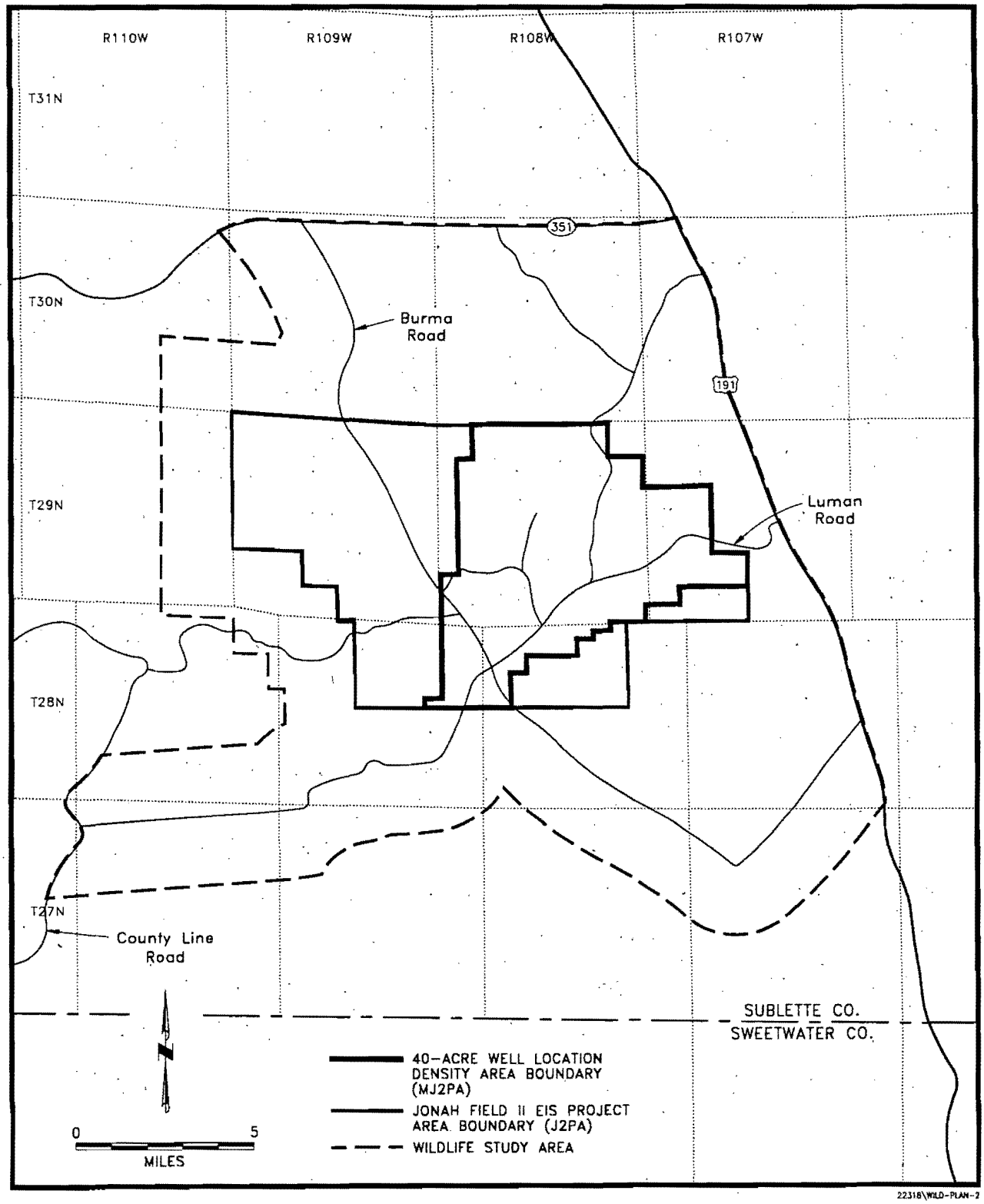
1.0 INTRODUCTION

This report was prepared by TRC Mariah Associates Inc. (TRC Mariah) for McMurry Oil Company (McMurry), BP Amoco Production Company, and other operators (collectively referred to herein as the Operators), in compliance with the U.S. Bureau of Land Management (BLM) Record of Decision (ROD) for the Jonah Field II natural gas project (BLM 1998a, Appendix D) and the Decision Record (DR) for the Modified Jonah Field II project (BLM 2000a). The goals of the ROD Wildlife Monitoring/Protection Plan (WMPP) and subsequent modifications made in the DR are to monitor wildlife population trends on and adjacent to the Jonah Field II project area (J2PA) and Modified Jonah Field II project area (MJ2PA) during the course of project development and operations and to avoid and/or minimize adverse impacts to wildlife present on project-affected areas. Implementation of the plan, as presented in this report, provides land managers and project personnel opportunities to achieve and maintain wildlife productivity and populations on the project area by minimizing and/or avoiding potential adverse impacts to wildlife associated with project development. Wildlife monitoring was initiated in 1997 and continued through 2000.

This report presents the methods and results of 1999 and 2000 wildlife studies on the wildlife study area (WSA), which includes the MJ2PA, J2PA, and adjacent areas (Map 1.1 and Appendix A); wildlife data collected in 1997 and 1998 are presented in BLM (1999). Observational data were collected by BLM, TRC Mariah, Wyoming Game and Fish Department (WGFD) and U.S. Fish and Wildlife Service (USFWS) personnel, and trends across years are noted, where possible. Additionally, potential wildlife disturbance sources are identified and monitoring and protection measures proposed for 2001 are presented. Monitoring and protection measures are consistent with those identified in the original ROD (BLM 1998a), the environmental assessment (EA) for the Modified Jonah Field II project (BLM 2000b), and include additional BLM- and/or Operator-requested measures.



Map 1.1 Wildlife Study Area, Jonah II Project, 2000.

2.0 METHODS

Inventory and monitoring protocols are identified below for each wildlife species/category. The wildlife species/categories for which specific inventory and monitoring procedures were applied were developed based on management agency (i.e., BLM, USFWS, WGFD) and individual concerns identified during the preparation of the Environmental Impact Statement for the Jonah II project (BLM 1997, 1998b) and the EA for Modified Jonah Field II Project (BLM 2000b). Specific inventory and monitoring techniques generally follow the methods presented in the WMPP for this project (BLM 1998a, Appendix D), and additional methods identified in BLM (2000b).

2.1 RAPTORS

Aerial (helicopter) raptor nest surveys of the WSA were conducted in 1997 and 1998 to determine the location and activity status of raptor nests in the area (BLM 1999). In 1999 and 2000, raptor nest activity status surveys were conducted by TRC Mariah personnel on the ground using four-wheel drive vehicles and pedestrian reconnaissance. Activity status surveys were conducted on May 30 and 31, and June 1, 1999, and May 2, 24, 25, 28, and 29, 2000.

In 1999 and 2000, raptor nest productivity surveys were conducted by TRC Mariah at all active nest locations within 1.0 mi of existing or proposed development areas (see Appendix A, Wildlife Map). Productivity surveys were conducted on July 12 and August 8, 1999, and June 12 and 13, and July 10 and 14, 2000 using four-wheel drive vehicles and pedestrian reconnaissance. In the case of nest failure or abandonment, attempts were made to identify causative factors. All data collected during raptor activity and productivity surveys were recorded on maps, Raptor Nesting Records, and Raptor Observation Data Sheets (see Appendix A [Wildlife Map], Appendix B [Raptor Observation Data Sheets], and Appendix C [Raptor Nesting Records]).

The boundary of each ferruginous hawk nesting territory was approximated based on the location of known nests in the area. No attempts were made to determine the general foraging territories for nesting pairs.

All raptor nest/productivity surveys were conducted using procedures that minimize potential adverse effects to nesting raptors as identified in the ROD (BLM 1998a, Appendix D).

No artificial nest structures (ANSs) were erected in 1999 or 2000.

2.2 SAGE GROUSE

Sage grouse lek surveys were conducted in 1999 and 2000 to determine the location and extent of sage grouse breeding activities in the WSA (see Map 1.1 and Appendix A). No investigations were conducted at sage grouse lek 16. Surveys were conducted primarily by WGFD and BLM personnel, and included aerial flights of the area to identify lek locations and ground surveys to determine the extent of lek use. Data on lek attendance, lek location, and survey dates are provided in Appendix D (Sage Grouse Lek Records).

Specific surveys for sage grouse winter use of the J2PA and surrounding areas were not implemented; however, general sage grouse winter use data were collected by the BLM in association with ongoing activities in the area. This information may be reviewed at the BLM Pinedale Field Office, in Pinedale, Wyoming.

During 2000, TRC Mariah measured noise output, windspeed, and relative humidity at the Bird Canyon and Lumen compressor stations and adjacent areas as requested by the BLM. Noise outputs were measured using a SPER scientific digital sound level meter (Model #840029). Readings were taken at both stations; at approximately 0.4 mi away from the Bird Canyon station to the north, south, east, and west; and at sage grouse leks 7 and 8

(see Appendix A, Wildlife Map, for lek locations). Wind speeds were recorded using a Sims anemometer (Model #95688) at locations where noise output was measured, except directly at the compressor stations. Relative humidity was measured using a Princo sling psychrometer. Readings at the Bird Canyon station and adjacent areas were taken between 6:00 a.m. and 7:00 a.m. on June 1, 2000, and readings at the Lumen station and leks 7 and 8 were taken prior to 6:00 a.m. on June 3, 2000.

On August 5-6, 2000, TRC Mariah biologists mapped habitat types within the MJ2PA to facilitate an analysis of sage grouse nesting habitat quality and quantity. Four habitat types were identified based on an ocular interpretation of relative sagebrush cover and density: dense sagebrush; moderately dense sagebrush; basin sagebrush; and scattered/no sagebrush.

