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Attachment 2. Peregrine Falcon and Black-Footed Ferret Monitoring Plan for the Black Mesa and Kayenta Mines

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Attachment 4. Biological Report: Wildlife and Habitat Reconnaissance of Proposed Life of Mine Coal Resource Areas, PWCC Leasehold, Black Mesa, Arizona

at increased levels of intensity because of the nature of the wildlife group involved. Qualitative studies were conducted in the mixed conifer woodland habitat to the north of the leasehold. A detailed census of waterfowl and shorebirds, started in 1982 by Peabody biologists, was completed in 1983. The results of this study were reported in the Vegetation and Wildlife Resources 1983 Report for the Black Mesa and Kayenta Mines (Arizona Division, PCC 1984). Raptor nesting surveys were started in 1982 and are ongoing annually. The monitoring data collected to 1984 were presented along with the results of other monitoring activities in the Vegetation and Wildlife Resources 1984 Report (Arizona Division, PCC 1985). Since 1984 wildlife monitoring results have been reported to OSMRE on an annual basis. Additionally, wildlife studies were conducted in the remaining PWCC leasehold life of mine coal resource areas (LOMCRA) in 2003. These studies can be found in Attachments 4 and the studies in Attachment 4 include the N99 and N12 areas in an earlier revision to this chapter.

The objective of this chapter is to provide a detailed descriptions of the fish and wildlife and their habitats within and surrounding the Black Mesa leasehold. This necessitated consolidation of information that had been collected over a period of six years. See Attachment 1 for a subject reference listing of this information.

The following sections present: (1) a review of the fish and wildlife sampling methods; (2) a description of the fish and wildlife resources and their habitats; (3) a discussion of wildlife groups of special interest; (4) a discussion of critical habitats; (5) impact analysis; and (6) procedures for minimizing or reducing impacts.

## Methods and Materials

Qualitative and quantitative surveys of amphibians, reptiles, birds and mammals have been conducted in and surrounding the leasehold since 1979, involving a number of consultants and investigators. Sampling was conducted in each habitat identified on the leasehold. The level of sampling intensity was based upon the degree of impact expected in each habitat. For example, the sagebrush shrubland and pinyon-juniper habitats received concentrated efforts because they are the primary habitats impacted. Sampling methods are presented below for each wildlife group.

Reptiles and Amphibians. Quantitative sampling of these vertebrate classes was conducted by EH&A biologists using pit-traps, general field reconnaissance and observation, and listening for vocalizations at appropriate times (EH&A 1980). Paired pit-fall traps were established for four to six days in each habitat type. All additional information on

these groups was collected as observational records kept during field activities conducted by Peabody biologists since the spring of 1982.

Birds. Avian species were sampled using daily and seasonal field observation, variable width transects (Emlen 1971, 1977), spot-map censuses (Kendeigh 1944) and road cruise counts of relative frequency (EH&A 1980).

The total number of each avian species observed and the mileage traveled was recorded daily as on-site surveys were conducted by EH&A in 1979 and 1980. Results were expressed as the total number of each species observed and the number of each species observed per distance traveled, seasonally. Incidental bird observation records have been kept by Peabody biologists since 1982. Notes are kept in a manner which provides insight into the timing and dynamics of migration, breeding activities, habitat preferences, foraging behavior and response to mining activities.

Twice each season, a road cruise census was made over a route encompassing all habitat types represented in the particular area being surveyed. The length of the route was determined by the size of the sample area. Three-minute stops to record bird detections were made at 0.8 kilometer intervals. Results were expressed as the percent of station stops at which each species was observed (frequency) and number of birds observed per mile along the route (abundance). Three routes were established to perform the cruise censuses (Figure 2). EH&A biologists drove a 32.18 kilometer route throughout the western and northeastern portion of the leasehold. Peabody biologists drove a 16.1 kilometer route in the area around the J-16 and J-28 mining areas and throughout the contiguous J-19, 20, 21 and 23 mining areas.

Seasonal variable strip censuses were conducted in the principal habitat types in the survey areas to determine bird densities. The transects were 1,500 meters in length and were traversed three times each season. Habitats which have been censused include the sagebrush shrubland, saltbush shrubland, sagebrush-mixed shrub (rabbitbrush) shrubland, tamarix riparian strand, greasewood shrubland, pinyon-juniper woodland and sagebrush/pinyon-juniper transition (Figure 2). Results are expressed as numbers per 40 hectares.

Spot-map censuses of three stands of pinyon-juniper woodland in the vicinity of the contiguous J-19 through 23 mining areas were conducted in 1983 and 1984 (Figure 2).

ATTACHMENT 4

BIOLOGICAL REPORT: WILDLIFE AND HABITAT RECONNAISANCE
OF PROPOSED LIFE OF MINE COAL RESOURCE AREAS,
PWCC Leasehold, BLACK MESA ARIZONA

*BIOLOGICAL REPORT:*

# Wildlife and Habitat Reconnaissance of Coal Resource Areas, PWCC Leasehold, Black Mesa, Arizona

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Submitted To:

PEABODY WESTERN COAL COMPANY

P.O. Box 650
Kayenta, Arizona 86033
928.677.3201

Submitted By:

BIOME, ECOLOGICAL AND WILDLIFE RESEARCH

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4 November 2003

*BIOLOGICAL REPORT:*

# Wildlife and Habitat Reconnaissance of Coal Resource Areas, PWCC Leasehold, Black Mesa, Arizona

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## Abstract

In 2003, PWCC evaluated baseline wildlife conditions for coal resource areas on the PWCC leasehold for . This report details the TES, other wildlife resources, and wildlife habitats found on the lease area in and surrounding the Coal Resource Areas (LOMCRAs). The areas that were surveyed as part of this biological survey included the J2/J15, J4, J5/J6/J13/J14, J8, J9/J10, N9, N10, N99 North, and N12/N99 South LOMCRAs. Wildlife species are similar across all LOMCRAs, with large ungulate sign more frequently observed on the northern LOMCRAs. A total of 7 mammalian species, 23 avian species, and 5 herpetile species were identified on the LOMCRAs. A total of 16 listed species were identified by the Navajo Natural Heritage Program (NNHP) as occurring or potentially occurring on or near the LOMCRAs. Surface disturbance activities may affect habitat for the Navajo Mountain Mexican vole. Surface disturbance activities may also affect suitable breeding habitat for five other species listed by the NNHP. However, the potential for these five species to occur on these LOMCRAs is slim. There are no records for the black-footed ferret, the mountain plover, the kit fox or the Townsend's big-eared bat and all but one of these species (the Townsend's big-eared bat) are unlikely to occur on the mine leasehold. Navajo Mountain Mexican vole habitat is present in the N10, N99 North, and the J2/15 LOMCRAs. The total acreage of suitable habitat for this species in each of these LOMCRAs is 40.8, 27.8, and 1.6 acres respectively for a total of 70.2 acres affected in the LOMCR study areas. Raptor surveys for breeding northern goshawks were conducted in the N99 North and N10 areas. No northern goshawks were documented during surveys.

