

LIST OF TABLES (Cont.)

	<u>Page</u>
Table 30. Summary of Spotted Owl Observations and Nest Sites in Relation to Surface Mining and Other Disturbances	71f
Table 31. Attribute Comparison Between Mixed Conifer Woodland and Pinyon-Juniper Woodland	71g

ATTACHMENTS

- Attachment 1. Reference Listing for Studies and Information
Relevant to Fish and Wildlife Resources on or Near
the Black Mesa Leasehold
- Attachment 2. Peregrine Falcon and Black-Footed Ferret Monitoring Plan
for the Black Mesa and Kayenta Mines
- Attachment 3. Air Overpressure Attenuation in the N-10 Area
- Attachment 4. Biological Report: Wildlife and Habitat Reconnaissance of
Proposed Life of Mine Coal Resource Areas, Black Mesa and
Kayenta Mines, Black Mesa, Arizona (Includes the N12/N99
North/South Areas)
- Attachment 5. Final Biological Report: General Biological Survey of the
Proposed J23 Corridors, Black Mesa, Arizona
- Attachment 6. Final Biological Report: General Biological Survey of the
J-9 Project Area and Navajo Route 41 Realignment,
Black Mesa Mine, 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 J-23 transportation corridors and the J-9 Coal Resource Area in 2000 and the remaining Black Mesa leasehold life of mine coal resource areas (LOMCRA) in 2003. These studies can be found in Attachments 4,5, and 6.

The objective of this chapter is to provide a detailed description 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 that has been 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 being disturbed. The 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 RECONNAISSANCE
OF PROPOSED LIFE OF MINE COAL RESOURCE AREAS,
BLACK MESA AND KAYENTA MINES, BLACK MESA ARIZONA
(Includes N12/N99 North/South Study Area)

ATTACHMENT 5

FINAL BIOLOGICAL REPORT: GENERAL BIOLOGICAL SURVEY OF THE
PROPOSED J23 CORRIDORS, BLACK MESA ARIZONA

FINAL BIOLOGICAL REPORT:

GENERAL BIOLOGICAL SURVEY OF THE
PROPOSED J-23 CORRIDORS, BLACK MESA MINE,
BLACK MESA, ARIZONA.

Submitted To

Peabody Western Coal Company
Post Office Box 650, Navajo Route 41
Kayenta, Arizona 86033
(520) 677-3201

Prepared By

SWCA, Inc.,
Environmental Consultants
114 North San Francisco Street
Flagstaff, Arizona 86001
(520) 774-5500

30 July 2001

CONTENTS

Introduction.....	1
Project Description.....	1
Special Status Species Reconnaissance.....	1
Species Descriptions.....	2
Methods.....	5
WC species reconnaissance.....	5
Species-specific surveys.....	5
Results.....	5
WC reconnaissance.....	5
Species-specific surveys.....	6
Other wildlife species.....	6
Discussion.....	6
Effects of mine expansion on listed species.....	6
Effects of mine expansion on other wildlife species.....	7
Conclusions.....	8
Literature Cited.....	9

List of Tables

Table 1. Status of listed species potentially occurring within the proposed J-23 corridors.....	2
Table 2. Wildlife species observed during survey of J-23 corridors.....	6

List of Attachments

Attachment A: Drawing 1. Proposed J-23 Corridors, Habitat, and Survey Stations.

INTRODUCTION

Peabody Western Coal Company (PWCC) has conducted baseline and/or ongoing wildlife monitoring studies in and surrounding the Black Mesa Complex leasehold since 1979 (PWCC 1985). PWCC is considering extending mine operations to the J-23 mine plan area necessitating the evaluation of haul roads or conveyor belt line/corridors for coal transportation between the Black mesa Mine coal preparation facilities and the J-23 area. To determine the potential impacts of construction of haul roads or conveyor belt lines from the J-23 extension area, SWCA, Inc., Environmental Consultants (SWCA) was contracted by PWCC to conduct a supplemental biological survey (survey) of the proposed corridors. The survey was conducted to determine the presence of U.S. Fish and Wildlife Service (USFWS) and Navajo Nation Fish and Wildlife Department (NNFWD) listed Threatened and Endangered (T&E) species and Arizona Game and Fish Department (AGFD) Wildlife of Concern (WC). This included determining the suitability of habitat, and presence of, Cooper's hawks (*Accipiter cooperii*) and northern goshawks (*Accipiter gentilis*). A listed species survey and assessment of potential impacts due to the proposed construction was completed during the spring of 2000. In addition to the species-specific and habitat surveys, biologists conducted nest searches along, or adjacent to, centerlines of haul road corridors in suitable Cooper's hawk and northern goshawk breeding habitat.

Project Description

The proposed corridors encompass approximately 3,418 acres of pinyon-juniper woodland and Great Basin sagebrush habitats at elevations ranging from 6,700 to 7,000 feet. Vegetation height is low (<3 feet) in areas where trees are absent, to over 24 feet in wooded areas. Topography of the area is rolling hills dissected by ephemeral drainages. Typical plants found within the project area include Utah juniper (*Juniperus osteosperma*), pinyon pine (*Pinus edulis*), basin big sagebrush (*Artemisia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*). Sparse ground cover exists and is represented by snakeweed (*Gutierrezia sarothrae*), buckwheat (*Eriogonum* sp.), and rocketflower (*Ipomopsis* sp.).