From August 7-10, 2000, sampling was conducted in the dense, moderate, and basin sagebrush types to determine the quality and quantity of sage grouse nesting and brood-rearing habitat in the project area. Sampling procedures generally were based on studies currently being conducted on sage grouse nesting habitat in the area (personal communication, Matt Holloran, University of Wyoming, Cooperative Unit). Shrub cover, density, and height, and understory cover and height were measured along 15 60-m transects in the dense and moderate density sagebrush types and along five transects in the basin sagebrush type (see Appendix A, Habitat Map). Sample points were randomly located using a 60-m grid overlaid on a map of the area and randomly chosen x-y coordinates. The points were located in the field by pacing from recognizable landmarks. At each sample point, a 60-m transect was laid out in a random compass direction. The line-intercept method was used to determine shrub cover along each transect. The length of all live shrubs that intercepted the transect were recorded to the nearest cm by species. The average crown height of each live shrub encountered along the transect was also measured. To ensure consistency within and among habitat types, all cover transects were sampled by the same biologist.

Vegetation and nonvegetation cover were also measured using Daubenmire quadrats. Twelve 0.1-m^2 Daubenmire quadrats were placed along each 60-m transect (one every 5 m), and an ocular estimation of cover was made for overstory and understory at each quadrat. Understory cover values were further divided into grass, forb, subshrub, lichen, moss, cactus, bare ground, litter, and rock. Estimates were calculated based on relative cover such that values totaled 100% for each quadrat. Average height was also estimated for all vegetation classes within each quadrat and, when possible, species were identified and recorded.

Shrub density was estimated by counting the number of shrubs in a 60 x 1-m (60-m^2) belt transect. Shrubs were identified to species, with sagebrush identified to subspecies, when possible, based on shrub height and topographic location.

Data sheets were checked and verified for accuracy and completeness in the field. Data were analyzed using a Microsoft® Excel spreadsheet, and the results were compared with high-quality sage grouse nesting and brood-rearing habitat characteristics as identified in Table 2.1.

2.3 THREATENED, ENDANGERED, PROPOSED, CANDIDATE, AND OTHER WYOMING SPECIES OF CONCERN

Inventory and monitoring of threatened, endangered, proposed, candidate, and other Wyoming species of concern (TEPC&WSC) were conducted in conjunction with surveys for raptors and sage grouse. A list of BLM Wyoming species of concern (draft) for the WSA is provided in Table 2.2. Additional species-specific surveys were implemented by the BLM in conjunction with on-site investigations conducted as components of Application for Permit to Drill (APD) and/or right-of-way (ROW) application processes, as deemed necessary by the BLM and in compliance with the Biological Assessment for the project (BLM 1997, Appendix E). Data collection methods and results/clearances for TEPC&WSC species

Table 2.1 Characteristics of Sagebrush Rangeland Needed for Productive High-quality Sage Grouse Habitat in Wyoming.[1]

Leks/Breeding Habitat (March - Early May)	Vegetation Parameter	Nesting/Early Brood-rearing Habitat (April - June) Height (inches)	Nesting/Early Brood-rearing Habitat (April - June) Canopy Cover(%)[2]	Late Brood-rearing Habitat (June - October) Height (inches)	Late Brood-rearing Habitat (June - October) Canopy Cover(%)[2]	Winter Habitat (November - February) Height Above Snow (inches)	Winter Habitat (November - February) Canopy Cover(%)[2]
The lek is typically an open area surrounded by potential nesting habitat. Leks commonly have less shrub and herbaceous cover than surrounding areas. Sagebrush surrounding the lek provides sage grouse (particularly hens) important hiding cover from predators. The sagebrush cover immediately adjacent to the lek may or may not meet the definition of high-quality nesting/early brood-rearing habitat.	Sagebrush[3]	12-32	15-25	12-32	10-25	10-14	10-30
	Perennial Grass/Forb	>7[4]	>13[5]	Variable (4-inch minimum)	>13	N/A	N/A
	Residual Perennial Grass Cover	4-5	>3[6]	N/A	N/A	N/A	N/A
	Area[7]	>80%	>80%	>40%	>40%	>80%	>80%

1 Adapted from personal communication with Tom Rinkes, BLM Biologist, Lander, Wyoming, November 2000, and based on Connelly et al. in press, Holloran unpublished data, Lyon unpublished data, and Heath unpublished data.

2 Canopy coverage for sagebrush is defined as the percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of the plant. Small openings within the canopy are included.

3 Live plants.

4 Measured as "droop height" of leaves; the highest naturally growing portion of the plant. The height is measured immediately following hatching of chicks and near peak vegetation growth.

5 Optimal cover comprised of approximately 60% perennial grasses and 40% forbs; percent canopy cover should be substantially higher if sagebrush provides little lateral cover. Herbaceous cover should exceed 15% for perennial grasses and 10% for forbs in mesic sagebrush habitats.

6 Residual perennial grass canopy cover should equal or exceed 3% of the total vegetative cover.

7 Percent of seasonal habitat with indicated conditions needed for sage grouse population.

Table 2.2 BLM Wyoming Animal Species of Concern (Draft) Documented or Potentially Occurring on or in the Vicinity of the Jonah II Natural Gas Project Area, 2000.[1]

Species		Other Designation and Ranking: Wyoming Natural Heritage Program; U.S. Forest Service (FS) Regions 2 and 4; Wyoming Game and Fish Department (NSS)[2]	Documented on or in Vicinity of the J2PA?[3]	Habitat Type(s)[4]
Common Name	Scientific Name			
Long-eared myotis	*Myotis evotis*	G5/S1B, S1?N, NSS2	Yes	FT
Whitetail prairie dog	*Cynomys leucurus*	G4/S2S3, NSS3	Yes[5]	UB
Dwarf shrew	*Sorex nanus*	G4/S2S3, FSR2, NSS3	Yes[5]	P/R, BS, SB
Northern goshawk	*Accipiter gentilis*	G5/S23B, S4N, FSR2, FSR4, NSS4	Yes[5]	FT
Peregrine falcon	*Falco peregrinus*	G4/T3/S1B, S2N, FSR2, NSS4	Yes[5]	FT
Ferruginous hawk	*Buteo regalis*	G4/S3B, S3N, FSR2, NSS3	Yes[5]	UB
Burrowing owl	*Athene cunicularia*	G4/S3B, SZN, FSR2, NSS4	Yes[5]	BS, SB, CP
Sage grouse	*Centrocercus*	G5/S3	Yes[5]	UB
Brewers sparrow	*Spizella breweri*	G5/S3B, SZN	Yes[5]	UB
Sage sparrow	*Amphispiza billineata*	G5/S3B, SZN	Yes[5]	UB
Sage thrasher	*Oreoscoptes montanus*	G5/S3B, SZN	Yes[5]	UB
Loggerhead shrike	*Lanius ludovicianus*	G5/S4B, SZN, FSR2,	Yes[5]	UB
Northern leopard frog	*Rana pipiens*	G5/S3, FSR2, NSS4	Yes	P/R
Boreal toad	*Bufo boreas boreas*	G4T4/S2, FSR2, FSR4	Yes	P/R
Spotted frog	*Ranus pretiosa*	G4/S2S3, FSR2, FSR4, NSS4	Yes	P/R

[1] From Draft Wyoming BLM State Director's Sensitive Species List (Animals and Plants), September 2000.

[2] Rankings:

Wyoming Natural Heritage Program

Uses a standardized system developed by The Nature Conservancy's Natural Heritage Network to assess the global and state wide conservation status of each plant and animal species, subspecies, and variety. Each taxon is ranked on a scale of 1-5, from highest conservation concern to lowest. Codes are as follows:

G = Global rank: rank refers to the rangewide status of a species.

T = Trinomial rank: rank refers to the rangewide status of a subspecies or variety.

S = State rank: rank refers to the status of the taxon (species or subspecies) in Wyoming. State ranks differ from state to state.

Table 2.2 (Continued)

1 = Critically imperiled because of extreme rarity (often known from five or fewer extant occurrences or very few remaining individuals) or because some factor of a species' life history makes it vulnerable to extinction.
2 = Imperiled because of rarity (often known from 6-20 occurrences) or because of factors demonstrably making a species vulnerable to extinction.
3 = Rare, or local, throughout its range or found locally in a restricted range (usually from 21-100 occurrences).
4 = Apparently secure, although the species may be quite rare in parts of its range, especially at the periphery.
5 = Demonstrably secure, although the species may be rare in parts of its range, especially at the periphery.
H = Known only from historical records. 1950 is the cutoff for plants; 1970 is the cutoff date for animals.
X = Believed to be extinct.
A = Accidental or vagrant: a taxon that is not known to regularly breed in the state, or which appears very infrequently (typically refers to birds and bats).
B = Breeding rank: a state-rank modifier indicating the status of a migratory species during the breeding season (used mostly for migratory birds and bats).
N = Nonbreeding rank: a state-rank modifier indicating the status of a migratory species during the nonbreeding season (used mostly for migratory birds and bats) ZN or ZB. Taxa that are not of significant concern in Wyoming during breeding (ZB) or non-breeding (ZN) seasons. Such taxa often are not encountered in the same locations from year to year.
U = Possibly in peril, but status uncertain; more information is needed.
Q = Questions exist regarding the taxonomic validity of a species, subspecies, or variety.
? = Questions exist regarding the assigned G, T, or S rank of a taxon.

U.S. Forest Service

Region 2 = Rocky Mountain Region.
Region 4 = Intermountain Region.