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ATTACHMENT B:
Photos 1-4. LOMCRA Study Area Photos

# Introduction

Peabody Western Coal Company (PWCC) contracted BIOME, Ecological and Wildlife Research (BIOME) to conduct wildlife studies in certain coal resource areas on the PWCC Leasehold. These studies consisted of general wildlife, threatened, endangered, and sensitive (TES) species inventory and monitoring for the purpose of augmenting the original baseline studies conducted in and surrounding the PWCC Leasehold. The results of these studies, in conjunction with the results of the original baseline work, fulfill wildlife baseline studies for the PWCC Leasehold and Kayenta Complex.

This report details the TES, other wildlife resources, and wildlife habitats found on the Coal Resource Areas (LOMCRAs). The original baseline wildlife studies of the PWCC Leasehold, conducted in three phases from 1979 through 1983, were completed in order to qualitatively and quantitatively describe the wildlife and wildlife habitats in and immediately surrounding the entire PWCC Leasehold. The results of these studies were presented in Chapters 9 and 10 of the Permit Application Package (PAP, PWCC 1985) for the Kayenta Mine.

The 2003 studies used the latest tribal, state, and federal lists of TES species to determine which species have the potential to occur on the PWCC Leasehold. The work was conducted seasonally, focusing on the spring and fall migration periods for avian species, in order to obtain representative results. The remainder of this report details the results of surveys conducted during the 2003 field season and a summary of the knowledge currently known about the LOMCRAs.

Data was collected for this report by general reconnaissance surveys for TES species habitats, spring and fall avian surveys, and delineation of potential TES species habitat within each LOMCRA. Such wildlife monitoring activities will serve to address potential direct impacts to wildlife, TES species, and potential habitat for TES species, resulting from continuation of mine activities.

To determine the potential impacts to TES and wildlife species on the LOMCRAs, BIOME conducted the following activities during the 2003 field season:

1) A general reconnaissance for TES species and potential TES species habitats in each of the LOMCRAs,
2) Spring and fall general avian surveys,
3) A delineation of suitable habitat for TES species within each LOMCRA, and
4) A historic data search of wildlife known, or with potential to occur, within or near these areas,
5) Raptor surveys, focusing on presence of northern goshawk, in selected LOMCRAs.

## Proposed LOMCRAs

The PWCC Leasehold lies on the north-central portion of the Black Mesa monocline and the habitats represented on the leasehold are entirely Great Basin cold desert woodlands, particularly pinyon-juniper woodland (Brown 1994), and cold desert habitats, particularly sagebrush shrubland. In 2003 there were five active mining areas on the 65,000-acre mine leasehold. To complete wildlife baseline activities on the leasehold, 9 additional LOMCRAs were surveyed to determine the potential for TES species or suitable habitat to occur on them. The areas that were surveyed as part of this biological survey included the J2/J15, J4, J5/J6/J13/J14, J8, J9/J10, N9, N10, N99 North, and N12/N99 South LOMCRAs (Attachment B, Drawing 1).

Each LOMCRA varies with regards to the quantity of woodland canopy coverage, age of woodland present, density and coverage of woody shrub cover, and soils present. Important habitats found on the LOMCRAs include contiguous sagebrush flats, mid to late-seral pinyon-juniper woodland, ephemeral drainages, and sandstone bluffs. Contiguous sagebrush shrubland has been identified as important habitat for a Group 4 (NESL) species, the Navajo Mountain Vole (*Microtus mexicanus navaho*). Mid to late seral woodlands represent potentially suitable breeding habitat for forest raptors including Cooper's hawks (*Accipiter cooperi*) and northern goshawks (*Accipiter gentilis*). Ephemeral drainages, including Coal Mine Wash, Moenkopi Wash, and Yellow Water Wash support thin strands of salt cedar (*Tamarisk ramossissima*) in some areas and provide habitat for migrant songbirds and rodents (including the Navajo Mountain Mexican vole). Sandstone bluffs provide preferred breeding habitats for red-tailed hawks (*Buteo jamaicensis*).

Elevation of the LOMCRAs ranges from 6,100 feet in elevation on the southern end of the leasehold (i.e. area J8) to approximately 6,900 feet at the northern end of the leasehold (i.e. area N10). Numerous large drainages dissect the proposed LOMCRAs, but habitat within these features will have minimal impacts from mine-related activities. Soils on the LOMCRAs vary from shallow to moderate depth and are predominantly composed of sandstone and shale derivatives.

# Methods

## Field Reconnaissance

A field reconnaissance of each LOMCRA was conducted to identify important habitats, determine the need for species-specific surveys, and produce a species list of vertebrates on each LOMCRA. Pedestrian transects, vantage point observations, and directed reconnaissance of important habitats was used to determine the suitability of each LOMCRA for TES species. During the reconnaissance of each extension area a list of all avian, mammalian, and herpetile species, identified directly or indirectly (scat, tracks, etc.), were recorded. Field maps were used to delineate potentially suitable habitat for TES species and to record the locations of individual species of interest. Photos were taken of habitats within LOMCRAs and of representative LOMCRAs. GPS coordinates were taken at locations where TES species were suspected or observed. Data for TES species have been included on the final map (Attachment A, Map 1).

## Historic Data Search

The original baseline wildlife studies of the PWCC Leasehold, conducted between 1979 and 1983, identified the important habitats on, and within the two-mile buffer area, of the PWCC Leasehold. The results of these studies were presented in the PAP for the Kayenta Mine (PWCC 1985). Using these reported data collected by PWCC in past years, we identified records of TES species on or near proposed LOMCRAs. This information was used to identify important habitats on LOMCRAs, and to focus reconnaissance efforts during the field surveys.

## Raptor Surveys on Selected LOMCRAs

Species-specific surveys for northern goshawks and other raptors were conducted during the 2003 field season in LOMCRAs N99 North and N10 (Attachment A, Map 2). Survey methods followed those described by Joy et al. (1994). Two field surveys were conducted, the first survey during the last week of May and the second survey during second week of July. Areas around proposed borehole/corehole locations were checked for the presence of stick nests in potentially suitable trees. Calling stations were set approximately 970 feet apart within suitable habitat to attain complete coverage of the survey area. A battery amplified power horn was used to broadcast northern goshawk alarm calls for 2 minutes at each calling station followed by a 2-minute listening period. This process was repeated to provide a total of 8 minutes of calling/listening time per calling station. All raptor species, whether responsive to call or incidentally observed, were documented at and between calling stations.