Wyoming Game and Fish Department

The Wyoming Game and Fish Department has developed a matrix of habitat and population variables to determine the conservation priority of all native, breeding bird and mammal species in the state. Six classes of native status species (NSS) are recognized, of which classes 1, 2, and 3 are considered to be high priorities for conservation attention. These classes can be defined as follows:

NSS1 = Includes species with on-going significant loss of habitat and with populations that are greatly restricted or declining (extirpation appears possible).
NSS2 = Species in which (1) habitat is restricted or vulnerable (but no recent or significant loss has occurred) and populations are greatly restricted or declining; or (2) species with on-going significant loss of habitat and populations that are declining or restricted in numbers and distribution (but extirpation is not imminent).
NSS3 = Species in which (1) habitat is not restricted, but populations are greatly restricted or declining (extirpation appears possible); or (2) habitat is restricted or vulnerable (but no recent or significant loss has occurred) and populations are declining or restricted in numbers or distribution (but extirpation is not imminent); or (3) significant habitat loss is on-going but the species is widely distributed and population trends are thought to be stable.

[3] Indicates documentation of amphibian, reptile, or bird species in Sublette County (Baxter and Stone 1980; Fertig 1997; WGFD 1999); documentation of bird species within latitude 42°, longitude 109° (Dorn and Dorn 1990; WGFD 1992; WGFD 1996; WGFD 1999); and/or documentation of mammal species within latitude 42°, longitude 109° (WGFD 1992, 1996, 1999) or within Sublette County (Fertig 1997).

[4] BS = big sagebrush, CP = cushion plant, FT = fly through, P/R = pond/riparian, SB = saltbush, UB = ubiquitous.

[5] Species has been documented breeding within latitude 42°, longitude 109° (Dorn and Dorn 1990; WGFD 1992; WGFD 1999).

2.3.1 Black-footed Ferret

Portions of prairie dog town (PDT) 1 on the J2PA were surveyed for black-footed ferrets during 1999 (see Appendix A, Habitat Map, for PDT 1 location). PDT locations, burrow densities, and extent (i.e., acres) were initially described in Anderson (1996); however, during the black-footed ferret survey and subsequent mapping conducted in 2000, all PDTs on the MJ2PA were remapped to more accurately present the current size and location of each town. Additionally, all open burrows within each town were censused to determine the town's suitability as black-footed ferret habitat.

The black-footed ferret survey was conducted using standard nocturnal survey procedures in accordance with USFWS guidelines (USFWS 1989). Further detail on black-footed ferret survey methods can be found in McMurry (1999), which is available for review at the BLM Pinedale Field Office in Pinedale, Wyoming.

2.3.2 Bald Eagle, Ferruginous Hawk, Golden Eagle

Inventory and monitoring protocols for bald eagle, ferruginous hawk, and golden eagle were implemented as described for raptors (see Section 2.1).

2.3.3 Mountain Plover

During 1999, suitable mountain plover breeding and nesting habitat (i.e., areas with low-growing vegetation less than 4 inches high and/or active PDTs) within 0.25 mi of proposed well locations or 300 ft of proposed roads were surveyed/investigated/cleared by the BLM prior to disturbance in association with APD and ROW application field reviews. Data from these surveys/investigations/clearances are available for review at the BLM Pinedale Field Office, in Pinedale, Wyoming.

During 2000, all potential mountain plover breeding habitat on and within 0.5 mi of the MJ2PA was mapped and mountain plover presence/absence surveys were implemented on suitable habitats pursuant to USFWS (1999) guidelines.

Survey protocol was as follows:

- surveys were conducted during the period of May 1-June 15 (i.e,. during early courtship and territory establishment);
- surveys were conducted from sunrise to 10:00 a.m. and/or from 5:30 p.m. to sunset;
- surveys were conducted from four-wheel-drive vehicles or all-terrain vehicles (ATVs);
- surveyors remained in or close to vehicles when scanning with binoculars and/or spotting scopes;
- potential habitats were surveyed three times during the survey window (May 1-June 15), and each survey was separated by at least 14 days;
- surveys were not conducted in inclement weather (e.g., poor visibility); and
- surveys focused on locating displaying or calling males.

2.3.4 Western Burrowing Owl

Prairie dog colonies and other suitable burrowing owl nesting habitats on the MJ2PA were searched during late spring and summer 2000 by TRC Mariah personnel to determine the extent of burrowing owl nesting (see Appendix C, Raptor Nesting Records). Burrowing owl nesting surveys were conducted in association with prairie dog colony mapping, mountain plover surveys, raptor surveys, and vegetation type mapping. The number and location of active nests in the area were identified and efforts were made to determine fledgling success for active nests.

2.3.5 Other TEPC&WSC Species

Formal surveys for other TEPC&WSC were not conducted during 1999 or 2000. However, site-specific investigations were implemented by the BLM in areas of potential habitat within 0.5 mi of proposed disturbance sites during on-site reviews conducted in conjunction with APD and ROW application review processes. This information is available for review at the BLM Pinedale Field Office.

2.4 GENERAL WILDLIFE

Observations of general wildlife were recorded during species-specific investigations, and data are presented in Appendix B. Additional observations were made during on-site investigations conducted during APD and ROW application review processes. Data obtained during these on-site investigations may be reviewed at the BLM Pinedale Field Office.

No formal surveys for pronghorn antelope (i.e., antelope movement/migration studies) or other species/wildlife categories (e.g., waterfowl, predators) were conducted during 1999 or 2000.

3.0 RESULTS AND PROPOSED MONITORING/PROTECTION MEASURES

The following chapter presents the results of 1999 and 2000 wildlife investigations on the WSA. Proposed monitoring/protection measures for 2001 are also identified, and would be implemented by the BLM, WGFD, and/or Operators as identified below.

The proposed wildlife protection measures were developed specifically for potentially impacted wildlife resources on and adjacent to the MJ2PA and J2PA. The principal protection measure proposed for most wildlife species is avoidance of sensitive/crucial habitats (e.g., raptor nests, sage grouse leks), where practical. However, numerous species-specific measures have been identified.

3.1 RAPTORS

3.1.1 Results

Table 3.1 provides information on the location and activity status of raptor nests on the WSA. Active nests are defined as those that have been used within the last 3 years. Information on productivity, nearby project features, and proposed protection measures at active nest sites within affected areas are presented in Table 3.2. Twenty-five of 97 known raptor nest sites on and adjacent to the WSA were known to be active between 1998 and 2000. Fifty-seven of the nest sites on and adjacent to the WSA are ferruginous hawk nests, eight of which were known to be active during the 1998-2000 period (Table 3.1). American kestrel have 10 known nest sites on the WSA, six of which were active during the period. Other species with known nests on the WSA include burrowing owl (six nests, four active), golden eagle (five nests, three active), and prairie falcon (seven nests, three active). Twelve nests of unknown species were identified on the WSA during pre-1996 surveys; however, only one of these nests was located (active) during subsequent raptor surveys, and it is likely, based on mapped locations and the inability to relocate the nests, that the other 11 nests are not present within the WSA.

Table 3.1 Raptor Nest Locations and Activity Status, 2000, Jonah II Wildlife Study Area.

Nest Number[2]	Activity Status[3]	Activity by Year[1]			Most Recent Activity	Legal Location
		2000	1999	1998		
AK16	A	I	a	I	1999	
AK17	A	I	a	I	1999	
AK18	A	I	a	a	1999	
AK30	A	a	a	A	2000	
AK39	U	I	NC	I	1997[5]	
AK52	A	I	I	A	1998	
AK80	U	I	I	NR	U	
AK88	A	a	NR	NR	2000	
AK92	U	U	NR	NR	U	
AK97	U	U	NR	NR	U	
BO19	U	I	NC	NC	1997[5]	
BO23	U	I	NC	NC	1997[5]	
BO75	A	NC	NC	a	1998[5]	
BO76	A	I	NC	a	1998[5]	
BO77	A	A	A	NR	2000	
BO86	A	A	NR	NR	2000	
FH1 (2 nests)	I	I	I	I	U	
FH2	I	I	I	I	U	
FH3	U	NC	I	NC	U	

Table 3.1 (Continued)

Nest Number[2]	Activity Status[3]	Activity by Year[1] 2000	1999	1998	Most Recent Activity	Legal Location
FH4	A	A[6]	A	I	2000	
FH5	I	I	I	I	pre-1996	
FH6	I	I	I	I	pre-1998	
FH7	I	I	I	I	pre-1998	
FH8	I	I	I	I	1996	
FH9	I	I	I	I	pre-1998	
FH10	I	I	I	I	pre-1998	
FH11	I	I	I	I	pre-1996	
FH12 (2 nests)	I	I	I	I	pre-1997	
FH13	I	I	I	I	pre-1998	
FH14	A	I	A[7]	I	1999	
FH15	I	I	I	I[8]	1999	
FH20	I	I	I	I	pre-1997	
FH21	I	I	I	I	pre-1997	
FH22	I	I	I	I	pre-1998	
FH24	A	a	I	NC	2000	
FH25	I	I	I	I	pre-1998	
FH26 (3 nests)	A	a	a	I	2000	

Table 3.1 (Continued)

Nest Number[2]	Activity Status[3]	Activity by Year[1]			Most Recent Activity	Legal Location
		2000	1999	1998		
FH28	U	I	I	NC	1996[5]	
FH29	U	I	I	NC	pre-1996[5]	
FH37 (2 nests)	A	I	A	A	1999	
FH38	A	A	NC	I	2000	
FH42	I	I	I	I	pre-1998	
FH43 (2 nests)	I	I	I	I	pre-1998	
FH53	A	I	I	A	1998	
FH54 (2 nests)	I	I	I	I	pre-1998	
FH55	I	I	I	I	pre-1998	
FH56	I	I	I	I	pre-1997	
FH57 (2 nests)	I	I	I	I	pre-1997	
FH58	U	NC	I	I	pre-1998	
FH59 (3 nests)	I	I	I	I	pre-1997	
FH60	I	I	I	I	pre-1997	
FH62	I	I	I	I	pre-1997	
FH64	U	I	I	NC	pre-1997	

Table 3.1 (Continued)