## NESL Species Assessments

A list of threatened, endangered, and sensitive (TES) species potentially occurring on the PWCC Leasehold was derived using the March 2001 Navajo Endangered Species List (NESL) published by the Navajo Natural Heritage Program (NNHP). Species were included on the list based on habitats present on the PWCC Leasehold, documented records of listed species from historical biological surveys, and personal knowledge of the fauna of the region.

# Results

## LOMCRAs

The proposed LOMCRAs encompass 15,019 acres of the approximately 65,000-acre leasehold. Individual acreages of each LOMCRA are provided in Table 1. Not all LOMCRAs listed in Table 1 were surveyed as part of this project. Those LOMCRAs with previous data were excluded.

**Table 1. LOMCRAs on the PWCC Leasehold.**

| LOMCRA |
|---|
| J2/J15 |
| J4 |
| J8 |
| J9*/10 |
| N9 |
| N10 |
| N12/N99 South |
| N99 North |
| J5/6/13/14 |

*Area previously surveyed (see SWCA 2000).

Each LOMCRA varied in the amount of woodland coverage, drainages, shrubland, and open habitats present. The most northern LOMCRAs (N9, N10, and N99) have mid to late seral pinyon-juniper woodland that is well developed in some areas (Attachment B, Photo 1). Tree species include pinyon pine (*Pinus edulis*), Gambel oak (*Quercus gambelii*), and Utah juniper (*Juniperus osteosperma)*. Utah juniper dominates many of the lower, drier woodland areas, but denser pinyon-dominated stands occur at higher elevations or areas with more mesic site conditions. Gambel oak also becomes a common inclusion in these areas. This habitat is typified by a canopy height of less than 30 feet with some mid-story shrub or tree component. Ground cover varies, but is dominated by woody perennial plant species including big sagebrush (*Artemesia tridentata*), cliffrose (*Cowania mexicana*), and four-wing saltbush (*Atriplex canescens*). Herbaceous composition can be diverse, but overall cover is sparse.

The southern LOMCRAs (J2/15, J5/6/13/14, J4, and J8/9/10) are all characteristically low in woodland coverage and although pinyon-juniper woodland is present in all of these areas, the density of trees, usually represented by Utah juniper, is low (Attachment B, Photo 2). Canopy height over most of these areas is less than four feet and is dominated by woody shrubs, mostly big sagebrush. Other shrub species on the southern LOMCRAs include cliffrose, snakeweed (*Gutierrizia sarothrae*), black greasewood (*Sarcobatus vermiculatus*), and four-wing saltbush. Herbaceous species coverage is somewhat greater in these shrubland types and include blue grama (*Bouteloua gracilis*), Indian ricegrass (*Oryzopsis hymenoides*), galleta (*Hilaria jamesii*) and globemallow (*Sphaeralcea* sp.). Detailed vegetation studies are presented in the PAP, Chapter 9, Vegetation Resources.

Wildlife species are similar across all LOMCRAs, with large ungulate sign more frequently observed on the northern LOMCRAs. This however was not numerically quantified. Observations of ungulates included four mule deer in N99 North, six mule deer at the north end of the N10 LOMCRA, and numerous sign of mule deer and elk (pellet groups) within N9 North,

N10, N99 North, N12/N99 South, and J2/15. Other observed wildlife included several mammal species, numerous avian representatives, and typical Great Basin herpetofauna. A list of vertebrate species observed during the field reconnaissance is presented in Table 2.

**Table 2. Vertebrate species observed during LOMCRA field reconnaissance.**

| | *Scientific Name* | Common Name |
|---|---|---|
| **Mammals** | *Canis latrans* | Coyote |
| | *Cervus elaphus* | Rocky Mountain elk |
| | *Lepus californicus* | Black-tailed jackrabbit |
| | *Neotoma* sp. | Woodrat |
| | *Odocoileus hemionus* | Mule deer |
| | *Spermophilus variegatus* | Rock squirrel |
| | *Sylvilagus audubonii* | Desert cottontail |
| **Birds** | *Amphispiza belli* | Sage sparrow |
| | *Aphelocoma californica* | Western scrub-jay |
| | *Baeolophus ridgwayi* | Juniper titmouse |
| | *Buteo jamaicensis* | Red-tailed hawk |
| | *Carpodacus mexicanus* | House finch |
| | *Cathartes aura* | Turkey vulture |
| | *Chondestes grammacus* | Vesper sparrow |
| | *Corvus corax* | Common raven |
| | *Dendroica nigrescens* | Black-throated gray warbler |
| | *Empidonax wrightii* | Gray flycatcher |
| | *Falco sparverius* | American kestrel |
| | *Gymnorhinus cyanocephalus* | Pinyon jay |
| | *Myiarchus cinerascens* | Ash-throated flycatcher |
| | *Pipilo maculatus* | Spotted towhee |
| | *Poecile gambelli* | Mountain chickadee |
| | *Polioptila caerulea* | Blue-gray gnatcatcher |
| | *Psaltriparius minimus* | Bushtit |
| | *Sayornis saya* | Say's phoebe |
| | *Sialia currucoides* | Mountain bluebird |
| | *Sialia mexicana* | Western blue bird |
| | *Sitta carolina* | White-breasted nuthatch |
| | *Spizella passerina* | Chipping sparrow |
| | *Tachycineta thalassina* | Violet-green swallow |
| | *Thryomanes bewickii* | Bewick's wren |
| **Herpetiles** | *Cnemidophorus* sp. | Whiptail lizard |
| | *Crotophytus collaris* | Collared lizard |
| | *Sceloporus graciosus* | Sagebrush lizard |
| | *Sceloporus undulatus* | Fence lizard |
| | *Uta stansburiana* | Side-blotched lizard |

## Raptor Surveys on Selected LOMCRAs

A total of 14 calling stations were visited in the N10 LOMCRA and 30 stations were visited in the N99 North LOMCRA (Attachment A, Map 2). One historic red-tailed hawk (*Buteo jamaicensis)* nesting location in the N99 North LOMCRA was visited during each survey period to determine the status of the nest. This nest remained inactive during the entire 2003 field season and little remains of the original nest.

N99 North LOMCRA Survey

A single American kestrel (*Falco sparverius*) was observed on two occasions (6 May and 16 July). This individual was a male and was observed in approximately the same location during both survey periods; it is likely that the same individual was observed on both occasions. Other avian species observed during surveys included pinyon jays, Bewick's wren, Juniper titmouse,

rock wren, house finch, gray flycatcher, Blue-gray gnatcatcher, Black-throated gray warbler, plumbeous vireo, dark-eyed junco, bushtit, ruby-crowned kinglet, ash-throated flycatcher, hairy woodpecker, and common raven. Several pair of pinyon jays were observed actively building nests in the southeastern portion of the N99 North area, closest to the N14-D pond.

N10 LOMCRA Survey

On the morning of the first survey, a male Cooper's hawk was observed on the ridge to the east of Yellow Water Canyon, approximately 1.5 miles north of the N10 LOMCRA. This bird was soaring and displaying hackles, suggesting the bird may have been in the early stages of breeding. A male American kestrel was observed on 30 April in the western portion of the N10 LOMCRA. This bird did not respond to calling, but flew north into Yellow Water Canyon. The same individual (assumed) was seen in the vicinity of the first location later in the season, but was not identified during the second survey period. A single red-tailed hawk was observed in a small canyon on the north-central portion of the N10 LOMCRA. This bird was soaring and flew north out of the LOMCRA and no additional observations of this species were recorded in this location during the field season. Other avian species observed during surveys of the N10 LOMCRA included pinyon jay, white-breasted nuthatch, gray flycatcher, green-tailed towhee, scrub jay (carrying food), Bewick's wren, violet-green swallow, juniper titmouse, and Cassin's kingbird. Both the pinyon jays and the Cassin's kingbird responded to the broadcast surveys.

## Threatened, Endangered, and Sensitive Species

A total of 16 listed or candidate species were identified by the NNHP as occurring, or potentially occurring, on or near the LOMCRAs (Table 3). In addition to listed species, migratory birds and non-endangered raptors and bald eagle may occur on or near the LOMCRAs. Migratory birds and non-endangered raptors are treated in the section above.

**Table 3. Species with potential to occur on or near the LOMCRAs.**

| Scientific Name | Common Name | NESL Status* | Federal Status |
|---|---|---|---|
| *Empidonax trailii extimus* | Southwestern willow flycatcher | Group 2 | E, MBTA |
| *Mustela nigripes* | Black-footed ferret | Group 2 | E |
| *Rana pipiens* | Northern leopard frog | Group 2 | none |
| *Aquila chrysaetos* | Golden eagle | Group 3 | EPA, MBTA |
| *Buteo regalis* | Ferruginous hawk | Group 3 | MBTA |
| *Strix occidentalis lucida* | Mexican spotted owl | Group 3 | T |
| *Accipiter gentilis* | Northern goshawk | Group 4 | MBTA |
| *Aegolius acadicus* | Northern saw-whet owl | Group 4 | MBTA |
| *Charadrius montanus* | Mountain plover | Group 4 | T, MBTA |
| *Falco peregrinus* | Peregrine falcon | Group 4 | MBTA |
| *Glaucidium gnoma* | Northern pygmy owl | Group 4 | MBTA |
| *Microtus mexicanus navaho* | Navajo Mountain vole | Group 4 | none |
| *Otus flammeolus* | Flammulated owl | Group 4 | MBTA |
| *Plecotus townsendii* | Townsend's big-eared bat | Group 4 | none |
| *Vulpes macrotis* | Kit fox | Group 4 | none |
| *Haliaeetus leucocephalus* | Bald eagle | none (ETL) | EPA, MBTA |

** NESL March 2001 List*

**Status Definitions**

**Navajo Endangered Species List Status Codes and Definitions**

**G1**- Group 1: Extirpated - Species no longer occurs on the Navajo Nation.

**G2**- Group 2: Endangered - Any species or subspecies in danger of being eliminated from all or a significant portion of its range on the Navajo Nation.

**G3**- Group 3: Threatened - Any species or subspecies which is likely to become endangered within the foreseeable future, throughout all or a significant portion of its range on the Navajo Nation.

**G4**- Group 4: Candidate - Any species or subspecies for which the NFWD does not currently have sufficient information to support their listing as G2 or G3 but has reason to consider them. The NFWD is actively seeking information to determine if they warrant inclusion in a different group or removal from the list. They are not protected under Tribal Code but should be considered in project planning.

**ETL** – A species for which element occurrence records are requested, but have no listing status on the NESL.

**Federal Status Codes and Definitions**

**LE** - Listed Endangered by the USFWS under the Endangered Species Act (ESA).

**LT** - Listed Threatened by the USFWS under the ESA.

**C** -Candidate as listed by the USFWS under the ESA. Species determined to be appropriate for listing, but are currently precluded due to other listing priorities.

**MBTA** – Birds federally protected under the Migratory Bird Treaty Act (16 USC § 703 et seq).

**EPA** – Bald and Golden Eagle Protection Act of 1940 (16 USC § 668a-668d)

Species that have no potentially suitable habitat on the LOMCRAs were not included on this list of TES species. Such species included all fish species, riparian obligates, species with particularly narrow geographic distributions, and species with specific habitats not found on or near the LOMCRAs. Fish species and riparian obligates (i.e. western yellow-billed cuckoo) were not considered as there are no such habitats on the LOMCRAs. The following section provides a brief summary of each listed species considered by this biological report. The species status, habitat requirements, and potential to occur on the LOMCRAs are described. Details of the extent of suitable habitat for species potentially occurring on the LOMCRAs is also described.

## Listed Species Descriptions

**Southwestern Willow Flycatcher (*Empidonax trailii extimus*)**

The southwestern willow flycatcher is a riparian obligate, neotropical migrant subspecies that nests along rivers, streams, or other wetlands where dense growths of shrubs and medium-sized trees are present, often with a scattered overstory of cottonwood. It is known to nest in thickets dominated by salt cedar (Sogge et al. 1997). In the Southwest, nesting habitat usually contains or is adjacent to water or saturated soil (Phillips et al. 1964, Muiznieks et al. 1994). Foraging habitat is typically riparian habitats, backwaters, and sandbars adjacent to nest sites (Sogge et al. 1997). The southwestern willow flycatcher was listed by the USFWS as an endangered species in February 1995 (60 FR 10694) and is currently listed as a Group 2 NESL species on the Navajo Nation (NNHP 2001).

Observations of willow flycatchers (*E. trailii*) have been recorded in the lower valleys throughout the region (La Rue 1994), but the subspecies of willow flycatcher observed has never been documented. Since there are at least three subspecies of willow flycatcher that could be present in the area during migration, it is impossible to determine the subspecies observed using visual characteristics. All drainage stringers that support salt cedar may be considered habitat. The J2/15 LOMCRA has such a habitat that bisects the area and the portion of Yellow Water Wash that borders the N9 North area also supports this habitat. None of the LOMCRAs have suitable breeding habitat however and any records of this species on LOMCRAs will undoubtedly be migrants.