Nest Number[2]	Activity Status[3]	Activity by Year[1]			Most Recent Activity	Legal Location	UTM Coordinates[4]
		2000	1999	1998			
FH65	I	I	I	I	pre-1997		
FH66 (2 nests)	I	I	I	I	pre-1997		
FH67	I	I	I	I	pre-1998		
FH68	I	I	I	I	pre-1997		
FH69	A	a	I	I	2000		
FH70	I	I	I	I	pre-1998		
FH71	I	I	I	I	1997		
FH73	I	I	I	I	pre-1996		
FH78	U	I	I	NR	U		
FH82	U	NC	I	NR	U[5]		
FH83	U	I	I	NR	U		
FH84	U	I	I	NR	U		
FH85 (2 nests)	U	I	I	NR	U		
FH87	U	I	NR	NR	U		
FH89	U	I	NR	NR	U		
FH90	U	I	NR	NR	U		
FH91	U	U	NR	NR	U		
FH93	U	I	NR	NR	U		

Table 3.1 (Continued)

Nest Number[2]	Activity Status[3]	Activity by Year[1]			Most Recent Activity	Legal Location	UTM Coordinates[4]
		2000	1999	1998			
FH95 (4 nests)	U	I	NR	NR	U		
FH96	U	I	I	NR	U		
GE36	A	A	I	I	2000		
GE47 (2 nests)	A	A	I	A	2000		
GE48	I	I	I	I	pre-1996		
GE51	A	A	I	I	2000		
GE72	I	I	I	I	pre-1998		
PF27	U	I	I	U	1997[5]		
PF41	A	U	U	A[8]	1998[5]		
PF61	I	I	I	I	1997		n/a
PF63	I	I	I	I	pre-1998		n/a
PF79	A	I	A	NR	1999		n/a
PF81	A	A	a	NR	2000		n/a
PF94	U	I	NR	NR	U		n/a
UN31	I[9]	NC	NC	NC	U		n/a
UN32	I[9]	NC	NC	NC	U		n/a
UN33	I[9]	NC	NC	NC	U		n/a
UN34	I[9]	NC	NC	NC	U		n/a

Table 3.1 (Continued)

Nest Number[2]	Activity Status[3]	Activity by Year[1] 2000	1999	1998	Most Recent Activity	Legal Location	UTM Coordinates[4]
UN35	I[9]	NC	NC	NC	U	[redacted]	n/a
UN40	I[9]	NC	NC	NC	U	[redacted]	n/a
UN44	I[9]	NC	NC	NC	U	[redacted]	n/a
UN45	I[9]	NC	NC	NC	U	[redacted]	n/a
UN46	I[9]	NC	NC	NC	U	[redacted]	n/a
UN49	I[9]	NC	NC	NC	U	[redacted]	n/a
UN50	A	I	a[10]	I	1999	[redacted]	[redacted]
UN74	U	I	I	NC	U	[redacted]	n/a

[1] A = active; a = likely active; I = inactive; NC = not checked/not located; NR = nest had not yet been recorded; U = unknown.
[2] FH1 = ferruginous hawk nest 1; AK16 = American kestrel nest 16; BO19 = burrowing owl nest 19; GE36 = golden eagle nest 36; PF27 = prairie falcon nest 27; UN31 = unknown species nest 31.
[3] Overall activity status is based on the BLM definition of an active nest as one which has been active in at least 1 of the past 3 years. For overall activity status, nests for which activity was likely, but not confirmed, were considered active (A). Nests which were assigned an unknown activity status (U) lack a conclusive activity determination for at least 1 of the past 3 years and/or were newly recorded and have not been monitored for 3 consecutive years. Nests confirmed inactive in all of the past 3 years are deemed inactive (I).
[4] E = easting; N = northing; n/a = not available.
[5] Date is of last confirmed activity, but activity status was unknown in at least 1 of the past 3 years; thus, more recent activity may have occurred.
[6] Used by prairie falcon.
[7] Used in 1999 by golden eagle.
[8] Used by common raven.
[9] Detailed searches for these nests in 1999 and 2000 found no raptor activity in the area of the mapped nest sites; therefore, nests were assumed to be inactive.
[10] Possibly used by great horned owl or prairie falcon.

Table 3.2 Summary of Active Raptor Nests Within 1.0 Mi of Existing or Proposed Disturbance, Jonah II Wildlife Study Area.[1]

Species/ Nest No.[2,3]	Legal Location	Nest Condition	Seasonal Buffer Radius	Nest Production[4]			Nearby Project Features[5]	Mitigation/Actions[6]
				Eggs	Nestlings	Fledglings		
AK16	[redacted]	Unknown	0.5 mi	0	0	0	Numerous existing and proposed project features within 0.5 mi	Continue activity status and productivity monitoring
AK17	[redacted]	Unknown	0.5 mi	0	0	0	Numerous existing and proposed project features within 0.5 mi	Continue activity status and productivity monitoring
AK18	[redacted]	Unknown	0.5 mi	0	0	0	Numerous existing and proposed project features within 1.0 mi	Continue activity status and productivity monitoring
BO75	[redacted]	Unknown	0.5 mi	U	U	U	Numerous existing and proposed project features within 0.5 mi	Continue activity status and productivity monitoring
BO77	[redacted]	Unknown	0.5 mi	U	U	1, 1999	Numerous existing and proposed project features within 1.0 mi	Continue activity status and productivity monitoring
FH4[7]	[redacted]	Unknown	1.0 mi	3, 1999	2 (1 died), 1999	1 (died), 1999	One proposed well pad within 1.0 mi	Continue activity status and productivity monitoring; if territory 6 is inactive in 2001, potential development of ANS(s)
FH14[8]	[redacted]	Good	1.0 mi	3, 1997 1, 1999 - egg failed	U U	2, 1997 U	Numerous existing and proposed project features within 1.0 mi; limited alternative nest sites available in territory 5	Continue activity status and productivity monitoring; if territory 5 is inactive in 2001, potential development of ANS(s)
FH24	[redacted]	Destroyed	1.0 mi	0	0	0	Numerous proposed features within 1.0 mi; limited alternative nest sites	Continued monitoring the area for new and active nests
FH53	[redacted]	Good	1.0 mi	3 (1 didn't hatch), 1998	2, 1998	2, 1998	Burma Road within 0.5 mi	Continue activity status and productivity monitoring
FH69	[redacted]	Good	1.0 mi	0	0	0	Road and pipeline occur within 1.0 mi	Continue activity status and productivity monitoring

1 Active nests defined by activity or likely activity in at least one of the past three nesting seasons. See Appendix B, Raptor Nesting Records, for further detail.
2 See Appendix A, Wildlife Map, for nest locations.
3 FH = ferruginous hawk (see Table 3.3 for nesting territory); AK = American kestrel; BO = burrowing owl.
4 Presents number of items and year; U = unknown.
5 See Appendix A, Project Features Map.
6 Seasonal and standard avoidance measures are not included since they would be applied as necessary for all active nests.
7 Used by prairie falcon in 2000.
8 Used by golden eagle in 1999.

Since several active raptor nests on the area occur at distances greater than 1 mi from existing and proposed oil and gas disturbance sites (and thus, productivity monitoring is not required), productivity data for some nests are limited (see Appendix C). Ferruginous hawk nests in the WSA are known to have produced two fledglings in 1998, one in 1999, and none in 2000. Ferruginous hawk nest 4 was active in 1999 and produced two young--both of which died--one as a nestling, and one as a fledgling. A definitive cause for nest failure was not identified, but the dead fledgling was found decapitated. In 2000, the nest was used by prairie falcons, and appeared to produce no fledglings.

Nest productivity for other raptor species during 1999 and 2000 include three burrowing owl fledglings (one in 1999, two in 2000 [nests >1.0 mi from disturbance]); additional burrowing owl young may have fledged from other known nests in the area. Golden eagles fledged three to four young in 2000 (nests >1.0 mi from disturbance). American kestrels and prairie falcon also had active nests in the area during the period and likely fledged young birds.

The approximate locations of ferruginous hawk nest territories present on and adjacent to the WSA are shown on the Wildlife Map in Appendix A and briefly described in Table 3.3. An estimated 11 nesting territories are present on the WSA, six of which have been occupied at least once during the last 3 years (1998-2000). Project features proximal to the active nests in these territories are identified in Table 3.2 and Appendix A (Project Features Map). Project features/developments on the J2PA exist and are further planned proximal to nest territories 5, 6, and 7. Other activities (e.g., recreational activities/off-road vehicle use, livestock grazing, wildlife/predator interactions, climate) likely occur and will continue to occur in these and other territories. Ferruginous hawk nesting territory 7 was not active during the 3-year period and all known nest sites in the territory are at suboptimal locations (i.e., on the ground surface with easy access by predators); therefore, nesting in territory 7 is unlikely to occur in all but the most active nesting years (i.e., when all other nearby nesting territories are occupied). It is also possible that nest territories 5, 6, and 7 and nest site 24 will remain unused or will have limited success during the life of the Jonah II Field.

Table 3.3 Nests and 1998-2000 Activity Status at Ferruginous Hawk Nesting Territories, Jonah II Wildlife Study Area.[1]

Territory	Nests Included in Territory[2]	Activity Status[3]		
		1998	1999	2000
1	68-71	I	I	A (unknown success)
2	62, 64-67, 84-85, 96	I	I	I
3	56-58, 60, 83	I	I	I
4	26, 28-29, 95	I	I	A (unknown success)
5	13-15	I	A[4] (failed)	I
6	2-12, 78	I	A (failed)	A[5] (unknown success)
7	20-21, 73	I	I	I
8	53-55, 82	A (2 fledged)	I	I
9	42-43	I	I	I
10	37-38	A (unknown success)	A (unknown success)	A[5] (unknown success)
11	59, 90	I	I	I

[1] See Appendix A, Wildlife Map, for locations.
[2] No nesting territory is established for nests 1, 22, 24, 25, and 91.
[3] Further detail is provided in Appendix C, Raptor Nesting Record; I = inactive; A = active.
[4] Used by golden eagle.
[5] Used by prairie falcon.

Mitigation measures as defined in Section 3.1.2 are recommended for territories 5 and 6 in 2001.

Project facilities are proposed for development within 0.5 mi of three active American kestrel nests and two active burrowing owl nests (see Table 3.2). Continued monitoring efforts are proposed for these nest sites (see Section 3.1.2).

3.1.2 Monitoring/Protection Measures

The primary mitigation measure for raptor species on the WSA is avoidance of active nest locations during the breeding season. Active nests are defined as raptor nests that have been used within the last 3 years. Unless excepted by the BLM during APD and ROW application reviews, all surface-disturbing activities will be restricted from February 1 through July 31 within a 0.5-mi radius of active raptor nests, except ferruginous hawk nests, for which the seasonal buffer will be 1.0 mi (see Table 3.2). In addition, well locations, roads, ancillary facilities, and other surface structures requiring repeated human presence will not be constructed within 825 ft of active raptor nests, where practical. The seasonal buffer distance and exclusion dates may vary depending on factors such as nest activity status, raptor species, prey availability, natural topographic barriers, and line-of-sight distances.

Nest activity status and productivity monitoring will continue in 2001 as identified in the ROD (BLM 1998a [Appendix E], BLM 2000b). Nest activity status will be monitored from the ground. Additionally, unknown nests 31-35, 40, 44-46, and 49 are recommended for removal from maps and further monitoring.

In 2001, nest/nest area photos will be taken of all raptor nest locations for which photos are lacking (Table 3.4) (see Appendix C, Raptor Nest Records).

Table 3.4 Raptor Nest Locations for Which Photos are Needed, Jonah II Wildlife Study Area, 2000.

Species	Nest Numbers
American kestrel	17, 30, 39, 52, 88, 92, 97
Burrowing owl	19, 23, 75, 76, 77, 86
Ferruginous hawk	1 (2 nests), 2, 3, 5, 6, 7, 11, 22, 28, 29, 37, 38, 42, 70, 78, 82, 89, 91, 93, 95 (4 nests)
Golden eagle	48
Prairie falcon	27, 41, 94
Unknown	74

Well locations, roads, ancillary facilities, and other surface structures requiring repeated human presence will not be constructed within 825 ft (2,000 ft for bald eagles) of active raptor nests, where practical. Facility construction in these areas will require specific approval from the BLM wildlife biologist and Authorized Officer.

Operators will notify the BLM immediately if raptors are found nesting on project facilities. If nest manipulation or a situation requiring a "taking" of a raptor nest becomes necessary, a special permit will be obtained from the Denver USFWS Office, Permit Section. Permit acquisition will be coordinated with the Wyoming State USFWS Office in Cheyenne and will be initiated with sufficient lead time to allow for development of mitigation measures. Required corresponding permits will be obtained from the WGFD in Cheyenne. Consultation and coordination with the USFWS and WGFD will be conducted for all mitigation activities relating to raptors.

Because project development continues on and adjacent to active ferruginous hawk territories 5 and 6, it is recommended that two artificial nesting structures (ANSs) be established within or adjacent to these territories in 2001 if the territories remain inactive

or unproductive during 2001. Operators will assist the BLM (in consultation with other land users) as necessary in locating appropriate ANS sites and erecting ANSs. It is recommended that ANSs be established outside of existing and known future disturbance areas. The low-lying areas in Section 33, T29N, R107W appear to provide suitable areas for ANS locations in territory 6. ANS construction and maintenance activities will be completed between August 1 and September 15, 2001. Operators will be responsible for the annual maintenance of ANSs throughout the life-of-project, and all ANSs on public lands will become the property of the BLM upon completion of the project. Additional mitigations for nesting raptors would be designed on a site-specific basis, as necessary, in consultation with the BLM, USFWS, and WGFD.

In future years, additional ANSs may be constructed (up to two ANSs for each impacted nest) or existing, degraded raptor nests may be upgraded/reinforced to mitigate potential impacts. The location of ANSs or nests proposed for upgrading will be identified in annual reports. ANSs will be located within or proximal to potentially affected nesting territories, outside of the line-of-sight or nest buffer of actively nesting raptor pairs, and at sites sufficiently removed from development activities to minimize or avoid potential adverse effects.

In cases where existing project features (e.g., well locations) are located within the buffer areas for active raptor nests, no extensive maintenance activities (e.g., workovers) will be allowed during critical periods (i.e., approximately early March through mid-June). The exact dates of exclusion will be determined by the BLM and specified in Conditions of Approval for APD and ROW applications, and will likely vary among nests and from year-to-year depending upon the raptor species and variations in weather, nesting chronology, and other factors.

3.2 SAGE GROUSE

3.2.1 Results

Table 3.5 presents a summary of recent sage grouse lek use (1998-2000), nearby project features, and proposed monitoring and other actions for leks on the WSA (see Appendix D, Sage Grouse Lek Records, for further detail). Table 3.6 presents historic information on lek use since 1992. Lek 16 was not surveyed during the period; therefore, no data on lek use are presented.

Of the 22 known leks on the WSA, leks 1, 2, 3, 7, 9, 10, 17, 18, 19, 21, and 22 have shown considerable use during monitoring, and no notable declines in use were identified (Table 3.6 and Appendix D, Sage Grouse Lek Records). Decreasing attendance has been observed at lek 4, with maximum male attendance down from 16 in 1994 to one in 2000, and due to the extent of nearby project development, this lek may continue to have low levels or no use throughout the remainder of project development. No males were observed at leks 5, 6, 8, 11, 12, 13, 14, or 15 in the last 3 to 4 years (Table 3.6), and these leks also may continue to be unused for the remainder of project development.

Five new leks were located during 1999 (leks 17 and 18) and 2000 (leks 19, 21, and 22).

Noise monitoring at leks 7 and 8 on the WSA and the lek near the Bird Canyon compressor station are provided in Table 3.7

Habitat mapping of the MJ2PA during 2000 primarily conducted to assist in defining optimal sage grouse nesting and brood-rearing areas found that dense sagebrush was the most common habitat type, occupying approximately 89% (26,582 acres, 41.5 mi^2) of the MJ2PA (see Appendix A, Habitat Map). This habitat type generally occurs in flat to rolling terrain and exhibits sagebrush cover of >20% (Table 3.8). Wyoming and mountain big

Table 3.5 Summary of Sage Grouse Lek Use, Potential Impacts, and Proposed Monitoring, Jonah II Wildlife Study Area, 2000.[1]

Lek No.[2]	Approximate Location	Status[3]	Use	Nearby Project Features[4]	Monitoring/Other Actions[5]
1	[redacted]	A	Relatively consistent	One existing and numerous proposed wells and roads within 1.0 mi; one proposed location within 0.25 mi	Monitor attendance three times in 2001; move proposed well outside 0.25-mi buffer
2	[redacted]	A	Relatively consistent	Existing pipeline within 0.25 mi; numerous existing and proposed wells and roads within 1.0 mi	Monitor attendance three times in 2001; ensure proposed wells and roads are outside 0.25-mi buffer
3	[redacted]	A	Relatively consistent	Proposed well and road within 0.25 mi; one existing and another proposed well and road within 1.0 mi	Monitor attendance three times in 2001; move proposed well and road to outside 0.25-mi buffer
4	[redacted]	A	Decreasing maximum male attendance since 1996	One existing and two proposed wells and roads within 0.25 mi; numerous proposed and existing wells, pipelines, and roads within 1.0 mi	Monitor attendance three times in 2001; move proposed wells and roads to outside 0.25-mi buffer
5	[redacted]	I	No known use since pre-1997	Existing well pipelines and roads within 0.25 mi; new wells proposed within 0.25 mi; proposed and existing wells, pipelines, and roads within 1.0 mi	Discontinue monitoring
6	[redacted]	I	No known use since pre-1997	Existing road at lek	Discontinue monitoring
7	[redacted]	A	Relatively consistent	Existing pipeline within 1.0 mi	Monitor attendance three times in 2001; monitor noise levels in 2001; GPS lek perimeters in 2001
8	[redacted]	I	No known use since pre-1997	Existing pipeline and road and one proposed well within 1.0 mi	Discontinue monitoring
9	[redacted]	A	Relatively consistent	Proposed well within 1.0 mi	Monitor attendance three times in 2001; GPS lek perimeters in 2001
10	[redacted]	A	Relatively consistent	Existing and proposed wells and roads within 1.0 mi	Monitor attendance three times in 2001; monitor noise levels in 2001
11	[redacted]	I	No known use since pre-1994	Proposed road within 0.25 mi; proposed wells and roads within 1.0 mi	Discontinue monitoring in 2001; move proposed road to outside 0.25-mi buffer?

Table 3.5 (Continued)

Lek No.[2]	Approximate Location	Status[3]	Use	Nearby Project Features[4]	Monitoring/Other Actions[5]
12	[redacted]	I	Limited use since pre-1992	Existing well and roads within 1.0 mi	Monitor attendance three times in 2001; search for alternate nearby lek sites in 2001; if no use, discontinue monitoring in 2002?
13	[redacted]	I	No known use since pre-1996	None	Discontinue monitoring?
14	[redacted]	I	No known use since pre-1992	Existing road within 1.0 mi	Discontinue monitoring?
15	[redacted]	I	No known use since pre-1997	Existing and proposed wells, pipelines, and roads within 0.25 mi	Discontinue monitoring in 2001
16	[redacted]	U	Unknown	None	Monitor attendance three times in 2001?
17	[redacted]	A	Relatively consistent since 1999 (first located in 1999)	Proposed road within 1.0 mi	Monitor attendance three times in 2001; GPS lek perimeters in 2001
18	[redacted]	A	Possible increased attendance since 1999 (first located in 1999)	Existing road within 0.25 mi; proposed well and road within 1.0 mi	Monitor attendance three times in 2001
19	[redacted]	A	First located in 2000	None	Monitor attendance three times in 2001; GPS lek perimeters in 2001
20	[redacted]	U	Unknown	Existing road within 0.25 mi	Monitor attendance three times in 2001; GPS lek perimeters in 2001
21	[redacted]	A	First located in 2000	Proposed well and road within 1.0 mi	Monitor attendance three times in 2001; GPS lek perimeters in 2001
22	[redacted]	A	First located in 2000	Proposed wells and roads within 1.0 mi	Monitor attendance three times in 2001; GPS lek perimeters in 2001

1 See Appendix A, Wildlife Map and Appendix D, Sage Grouse Lek Records for additional information.
2 See Table 3.6 for alternate names.
3 A = active (at least once during last 3 years); I = inactive; U = unknown.
4 See Appendix A, Project Features Map.
5 Seasonal and standard avoidance measures are not included since they would be applied as necessary for all leks; ? = monitoring action not necessarily required.