**Black-footed ferret (*Mustela nigripes*)**

The black footed-ferret is listed as a Group 2 NESL species by the NFWD and is currently considered extirpated from the Navajo Nation. This species was listed as an endangered species by the USFWS on 11 March 1967 (32 FR 4001). The historic range of this ferret extends from the Great Plains of Canada to the inter-mountain region of the interior Rocky Mountains and the Southwest. In Arizona, the black-footed ferret's range probably coincided with that of Gunnison's prairie dog (*Cynomys gunnisoni*), from western Coconino County eastward, north of the Mogollon Rim, and possibly ranging south of the rim with black-tailed prairie dog *(Cynomys ludovicianus*) colonies in Graham and Cochise counties (Hoffmeister 1986). While no naturally occurring wild populations are known today, the ferret has been reintroduced successfully in northwestern Arizona and Wyoming. It has traditionally lived in prairies, almost exclusively in association with prairie dog towns as prairie dogs are the ferret's primary source of food. In addition, old prairie dog burrows are used by black-footed ferrets for denning, breeding, and raising their young (USFWS 1978). There are no known records of this species on Black Mesa and this species will not be affected by ground disturbance activities.

**Northern Leopard Frog (*Rana pipiens*)**
Northern leopard frogs are found in a variety of habitats including, grassland, brushland, woodland, and forest, ranging from near sea level to high elevation mountain areas. Areas where this species is found are normally lacking bullfrogs (*Rana catesbiana*) and introduced fish (Hayes and Jennings 1986, Rosen et al. 1996). It may forage at a distance from water in damp meadows. This species is fairly resistant to disturbance as long as adequate buffers are kept around water sources where this species is found. At present nearly all of the known populations of this Group 2 NESL species are now considered extirpated on the Navajo Nation (personal communication, David Mikesic, NFWD, August 2003). Currently, there are no suitable habitats for this species on Black Mesa, and there are no known documented historic records for the northern leopard frog on Black Mesa. Although the many water impoundements that now occur on the leasehold and on areas adjacent to the leasehold, could potentially support this species, there is no natural method for introduction of leopard frogs onto the Black Mesa monocline.

**Golden Eagle (*Aquila chrysaetos*)**
The golden eagle, a Group 3 NESL species, is a large raptor that is found throughout North America, most frequently in open areas, especially where large, steep cliffs or tall, coniferous trees are present, providing nesting locations at the edges of foraging territories. Most nesting areas are perennial and are occupied by the same breeding pair for many years (Ehrlich et al. 1988). In most of the West, adults remain on territories throughout the year; Black Mesa is no exception to this rule. Golden eagles typically prey upon small to medium sized vertebrate prey including rabbits, snakes, and ground squirrels. Golden eagles have been near Lolomi Point, and near Kayenta Point. Golden eagles are sparse permanent residents of Black Mesa and there is evidence that this species occasionally occurs on the leasehold to forage on prairie dog towns on the southern end of the mine leasehold. Specific records for this species on the leasehold are not available.

**Ferruginous Hawk (*Buteo regalis*)**
The ferruginous hawk, a Group 3 NESL species, is a large raptor that is closely related to the red-tailed hawk (*Buteo jamaicensis*). It is the largest *Buteo* hawk in North America and is found breeding in open country from the Great Plains to southern California, Nevada, and eastern Washington and Oregon with sporadic records east of the Great Plains (Sibley 2000). Ferruginous hawks use perennial nest sites located in trees, on cliff faces, or on the ground. Prey includes small mammals and other small vertebrates and population fluctuations appear to be closely tied to jackrabbit abundance. On the Navajo Nation, nesting sites are known from juniper (*Juniperus* sp.) trees and transmission lines, but are associated with areas where preferred prey, jackrabbits (*Lepus californicus*) and cottontail (*Sylvilagus* spp.) occur. Ferruginous hawks are migratory and winter in the southwestern U.S. and Mexico.

On Black Mesa, ferruginous hawks have been observed both on and off the leasehold. On the Navajo Nation, nesting sites are known predominantly (~90%) from short cliffs, badland bluffs and pinnacles, or erect sandstone structures. Similar types of habitats occur on the LOMCRAs, but there are no records for this species breeding on Black Mesa. One summer record of an adult dark morph suggests that breeding may have occurred on or near Black Mesa since mining began (LaRue 1994). The lagomorph community and the large prairie dog colonies may attract this species during the fall and spring months when migrants are common throughout Arizona, but the potential for breeding pairs to establish on the leasehold is low.

**Mexican spotted owl (*Strix occidentalis lucida*)**

The Mexican spotted owl is listed as a Group 3 species on the NESL and is listed as threatened by the USFWS (58 FR 14248). The Mexican spotted owl has a wide but patchy distribution throughout Arizona (except for the southwestern portion of the state where it is absent). Throughout the majority of the state this species inhabits rocky canyon lands and coniferous forests. Ganey and Balda (1989) found this species only in forested highlands, at elevations ranging from 3,690 to 12,100 feet. Suitable habitat is generally described as having relatively closed canopy made up of ponderosa pine, mixed conifer forest, and associated with steep canyons (AGFD 1988; Ganey and Balda 1994). Nests are typically in trees, on platforms such as old squirrel nests or other raptor nests, in tree cavities formed by broken off branches or tops of witches brooms, or in rock cavities or caves. The diet of the spotted owl can be varied, consisting of small mammals, birds, lizards, bats, beetles, and rabbits, although woodrats (*Neotoma* sp.) are the most common and important prey item range wide (Ganey and Balda 1985, Johnson and Johnson 1985). Foraging typically takes place at night.

Mexican spotted owls have been studied extensively on Black Mesa, where this species is a permanent resident. Intensive monitoring was conducted from 1994 to 2000 and results are presented in PWCC annual wildlife monitoring reports and Chapter 10, Fish and Wildlife Resources, in the PAP. Mining activities on the northern edge of the leasehold initiated surveys and additional studies, and formal monitoring and other studies were ongoing between 1982 and 2000. All nesting records for this species have been in mixed conifer habitats, many within two miles of the leasehold's northern boundary. The LOMCRAs that are closest to potentially active Mexican spotted owl breeding locations are the N9, N10 and N99 North LOMCRAs. There are no suitable breeding habitats within any of the LOMCRAs, but movements of this species are unknown during winter periods. To date, there has been no evidence that Mexican spotted owls use mine reclamation or adjacent undisturbed pinyon-juniper habitats on the leasehold. The closest known records of Mexican spotted owl to the PWCC Leasehold have been monitored in Yellow Water Canyon and in side canyons of Coal Mine Wash and Moenkopi Wash.

**Northern Goshawk (*Accipiter gentilis*)**

Northern goshawks nest in large forest stands characterized by a canopy cover greater than 50% and sparse understory vegetation (Johnsgard 1990). The northern goshawk is a Group 4 NESL species. In the Southwest, goshawks are most frequently found in pine forests with open park-like understories. Stands of old growth trees are preferred for nest sites but the species has been known to nest in young second growth forest, as long as older trees remain in the stand. Nest height is typically between 60 and 140 feet, but most studies of nesting northern goshawks have been conducted in stands of tall timber (i.e. ponderosa pine (*Pinus ponderosa*), or Douglas fir

(*Pseudotsuga menseizii*)(Siders and Kennedy 1994).