Table 3.6 Sage Grouse Trends, Jonah II Wildlife Study Area, 1992-2000.[1]

Lek No.	Lek Name	History[2]								
		1992	1993	1994	1995	1996	1997	1998	1999	2000
1	4-2	NS	NS	9	NS	26	6	31	25	22
2	4-6	NS	NS	2	NS	2	17	12	7	14
3	Sand Draw Reservoir	NS	NS	NS	NS	16	0	36	26	22
4	Clay Hill	NS	NS	16	NS	15	4	4	0	1
5	4-8	NS	NS	NS	NS	1	0	0	0	NS
6	4-9	NS	NS	NS	NS	3	0	0	0	0
7	4-7	NS	NS	36	NS	0	16	17	11	9
8	4-10	NS	NS	NS	NS	2	0	0	0	0
9	Alkali Draw	NS	NS	NS	NS	NS	50	26	62	47
10	The Rocks	NS	NS	NS	NS	NS	60	53	79	64
11	4-5	NS	NS	0	NS	0	NS	0	0	0
12	3-8	1	0	0	0	1	4	0	0+	0
13	3-6	NS	NS	NS	NS	0	0	0	0	0
14	3-7	0	0	0	0	0	0	0	0	0
15	Sand Draw	NS	NS	NS	NS	1	0	0	0	0
16	Long Draw	UNK	UNK	UNK	UNK	UNK	UNK	UNK	UNK	UNK
17	Buckhorn Well #1	NS	NS	NS	NS	NS	NS	NS	5	3
18	Shelter Cabin Reservoir	NS	NS	NS	NS	NS	NS	NS	50+	90
19	Prairie Dog Town 5	NS	NS	NS	NS	NS	NS	NS	NS	9
20	Upper Alkali Creek	NS	NS	0	NS	0	NS	NS	NS	NS
21	South Rocks	NS	NS	NS	NS	NS	NS	NS	NS	10
22	Antelope State	NS	NS	NS	NS	NS	NS	NS	NS	9

[1] Further detail is provided in Appendix D, Sage Grouse Lek Records.

[2] Numbers refer to maximum male attendance; NS = not surveyed; UNK = unknown; + = unclassified birds observed but not included.

Table 3.7 Summary of Noise Data Collection at the Bird Canyon and Lumen Compressor Stations, Jonah II Wildlife Study Area, 2000.

Location	Time	Noise Output[1] (decibels)	Windspeed	Relative Humidity
Bird Canyon Compressor Station	**June 1, 2000**			
0.4 mi to north	6:00 to 7:00 a.m.	37.2 - 50.1 (43.70)	5 mph from SW	26%
0.4 mi to south	6:00 to 7:00 a.m.	41.3 - 54.5 (47.90)	3 mph from SW	26%
0.4 mi to east	6:00 to 7:00 a.m.	48.0 - 51.4 (49.70)	2 mph from SW	26%
0.4 mi to west	6:00 to 7:00 a.m.	36.7 - 46.5 (41.60)	4 mph from SW	26%
Directly at Station	6:00 to 7:00 a.m.	73.1 - 74.6 (73.85)	--	--
Lumen Compressor Station	**June 3, 2000**			
Lek #7	5:57 a.m.	36.9 - 42.4 (39.65)	3 mph from NW	15%
Lek #8	5:37 a.m.	39.5 - 53.5 (46.50)	5 mph from NW	15%
Directly at Station	--	65.2 - 66.7 (65.95)	--	--

[1] All noise output readings represent a decibel range between the minimum and maximum values recorded during a 2- to 3-minute interval at each particular sampling location. Average outputs fall near the medians. Numbers in parentheses are median values.

sagebrush (*Artemisia tridentata wyomingensis* and *A. t. vaseyana*, respectively) are the most common shrub species, with rabbitbrush (*Chrysothamnus* spp.) also present. Subshrubs in this habitat type include granite prickly gilia (*Leptodactylon pungens*), broom snakeweed (*Gutierrezia sarothrae*), and winterfat (*Kraschenninikovia lanata*), which is generally uncommon. Forbs include stemless goldenweed (*Happlopappus acaulis*), Hood's phlox (*Phlox hoodii*), and miner's candle (*Cryptantha* spp.), and grass species include wheatgrasses (*Agropyron* spp.), Indian ricegrass (*Oryzopsis hymenoides*), fescue (*Festuca* sp.), and needleandthread (*Stipa comata*).

The moderate density sagebrush type (9% of the MJ2PA, 2,605 acres, 4.1 mi^2) is most commonly found in the southeastern portion of the project area, where it typically occurs

Table 3.8 Results of Vegetation Studies, MJ2PA, 2000.[1]

Parameter	MJ2PA Vegetation Type[2]			Productive Sage Grouse Habitat Characteristics[3]	
	Dense Sagebrush (n=15)	Moderate Density Sagebrush (n=15)	Basin Sagebrush (n=5)	Nesting/Early Brood-rearing	Late Brood-rearing
Sagebrush height (inches)	9.8	7.9	31.0[4, 5]	12-32	12-32
Percent sagebrush cover					
Daubenmire	21.7[4, 5]	6.5	30.8	15-25	10-25
Line intercept	24.5[4, 5] (99%)	7.9 (89%)	36.7 (79%)	--	--
Percent total shrub cover					
Daubenmire	22.0	6.8	31.4	--	--
Line intercept	24.7 (99%)	8.1 (92%)	38.0 (80%)	--	--
Grass/forb height (inches)	5.6	6.5	6.5	>7.0	Variable/ 4-inch minimum
Percent grass and forb cover	10.6 (89%)	15.1[4, 5] (96%)	20.1[4,5] (65%)	>13	>13
Residual grass height (inches)[6]	6.3	6.1	6.5	4-5	--
Percent residual grass cover	8.5[4]	10.9[4]	20.1[4]	>3	--
Sagebrush plants/ acre	7,260 (99%)	2,636 (92%)	4,494 (86%)	--	--
Total shrubs/acre	7,665 (99%)	2,951 (96%)	5,088 (91%)	--	--

1 Data on file at TRC Mariah, Laramie, Wyoming; measurements recorded in late summer.

2 See Appendix A, Habitat Map, for locations. Numbers in parentheses are the confidence level achieved with 80% precision using the z statistic derived from the following formula: $\frac{\sqrt{n(d\bar{x})^2}}{s}$

where:

n = sample size
d = 0.2 (for 80% precision)
$\bar{x}$ = sample mean
s = sample standard deviation.

3 See Table 2.1 for references; measurements recorded during late spring/early summer.

4 Meets nesting/early brood-rearing characteristics.

5 Meets late brood-rearing characteristics.

6 Excludes pre-2000 litter in MJ2PA samples.

on sideslopes. It is characterized by an average of approximately 6-8% sagebrush cover (Table 3.8), with spiny hopsage (*Grayia spinosa*) and scattered rabbitbrush also present. Subshrubs include snakeweed, Gardner's saltbush (*Atriplex gardneri*), and winterfat. Grass and forb species composition is generally similar to that observed in the dense sagebrush type.

The basin sagebrush (*Artemisia tridentata tridentata*) type (<1% of the MJ2PA, 236 acres, 0.4 mi^2) is characterized by a narrow strip of tall, dense basin sagebrush along the Sand Draw drainage (see Appendix A, Habitat Map). Understory is relatively sparse with some scattered rabbitbrush and mixed grasses and forbs.

Scattered/no sagebrush habitat (2% of the MJ2PA, 575 acres, 0.9 mi^2) occurs in small pockets within the project area (see Appendix A, Habitat Map). These unsampled areas are generally associated with playas, rocky outcrops, or steep slopes, and they typically grade into the moderate density sagebrush habitat type.

Measured vegetation parameters within the three sampled vegetation types in the MJ2PA were in no instance consistent with the qualitative and quantitative parameters for productive sage grouse nesting or brood-rearing described in Table 3.8. However, the dense sagebrush and basin sagebrush types in combination apparently provide adequate conditions (with the exception of understory grass/forb and residual grass heights) for sage grouse nesting, since sage grouse nesting and brood-rearing is known to occur in the area. Furthermore, since year 2000 vegetation sampling in the MJ2PA occurred late in the summer during a dry year, and whereas sampling to determine productive nesting and brood-rearing habitat parameters occurred immediately following chick hatching (late spring/early summer), it is likely that some portion of the understory (grasses and forbs) was lost to desiccation and wind and/or grazing, resulting in the potential for underestimation of both cover and height of grasses and forbs during the year 2000 vegetation sampling.

3.2.2 Monitoring and Protection Measures

Monitoring and identification of sage grouse leks on the WSA will continue in 2001 as specified in the WMPP (BLM 1998a, Appendix E) and the EA for the Modified Jonah Field II Project (BLM 2000b).

It is recommended that the WGFD or BLM continue to implement aerial (fixed wing) sage grouse lek inventories of the WSA in 2001 to provide further lek locational data and to identify any new or previously undiscovered leks. Additionally, WGFD and/or BLM will use GPS to determine lek perimeters in 2001 at leks 7, 9, 17, 19, 20, 21, and 22. Aerial surveys will be implemented during March/April. The absence of/decreased use of leks 4, 5, 6, 8, 11, 12, 13, 14, and 15 may indicate that alternate lek sites are being used; therefore, it is recommended that additional observations be made in 2001 in the vicinity of these leks to locate any new, unmapped leks.

Due to the apparent lack of use over the last few years at leks 5, 6, 8, 11, 12, 13, 14, and 15, it is recommended that lek attendance monitoring at these leks be discontinued in 2001. Attendance monitoring at these leks may be reinitiated once field development is complete. Attendance monitoring of other known sage grouse leks in the area by WGFD and/or BLM personnel will continue in 2001 as during past years and specified in the ROD (BLM 1998a, Appendix E) and deemed necessary by the BLM and WGFD.

As requested by the BLM and WGFD, noise monitoring will be implemented in 2001 at leks 7 and 10 within the WSA and at the Bird Canyon lek located approximately 0.4 mi southeast of the Bird Canyon Compressor Station, southwest of the WSA. Continuous noise monitoring will be conducted from 5 a.m. to 9 a.m. on four separate occasions during the period of March 15-April 30 at the three leks. Noise monitoring equipment will include a Bruel & Kjaer Model 2260 precision integrating sound meter and octave band analyzer (noise frequency) with a data logger (meets ANSI 51.4-1983 Type 1 sound level meter

requirements). Noise measurements will be logged every 5 minutes over the duration of the 5-hour sampling period, and data will be downloaded daily for storage and analysis. The meter will be calibrated daily with a Bruel & Kjaer Model 4231 sound level calibrator. The microphone will be fitted with a windscreen to reduce wind-generated noise and will be mounted at the edge of each lek approximately 3 ft above the ground. Contributing noise sources will be identified and recorded, as well as prevailing meteorological conditions (i.e., wind speed and direction, temperature, humidity, and cloud cover).

As with raptors, the principal protection for sage grouse is avoidance of leks during the breeding season and the avoidance of probable nesting areas during the nesting season. If an active sage grouse nest is identified during the nesting season (April 1 - July 31), surface-disturbing activities will be delayed until nesting is completed.

All surface-disturbing activities, including pipeline construction, will be avoided within 0.25 mi of active sage grouse leks, and no permanent high profile structures such as buildings and storage tanks which are suitable raptor perches will be constructed within 0.25 mi of any lek. Therefore, the proposed project features (i.e., well locations, roads, pipelines) proximal to leks 1, 3, 4, 5, 11, and 15 may require relocation to sites greater than 0.25 mi from the lek centers. Well location and road and pipeline construction within 0.25 mi of leks 5, 11, and 15 may be permitted in 2001 (as authorized by BLM) since these leks have exhibited little or no use during monitoring and are considered inactive.

Operators will restrict construction activities between March 1 and June 30 within a 2.0-mi radius of active sage grouse leks to protect sage grouse nesting habitat, and will avoid all drilling and construction activities from March 1 to May 15 on all areas within 1.0 mi of active sage grouse leks to protect sage grouse breeding activities. Operators will also maintain a 0.5-mi disturbance-free buffer around leks 7 and 8 south of the MJ2PA (see Appendix A, Wildlife Maps).

While Operators have committed to avoiding optimal sage grouse nesting habitat during the nesting period, where practical (BLM 2000b), no optimal (productive) habitat has been identified in the MJ2PA (see Table 3.8). However, since sage grouse nesting and brood-rearing is known to occur in the sagebrush-dominated habitats on the area, it is recommended that no disturbance (other than linear crossings) be authorized within the basin sagebrush type (this type is currently protected by drainage buffers [see Appendix A, Habitat Map]), and that disturbance within the dense sagebrush type be avoided during the nesting period.

It is recommended that the BLM implement formal sage grouse winter use investigations on the J2PA and a 0.5-mi buffer during late winter (January/February) 2001 to further identify sage grouse wintering areas. These surveys should be conducted on the ground, and all data collected should be provided on General Wildlife Observation Data Sheets or other suitable forms (see Appendix B). Operators will cooperate in any further ongoing sage grouse studies within the WSA and with the WGFD on any existing and new sage grouse habitat improvement efforts (e.g., water developments) within Upland Game Bird Management Area 7.

Removal of water development structures proximal to lek 4 (Clay Hill) may occur in 2001, as directed by BLM. Removal of these facilities may eliminate potential raptor perch sites and/or reduce the use of this area by livestock and humans.

Operators will utilize directional drilling to access resources beneath the 0.25-mi active sage grouse lek buffers (see Appendix A, Wildlife Map) and beneath the 600-ft wide (or tall sagebrush-dominated) buffer associated with Sand Draw, Granite Wash, and Alkali Draw protection areas if reserves beneath these locations are deemed economically feasible.

3.3 THREATENED, ENDANGERED, PROPOSED, CANDIDATE, AND WYOMING SPECIES OF CONCERN

3.3.1 Results

3.3.1.1 Black-footed Ferret

No black-footed ferrets or black-footed ferret sign was observed on the J2PA during the black-footed ferret survey conducted on the area during 1999. Survey results are presented in McMurry (1999), which is available for review at the BLM Pinedale Field Office.

No PDTs with burrow densities suitable as black-footed ferret habitat (i.e., >8 burrows/ acre) were identified in the MJ2PA during year 2000 (Table 3.9). However, portions of PDTs 8, 16, 17, and 18 in the southeastern portion of the WSA have prairie dog burrow densities suitable for black-footed ferret (see Appendix A, Habitat Map), and black-footed ferret surveys may be required if developments are proposed within these towns.

3.3.1.2 Bald Eagle, Ferruginous Hawk, Golden Eagle

No bald eagles were observed on the WSA during 1999 and 2000 wildlife investigations. Information on ferruginous hawks and golden eagles is provided in Section 3.1.1.

3.3.1.3 Mountain Plover

Mountain plover were observed for the first time adjacent to the J2PA during 1999 and a single plover was observed within the J2PA during 2000 (see Appendix B). Adults with at least two young were recorded on separate occasions outside the J2PA during 1999, indicating the presence of mountain plover breeding in the Alkali Creek drainage

Table 3.9 Whitetail Prairie Dog Towns, Jonah II Wildlife Study Area, 2000.

Prairie Dog Town[1]	Acreage[2]	Number of Open Burrows[2, 3]	Burrow Density (burrows/acre)[2, 5]
1	400	326	0.8
2	423	458	1.1
3	825	39	<0.1
4	903	NS	UNK
5	106	NS	UNK
6	358	724	2.0
7	800	NS	UNK
8	1,246 (131)	208[4] (103)	4.5 (14.2)
9	280	NS	UNK
10	39	NS	UNK
11	203	NS	UNK
12	79	NS	UNK
13	86	NS	UNK
14	105	NS	UNK
15	189	NS	UNK
16	203 (52)	(35)[4]	6.9 (13.8)
17	141 (30)	36[4] (26)	6.5 (15.6)
18	357 (55)	54[4] (43)	4.1 (16.6)
19	10	NS	UNK
20	9	NS	UNK

[1] See Appendix A, Habitat Map, for location.
[2] Numbers in parentheses are for high density areas (Schlumberger Geco-Prackla 2000).
[3] NS = not surveyed.
[4] Sample only.
[5] UNK = unknown.

(Appendix B). No mountain plover were observed during species-specific investigations on and within 0.5 mi of the MJ2PA during 2000 (see Appendix E).

3.3.1.4 Western Burrowing Owl

Six western burrowing owl nests/nest sites were observed on the WSA from 1997 to 2000 (see Tables 3.1 and 3.2 and Appendix C, Raptor Nesting Records). Of these nests, only two are known to have produced young; however, burrowing owl nests 75 and 76 were not monitored for productivity during 1998 and 1999, and these nests may have successfully produced young in these years.

3.3.1.5 Other TEPC&WSC Species

The only other known TEPC&WSC noted on the WSA during 1999 and 2000 surveys and on-site investigations conducted during APD and ROW reviews was the loggerhead shrike, and it is possible that the species bred in the area during these years.

3.3.2 Monitoring and Protection

USFWS and/or WGFD consultation and coordination will be conducted for all necessary mitigation activities relating to TEPC&WSC and their habitats implemented during 2001.

3.3.2.1 Black-footed Ferret

All whitetail PDTs within the J2PA have been mapped, and those within the MJ2PA were remapped and censused for open burrows in 2000 to determine whether they meet the black-footed ferret habitat criteria established in the USFWS (1989) guidelines. Proposed disturbance in PDTs 1, 2, 3, and 6 will not adversely affect black-footed ferrets since these towns are not suitable as black-footed ferret habitat.

During 2001, PDTs 1, 2, 3, and 6 will be reinvestigated to locate and map the areas within these towns that have the highest burrow densities. GPS will be used to map these areas. Burrow densities will be censused within the areas of highest burrow density.

If PDTs/portions of PDTs of sufficient size and burrow density for black-footed ferret habitat are scheduled to be disturbed, black-footed ferret surveys of these towns/town portions will be conducted. Survey protocol will adhere to USFWS guidelines as established in USFWS (1989). Surveys will be conducted by a USFWS-qualified biologist no more than 1 year prior to proposed disturbance, and reports identifying survey methods and results will be prepared and submitted to the USFWS and BLM in accordance with Section 7 of the *Endangered Species Act of 1973*, as amended, and Interagency Cooperation Regulations. Surveys will be financed by the Operators.