Northern goshawk habitat consists of three critical elements (Reynolds et al. 1992). The first is a nesting area of approximately 30 acres containing one or more stands of large, old trees with a dense canopy cover. The nesting area should contain three suitable nesting sites, with three additional alternative nesting sites. Nesting sites are typically located in northerly aspect drainages or canyons near a source of water. The second habitat element is a Post Fledgling Area (PFA) of approximately 420 acres surrounding the nesting area. This area is important for fledged nestlings to hunt and hide from predators. The PFA must contain a variety of forest types and conditions including patches of dense trees, a developed herbaceous and/or shrubby understory, and prey habitat attributes such as snags, downed logs, small forest openings ($^1/_3$ to 4 acres), and woody debris. The majority of the PFA is forest of mid-aged, mature, or old trees with an intermixture of forest vegetative stages, supporting prey species including squirrels, rabbits, woodpeckers, jays, and grouse. The third element of goshawk habitat is a foraging area of approximately 5,400 acres. The foraging area must contain similar attributes as the PFA, however a more open canopy is suitable without the need for fledgling protection.

LaRue (1994) reported one nesting record for northern goshawk on Black Mesa nesting in a dense pinyon-juniper stand in White House Valley during the breeding season of 1993. Recent historic records also suggest that northern goshawks are more abundant during the winter month, especially during some years (LaRue 1994). Most of the nesting records are from mixed conifer habitats and large stands of ponderosa pine, north of the leasehold. An aggressive female was observed during the 2001 field season approximately 2 miles north of the leasehold in Yellow Water Canyon. Potentially suitable breeding habitat on LOMCRAs exists in the N99 North, N10, and N9 LOMCRAs.

**Northern Saw-whet Owl (*Aeoglius acadicus*)**

The northern saw-whet owl, a Group 4 NESL species, is a small migratory raptor that inhabits ponderosa pine, pine-oak, and mixed conifer woodlands of the western U.S. (Ehrlich et al 1988). This species nests in abandoned woodpecker holes or natural cavities and forages mainly on rodents. The northern saw-whet owl is listed as a Group 4 species on the NESL, mainly due to a poor understanding of the species distribution on the Navajo Nation (Mikesic and Nystedt 2001). Although this species probably breeds on Black Mesa, there are no current records of breeding (La Rue 1994). This species has been observed and heard numerous times in the vicinity of Owl Canyon (west of road to Kayenta Point) and other locations on the northern edge of Black Mesa, but no records are known from the mine leasehold. All locations where this species has been identified are characterized by well-developed forest habitat including ponderosa pine and Douglas fir or well-developed pinyon pine woodland adjacent to mixed conifer woodland. The habitats represented within the LOMCRAs do not provide suitable nesting habitat for this species and it is unlikely that the species would occur on any of the LOMCRAs.

**Mountain Plover (*Charadrius montanus*)**
The mountain plover is a migratory shorebird, similar in size to the killdeer (*Charadrius vociferus*), but lacking the bold markings on the neck and around the eye (Sibley 2000). This species is typically found far from water, where it breeds in shortgrass prairie, rolling grasslands, and badlands frequently with more than 33% bare ground (Ehrlich et al. 1988). This species breeding range extends from Montana, Wyoming, and eastern Colorado, to New Mexico, and the Oklahoma, and Texas panhandles. Wintering areas are typically southern Arizona, New Mexico, Texas, California, and northern Mexico. Migration habitat is similar to breeding habitat. In some areas this species is found preferentially near prairie dog (*Cynomys* sp.) and bannertail kangaroo rat (*Dipodomys spectabillis*) colonies. This species is listed as a Group 4 species on the NESL and has been proposed for listing as a threatened species by the USFWS (68 FR 8487).

The only known breeding records for this species that have been documented in northwestern New Mexico, occur on the Navajo Nation, where 11 plovers were recently found breeding in badland habitats with low vegetative cover (USFWS 2002; 67 FR 72396). Vegetative coverage suggests that the LOMCRAs on the southwestern end of the leasehold should be considered suitable breeding habitat so there is potential for this species to occur on the project area. The presence of large colonies of prairie dogs on the J5/6/13/14 and J8 LOMCRAs, and the low vegetative cover produce potential breeding habitat for this species. There are no records of this species on Black Mesa.

Mountain plovers generally leave breeding areas shortly after breeding is completed and post-breeding movements are well underway by August (64 FR 7587). Recent precipitous, range-wide declines in the populations of this species have prompted the USFWS to reopen the comment period for the listing of the mountain plover.

**Peregrine Falcon (*Falco peregrinus*)**
The peregrine falcon was originally listed as endangered on 2 June 1970 (35 FR 8591) after precipitous declines in populations, attributed to effects from pesticide use. After successful recovery, the peregrine falcon was removed from the USFWS list of endangered species on 25 August 1999 (64 FR 46541); it remains a Group 4 species on the NESL. Peregrine falcons are found throughout the U.S. and, on the Navajo Nation, are found where steep-walled canyons and cliff habitats occur. Nesting sites are usually located in close proximity to water, especially in the Southwest (Skaggs et al. 1986). Johnson et al. (1977) found some of the highest breeding bird densities in North America in southwestern riparian habitats. Nests are sometimes found on man-made structures such as building ledges and bridges (usually as a result of hacking programs). The density of cliffs may determine the suitability of an area for nesting.

On the Navajo Nation, peregrine falcons have been known to nest on cliffs of 150 feet high or less, but usually breed on tall, extensive cliffs, 300 feet in height or greater. The best peregrine nesting habitat on the Navajo Nation occurs in the canyons and cliffs on the forest edge. Such areas include Canyon de Chelly and the sandstone cliffs near Navajo, New Mexico, where falcons are known to nest regularly.

Suitable nesting habitat occurs on the northern edge of Black Mesa and in the steep-walled canyons on the northern portion of Black Mesa. Several historic nesting sites were monitored annually by PWCC until the 2001 field season. Several permanent ponds are used as foraging habitat by peregrine falcons that breed on the northern rim. Historic records collected by PWCC have documented peregrine falcons preying upon horned larks (*Eremophila alpestris*) on mine reclamation, Baird's sandpipers (*Calidris bairdii*) over N2 reclamation, and mourning dove (*Zenaida macroura*) in Long House Valley. Peregrine falcons have been observed during annual monitoring hunting waterfowl on the J7 pond, the N14 ponds, and the N1-RA basin of the N1-2 reclamation. Observations documented during PWCC annual monitoring have occurred between March and September.

None of the LOMCRAs provide suitable nesting habitat for peregrine falcons, but all areas that support adequate numbers of birds may be potentially suitable foraging habitat. Such LOMCRAs include the N9, N10, N99 North, and N12/N99 South LOMCRAs. These areas all have well-developed pinyon-juniper woodland where prey species (especially jays and mourning doves) are found.