If black-footed ferrets are found within the J2PA but outside the MJ2PA, the USFWS will be notified immediately and formal consultations will be initiated to develop strategies that ensure no adverse effects to the species. If black-footed ferrets are found within the MJ2PA, the USFWS will be notified immediately, and no further disturbance would occur to the prairie dog complex in which the black-footed ferret was observed. Before ground-disturbing activities are initiated in black-footed ferret habitat, authorizations to proceed would be required from the BLM, in consultation with the USFWS.

3.3.2.2 Bald Eagle, Ferruginous Hawk, Golden Eagle

Monitoring and protection protocol for bald eagle, ferruginous hawk, and golden eagle in 2001 will be as described for raptors (see Section 3.1.2). Additional measures will be applied on a species- or site-specific basis, as deemed necessary by the USFWS and/or BLM, if potential impacts to these species are identified during 2001 APD and ROW application reviews.

3.3.2.3 Mountain Plover

The following protocol has been modified from that presented in BLM (1998a, Appendix E) to accommodate USFWS changes to mountain plover survey and avoidance protocol. The protocol remains consistent with that presented in BLM (2000b).

During the period of May 1-June 15, 2001, mountain plover surveys will be conducted by an Operator-financed, BLM-approved biologist in accordance with USFWS guidelines (USFWS 1999) on suitable breeding areas throughout the MJ2PA and a 0.5-mi buffer (see Appendix A, Habitat Map). Survey procedures will be as follows:

- surveys will be conducted during early courtship and territory establishment;
- surveys will be conducted from sunrise to 10:00 a.m. and/or from 5:30 p.m. to sunset;
- surveys will be conducted from four-wheel-drive vehicles or, where access is a problem and/or no visual observations are made from vehicles, ATVs will be used;
- surveyors will remain in or close to vehicles when scanning with binoculars;
- after 2001, surveys for mountain plover will be conducted in appropriate habitat within 200 m (656 ft) of proposed disturbance sites;
- sites will be surveyed three times during the survey window (May 1-June 15), with each survey separated by at least 14 days;
- surveys will not be conducted in inclement weather (e.g., poor visibility);
- surveys will focus on locating displaying or calling males;
- if breeding birds are observed, additional surveys will be implemented immediately prior to construction to search for active nest sites (applicable to only post-2001 surveys);
- if an active nest is located, a 656-ft buffer zone will be established around the nest to prevent direct and indirect nest disturbance; and
- surface-disturbing activities will occur as near to completion of surveys as possible.

Mountain plover surveys will not be conducted for construction activities planned for the period of July 11 through April 9. Survey results will be compared with the annual development plans to determine if any proposed surface-disturbing activities will affect occupied mountain plover nesting habitat. Where practicable, development plans will be modified to avoid nesting habitat (e.g., through road realignment).

If an active nest is found in the survey area, planned activities will be delayed 37 days, or 1 week post-hatching, or if a brood of flightless chicks is observed, activities will be delayed at least 7 days.

Where access roads and/or well locations have been constructed prior to the mountain plover nesting season (April 10-July 10) and use of these areas has not been initiated for development actions prior to April 10, a BLM-approved biologist will conduct site investigations of these disturbed areas prior to use to determine whether mountain plover are present. In the event plover nesting is occurring, Operators will delay development activities until nesting is complete.

Nest success and productivity of all mountain plover nests found within the MJ2PA will be monitored and reported to the BLM and USFWS Wyoming Field Office annually.

Prior to implementing surface disturbance within 200 m (656 ft) of known mountain plover concentration areas (i.e., areas where broods and/or adults have been observed in the current year or documented in at least 2 of the last 3 years), Operators will consult with the BLM regarding initiation of informal conferencing with the USFWS.

If removal of mountain plover nesting habitat is unavoidable, loss will be minimized by creating additional nesting habitat; it is assumed that many of the existing and proposed pipeline reclamation areas on the MJ2PA would provide suitable plover breeding habitats. Areas of pipeline reclamation that provide suitable plover breeding areas will be identified annually. If nesting habitat is disturbed, the area will be reclaimed to approximate original

conditions (topography, vegetation, hydrology, etc.) after completion of activities, such that disturbed potential mountain plover breeding habitat is reclaimed to conditions suitable for mountain plover breeding.

Operators will minimize road construction and maintenance activities (i.e., grading) in suitable plover habitat from April 10- July 10. No surface-disturbing activities will be conducted from April 1 - June 30 within 656 ft of identified mountain plover concentration areas (i.e., areas where broods and/or adults have been observed in the current year or documented in at least 2 of the past 3 years).

3.3.2.4 Western Burrowing Owl

Monitoring and avoidance of prairie dog colonies (see Section 3.3.2.1) and avoidance of active raptor nests during the nesting period (see Section 3.1.2) will continue in 2001. Additionally, productivity monitoring will be implemented for all active burrowing owl nests on the MJ2PA and a surrounding 0.5-mi area. Additional measures may be applied in future years if burrowing owl nesting and/or productivity in the WSA is noted to be declining. These potential measures will be identified by the BLM.

3.3.2.5 Other TEPC&WSC Species

No formal surveys for other TEPC&WSC are proposed for 2001; however, since loggerhead shrike have been seen in the area, special attention to this species is recommended for APD and ROW application field reviews. If, during implementation of surveys for other species or during APD and ROW application field reviews, any TEPC&WSC is observed on areas within 0.5 mi of proposed disturbance sites, nests or other crucial features for the observed species, if any, will be avoided. Consultation and coordination with the BLM, USFWS, and WGFD will also be conducted, as necessary. Construction activities in these areas will be curtailed until there is concurrence among Operators, BLM, USFWS, and WGFD on what

activities can be authorized. Activities will, in most cases, be delayed until such time that no adverse effects would occur (e.g., after fledging).

No additional protection measures will be applied for other sensitive species potentially present on the WSA; however, it is assumed that the protection protocol specified below for general wildlife will benefit TEPC&WSC as well (see Section 3.3.3.2). In addition, if TEPC&WSC are observed, efforts will be made to determine the activities of the species on the WSA (e.g., breeding, nesting, foraging, hunting). If any management agency (i.e., BLM, WGFD, USFWS) identifies a potential for impacts to any TEPC&WSC species, additional monitoring and/or protection measures will be implemented as directed by the BLM.

3.3.3 General Wildlife

3.3.3.1 Results

Data on other wildlife species observed on the WSA during 1999 and 2000 surveys are provided in Appendix B and in APD and ROW application field review data available at the BLM Pinedale Field Office.

3.3.3.2 Monitoring and Protection

No formal wildlife monitoring for other wildlife is recommended for 2001.

Protection measures primarily designed to minimize impacts to other area resources (e.g., vegetation and surface water resources including wetlands, steep slopes) are identified in BLM (1998a, 2000b), and these measures provide additional impact mitigation for area wildlife. Well locations, access roads, pipelines, and ancillary facilities will be selected and designed to minimize disturbances to areas of high wildlife habitat value, including wetlands and riparian areas. Areas with high erosion potential and/or rugged topography (i.e., steep slopes, dunes, floodplains, unstable soils) will be avoided, where practical.

Removal or disturbance of vegetation will be minimized through construction site management (e.g., by utilizing previously disturbed areas, using existing ROWs, designating limited equipment/materials storage yards and staging areas, scalping), and Operators will adhere to all reclamation guidelines presented in the Reclamation Plan for this project (see Appendix B in BLM 1997, 1998a, and 1998b).

To minimize wildlife mortality due to vehicle collisions, Operators will continue to advise project personnel regarding appropriate speed limits (i.e., 35 mph) in the project area, and roads will be reclaimed as soon as possible after they are no longer required. Some existing roads in the area may be closed and reclaimed by Operators as authorized by the BLM. No roads are currently proposed for reclamation.

To protect plant populations and wildlife habitat, project-related travel will be restricted to established project roads; no off-road travel will be allowed, except in emergencies.

No road or pipeline ROW fencing is proposed; however, if ROW fencing is required, it will be kept to a minimum and the fences employed will consist of four-strand barbed wire which meets BLM and WGFD approval for facilitating wildlife movement. Wildlife-proof fencing will be utilized only to enclose reclaimed areas where it is determined that wildlife species are impeding successful vegetation establishment. No improvements to existing fences on the area are currently proposed.

No new wildlife/livestock water sources are currently proposed for development.

Potential increases in poaching will be minimized through continued employee and contractor education regarding wildlife laws, and Operators will notify all employees (contract and company) that conviction of a major game violation could result in disciplinary action. If violations are discovered, Operators will immediately notify the BLM and WGFD, and if the violation involves an employee or contractor, said employee or contractor will be disciplined and may be dismissed by the Operator and/or prosecuted by the WGFD.

Additional nonspecies-specific wildlife mitigations include the following.

- Reserve, workover, evaporation, and flare pits potentially hazardous to wildlife will be adequately protected by netting and/or fencing as directed by the BLM to prevent access by migratory birds and other wildlife.

- Siphons will be constructed at each reserve pit to collect, as necessary, any undesirable materials that may enter the pits.

- Potential impacts to fisheries will be minimized by using proper erosion control techniques (e.g., water bars, jute netting, rip-rap, mulch). Construction within 500 ft of open water and 100 ft of intermittent or ephemeral channels will be avoided, where possible. Channel crossings for roads and pipelines will be constructed when flows are not expected (i.e., late summer or fall). All necessary crossings will be constructed perpendicular to flow. No surface water or shallow groundwater in connection with surface water will be utilized for the proposed project.

- Firearms and dogs will not be allowed on the J2PA during working hours by BLM or Operator employees or their contractors. Operators will enforce existing drug, alcohol, and firearms policies.

- If injured wildlife are observed on the J2PA, Operator personnel will contact the BLM Pinedale Field Office and the WGFD Pinedale Office. Under no circumstances will injured wildlife be approached or handled.

- Wildlife reporting as specified in the ROD (BLM 1998, Appendix E) will be continued in 2001.

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