**Northern Pygmy Owl (*Glaucidium gnoma*)**
The northern pygmy owl is found throughout the forested portions of the western U.S. (Ehrlich et al. 1988). This species is listed as a Group 4 species on the NESL and breeding records of this species on the Navajo Nation are sought by the NFWD. Breeding records for this species are known from the Chuska Mountain range and Tsegi Canyon (Mikesic and Nystedt 2001). This species typically occupies dense coniferous or deciduous woodland habitats and on Black Mesa is known from mixed conifer habitats (LaRue 1994) in Coal Mine Wash and Yellow Water Canyon areas. There are no records for this species within the 2-mile Black Mesa buffer zone.

No mixed conifer habitat occurs on the LOMCRAs and it is unlikely that this species would be found within any of the LOMCRAs. This species is suspected to move to lower elevations during the winter months and since records of this species are known from Yellow Water Canyon, an area adjacent to the N9 LOMCRA, some portions of the northern LOMCRAs may be used during winter. Mining in these areas will not affect this species.

**Navajo Mountain Mexican Vole (*Microtus mexicanus navaho*)**
The Navajo Mountain vole is one of three recognized subspecies of Mexican vole found in Arizona (Hoffmeister 1986). This species is listed as a Group 4 species on the NESL. Compared to the other two subspecies, *Microtus mexicanus mogollonensis* and *M. m. hualapaiensis*, this subspecies is characterized by smaller size in all external and most cranial measurements, and by having a lighter dorsal coloration. Navajo Mountain Mexican voles (hereafter Mexican vole) were originally identified on Navajo Mountain, on the Arizona-Utah border, but have also been documented in other areas of Arizona. Other areas include south of the Grand Canyon, on the San Francisco Peaks, near Williams, and on the sky islands of the Navajo Nation, including Black Mesa.

Mexican voles are typically inhabitants of dry, grassy areas and are the most widely distributed Microtine rodent in Arizona (Hoffmeister 1986). These animals have been trapped in all life zones from pinyon-juniper to spruce-fir. Where they are found, they can occur in high densities

and have been captured in close proximity to other *Microtus* species. Mexican voles have relatively low reproduction rates with litters averaging two embryos (Hoffmeister 1986). Reproductively active individuals have been found to be pregnant in all months of the year, but reproduction is generally limited to periods of snow absence (Hilton 1992).

On Black Mesa, previous baseline studies of the leasehold describe this species as rare in abundance, and found in areas of rocky substrates (LaRue 1994). Mexican voles have also been trapped in continuous stands of sagebrush, near permanent impoundments on mine reclamation, and along drainage bottoms (LaRue et al. 1994, Marshall 1999). Where this species occurs, it may be numerous. During the 1999 field season, live trapping was conducted in closed basins within mine reclamation, and on mine reclamation grasslands (Marshall 1999). Over 2,940 trap nights, a total of 28 Mexican voles were captured in closed reclaimed basins and no Mexican voles were captured on reclamation grassland. The number of Mexican voles captured represented 21% of the total number of rodents captured during the study. The presence of this species near water impoundments suggests an affinity for more mesic habitats that support a higher abundance of herbaceous ground cover with a taller mean vegetation height.

Habitat, in the form of contiguous sagebrush stands (Attachment B, Photo 3), and drainage stringers with salt cedar, is present for this species in the N10, N99 North, and the J2/15 LOMCRAs. The total acreage of suitable habitat in each of these LOMCRAs is 40.8, 27.8, and 1.6 acres respectively for a total of 70.2 acres across all LOMCRA study areas. An extensive amount of time was spent searching suitable habitat within these LOMCRAs to identify potentially occupied habitat. Runways were found in the J2/15 LOMCRA, within the narrow drainage that bisects the two LOMCRAs (Photo 4). This set of runways appeared to be active, but no trapping was conducted to ascertain the presence of this species. The past three years have been characterized by unusually low rainfall throughout the Southwest and rodent populations appear to be at an extreme low (personal observation). Certain populations of Microtine rodents with less favorable habitat conditions may become extirpated during these periods of environmental harshness, so the status of such populations in future years should be monitored accordingly.

**Flammulated Owl (*Otus flammeolus*)**

The flammulated owl is listed as a Group 4 species on the NESL, and is protected federally under the MBTA. This small owl primarily forages on insects, preferably in mature stands of pine forests and upper oak woodlands. Flammulated owls nest in tree cavities and can be found in any ponderosa pine, oak, and mixed-conifer stands where sufficient cavities are present (Lesh et al. 1994; McCallum et al. 1995). Nests are built in abandoned woodpecker holes, especially those of flickers. On Black Mesa, this species is known from numerous areas north of the mine leasehold, especially where stands of ponderosa pine (*Pinus ponderosa*) or Douglas fir (*Pseudotsuga menzeizii*) are found in close proximity to pinyon-juniper woodland (LaRue 1994). This species has been identified just north of the PWCC Leasehold boundary in Yellow Water Canyon, where a male was heard calling regularly between the 1997-2000 field seasons. Although suitable habitat can be found within two miles of the mine leasehold, there is no suitable habitat on the proposed LOMCRAs.

**Townsend's Big-eared Bat (*Plecotus townsendii*)**
The Townsend's big-eared bat is listed as a Group 4 species on the NESL, but has no federal listing status. In Arizona, this bat is widespread, although not apparently common anywhere within its range. While they can be found in a variety of habitat types, including arid desert scrub, pinyon-juniper, and ponderosa pine habitats, they prefer to forage in riparian areas and forest edges. They feed primarily on moths, but will also feed upon other insects including lacewings and beetles (Sample and Whitmore 1993). Townsend' s big-eared bats inhabit mines, caves, and large crevices during the day, and often rest in abandoned buildings at night (Hoffmeister 1986). These bats are also found near open water. During the summer, females congregate in caves to form maternity colonies

This species has not been documented during field studies on Black Mesa, but is suspected to occur on Black Mesa (Hoffmeister 1986). Habitat on the LOMCRAs includes dry drainage basins and small openings within the pinyon-juniper woodland. Roost sites occur on some of the LOMCRAs where cliff faces or sandstone bluffs occur. These areas may provide adequate day roosts and hibernacula. Given the presence of similar and more suitable habitats throughout northern Black Mesa off the leasehold, ground disturbance activities on the LOMCRAs are not expected to affect this species.

**Kit Fox (*Vulpes macrotis*)**
The kit fox is the smallest of North American canids and can be found inhabiting the bleak deserts of the western U.S. (MacDonald 1995). This species is identified by unusually large, buff-colored, ears, black tail tip, and a uniform colored body (Hoffmeister 1986). Dens having a characteristic key-shaped opening are excavated in desertscrub and badland habitats characterized by softer soils. Vegetative associates include saltbush, sagebrush, and black greasewood (*Sarcobatus vermiculatus*)(Mikesic and Nystedt 2001).

The San Joaquin kit fox (*Vulpes macrotis mutica*) was listed as endangered by the USFWS on 11 March 1967 (32 FR 4001). The subspecies of kit fox known from the Navajo Nation (*V. macrotis macrotis*) is listed as a Group 4 species on the NESL, but has no current federal status. Kit fox are known on the Navajo Nation from the eastern side of the Chuska Mountains and in the Chinle Valley in Arizona and Utah. Potential habitat exists throughout the Navajo Nation and the habitat found on some of the LOMCRAs is suitable for this species. Such habitats would include the large areas of greasewood, sagebrush, and saltbush on some of the southern LOMCRAs including J8, J2/15, J5/6/13/14, and J23.

**Bald Eagle (*Haliaeetus leucocephalus*)**
The bald eagle, a Group 4 NESL species, is distributed from Alaska and northern Canada to north central Mexico. Bald eagles primarily eat fish, but are also know to eat other small vertebrates and carrion. Winter diets for bald eagles can vary depending upon location and food sources, but wintering eagles generally depend on waterfowl and carrion and less upon fish (Busch 1986). Bald eagle breeding habitat is characterized by large trees, suitable for nesting, with a nearby water source that provides an adequate supply of moderate-to-large size fish (Johnsguard 1990). Breeding habitat for bald eagles in the Southwest is almost exclusively tied to water sources (Hunt et al. 1992). Bald eagles winter throughout much of the southern United States. Wintering habitats for bald eagles are less closely associated with water than summer habitats (Evans 1982). Roost sites important to bald eagles are usually in fairly open stands with trees that are taller than surrounding canopy (Stalmaster and Newman 1978, Keister and Anthony 1983).

Habitats of the LOMCRAs should generally be considered unsuitable foraging or breeding habitats for bald eagles. Foraging exceptions would be carrion (in the form of dead cattle or sheep), or terrestrial mammals, which may present foraging opportunities for migrating bald eagles. Pinnacles or other tall perching areas near ponds including the J-7 pond, Wild Ram tank, and N14-D ponds may be useful for migrating bald eagles due to the presence of fish, but these areas would only be used temporarily. Bald eagles have been observed in Coal Mine Wash, Moenkopi Wash, Dinnebito Wash, and lower Yellow Water Canyon. Two adults were also observed at the J7 pond in January of 1985 (LaRue 1994) and this species was observed near the haul road, just south of the N1-RA pond during the 1999 field season.

# Summary

A total of 7 mammalian, 23 avian, and 5 herpetile species were identified during a general inventory of wildlife on the LOMCRAs. These species have been documented during other wildlife baseline studies and would be expected in similar pinyon-juniper habitats throughout northern Arizona. None of the species observed during baseline studies in 2003 are of special interest, but some avian species (neotropical migrants) are of importance to the NFWD, which request data collection for these species prior to surface disturbance events.

A total of 16 species listed on the NESL were identified as occurring or potentially occurring on or near the LOMCRAs. Species for which potentially suitable habitat is not present on the LOMCRAs were not addressed in this report. Although habitat for the black-footed ferret is present on the J8 and J5/6/13/14 LOMCRAs, it is unlikely that black-footed ferrets occur on Black Mesa. However, PWCC has an approved black-footed ferret monitoring plan (PAP, Chapter 10, Attachment 2) that is ongoing for the PWCC Leasehold including the LOMCRAs. Ongoing wildlife monitoring activities will determine the extent of prairie dog colonies on an annual basis. Should black-footed ferret surveys be required in the future, PWCC will initiate species-specific spotlighting surveys.

The large prairie dog colonies found on J8 and J5/6/13/14 are potentially suitable breeding habitats for the mountain plover. Reduction in vegetation height increases the suitability of a grassland or short shrubland habitat to support the mountain plover (Ehrlich et al. 1988, USFWS, 68 FR 8487). Although this habitat is present, it is unlikely that this species occurs on the PWCC Leasehold. Should this species be identified on any of the suitable LOMCRAs, surveys and monitoring would be necessary to determine impacts of mining on this species. Numerous locations found on mine reclamation where ground-level vegetation is short (pre-reclaimed open topsoil or overburden areas) provide suitable habitat for the mountain plover also.

Just as prairie dog colonies provide suitable habitat for mountain plover, they also provide a foraging resource for raptors. Suitable breeding habitat for the ferruginous hawk is found on the southern LOMCRAs where bluffs overlook large expanses of open country (J2/15, J4/5/13/14, and J8). Likewise, these prairie dog colonies provide foraging habitat for the golden eagle, bald eagle (although this species is probably absent during periods of prairie dog activity), and kit fox which may also breed in these areas. No known breeding records for kit fox occur on the leasehold.

Southwestern willow flycatchers may occur in any habitat during migration, but the chances of a known southwestern willow flycatcher occurring in any drainage on or near the proposed LOMCRAs is slim. Although willow flycatchers of undetermined subspecies have been observed on the leasehold, *E. trailii extimus* has never been confidently identified (territorial calling during multiple periods of the breeding season) on the leasehold.

The northern leopard frog has not been documented on Black Mesa and is unlikely to occur on the leasehold. Since there are no wetland habitats found within any of the LOMCRAs, the lack of habitat would exclude the presence of this species, even if an unknown source population occurs on Black Mesa. This species will not be affected by surface disturbance activities associated with mining activities on LOMCRAs.

Some sections of suitable habitat for the Navajo Mountain vole are found within the boundaries of the proposed LOMCRAs. Pedestrian transects were conducted within these strings of habitat and runways were identified within one LOMCRA (Attachment B, Photo 3). Approximately 70.2 acres of Navajo Mountain vole habitat are found on the LOMCRAs.

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# ATTACHMENT A

Map 1. LOMCRAs and Potential TES Habitat
Map 2. Northern Goshawk Survey and Raptor Responses

# ATTACHMENT B

Photos 1-4. LOMCRA Study Area Photos

Photo 1. Late seral pinyon-dominated pinyon-juniper woodland. Similar structure is found in N9, N10, N99 North, and N12/N99 South. This patch is a monitoring patch for vegetative monitoring.

Photo 2. Habitats representative of the southern LOMCRAs. Note the reduction in vegetative cover and canopy height of juniper-dominated pinyon-juniper woodland.

Photo 3. Contiguous sagebrush stands in the N10 LOMCRA. Note the shrub density and proximity to pinyon-juniper woodland edge. This photo was taken in a drainage bottom and the habitat is suitable for Navajo Mountain Mexican vole.

Photo 4. Mexican vole runway in a drainage bottom of the J2/15 LOMCRA. The current status of this population is unknown, but appeared inactive.