Special Status Species Reconnaissance

To identify pertinent T&E/WC species potentially found on the proposed J-23 corridors, SWCA compiled a list of T&E/WC species from the USFWS, AGFD, and NNFWD based on habitat suitability. Due to lack of habitat or geographical range, none of the nine T&E species listed by the USFWS are expected to occur on the proposed J-23 corridors. Since no T&E species are expected to occur within the J-23 corridor alignments, they are not discussed in the remainder of this report.

WC species that may occur in the J-23 corridors include Navajo Mountain Mexican vole (*Microtus mogollonensis* [=mexicanus] navaho), northern goshawk (*Accipiter gentilis*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and American peregrine falcon (*Falco peregrinus anatum*). The USFWS, AGFD, and NNFWD status for each species is listed in Table 1.

Table 1. Status of listed species potentially occurring within the proposed J-23 corridors.

Common Name	Scientific Name	AGFD	USFWS	NNFWD
Golden eagle	<i>Aquila chrysaetos</i>	WC	MBTA/EPA	G3
American peregrine falcon	<i>Falco peregrinus anatum</i>	WC	MBTA	G4
Ferruginous hawk	<i>Buteo regalis</i>	WC	MBTA	G3
Navajo Mountain Mexican vole	<i>Microtus mexicanus navaho</i>	WC	none	G4
Northern goshawk	<i>Accipiter gentilis</i>	WC	MBTA	G4
Cooper's hawk*	<i>Accipiter cooperii</i>	None	MBTA	None

WC refers to Arizona Wildlife Species of Concern as listed by the AGFD; MBTA refers to the Migratory Bird Act (16 USC §§ 703 et seq.); EPA refers to the Bald and Golden Eagle Protection Act (16 USC § 668a-668d).

G3= NNFWD Group 3 Species (a species or subspecies whose prospects of survival or recruitment are in jeopardy).

G4= NNFWD Group 4 Species (a species or subspecies whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future).

* Although this species has no federal or state status, the species is monitored by PWCC and species specific surveys are conducted in conjunction with surveys for the northern goshawk.

Species Descriptions

For each of the species listed in Table 1, a brief natural history is given below. Potential habitat occurs for each of these species in the study area and this is the impetus for their inclusion. The lack of potential habitat for other species listed on the NESL precludes their discussion in this report. Although Cooper's hawks have no USFWS or AGFD listing status, this species is protected under the Migratory Bird Treaty Act (MBTA)(16 USC §§ 703 et seq.) and has been surveyed for, and monitored by, PWCC before initiating mine extensions.

Golden eagle (*Aquila chrysaetos*)

The golden eagle is a large raptor found throughout the northern hemisphere. Golden eagles can be distinguished from the similar bald eagle (*Haliaeetus leucocephalus*) by having a distinct gold-colored nape, tri-colored bill, and slight dihedral of the wings during flight (Peterson 1990). In the West, golden eagles typically occupy territories throughout the year, but are known to migrate as far south as central Mexico (Ehrlich et al. 1988). Nests are constructed of sticks and are lined with fine materials. Several nests are normally constructed in a territory and are used, alternately, year after year. Prey species include small mammals, especially jackrabbits (*Lepus* sp.), and carrion in areas where small mammal abundance is low. Golden eagles are protected under the MBTA and the Eagle Protection Act (EPA)(16 USC § 668a-668d) and are considered a WC by the AGFD. Golden eagles are found throughout Arizona in all mountainous regions (Monson and Phillips 1981).

American peregrine falcon (*Falco peregrinus anatum*)

Peregrine falcons are usually associated with cliffs or steep-walled canyon areas and nest almost exclusively on cliff faces. Nests are sometimes found on man-made structures such as building ledges and bridges. These are usually as a result of captive-bred release (hacking) programs. The density of cliffs may determine the suitability of an area for nesting.

Adequate prey populations close to the nest are also important criteria in site selection. 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. Riparian areas in the Southwest are used by many other bird species from nearby habitat types due to the lack of water elsewhere. Riparian areas also provide obvious migratory corridors and stopover points for migrating species, all of which provide a rich foraging area for locally nesting falcons (Skaggs et al. 1986).

Peregrine falcons have been delisted by the USFWS and are currently protected by the MBTA. This species is considered a WC by the AGFD. Peregrine falcons are found throughout the state in regions near cliffs and steep-walled canyons (Monson and Phillips 1981).

Ferruginous hawk (*Buteo regalis*)

The ferruginous hawk is a long-winged hawk identified by characteristic light primary patches forming a light-colored crescent at the wrist (Clark and Wheeler 1987). This hawk nests in open areas throughout the western United States and winters south into central Mexico (Ehrlich et al. 1988). Nests are typically perennial in nature and are constructed in large trees or on cliff faces. Prey items include small mammals, snakes, lizards, and large insects. Jackrabbits are the most commonly taken prey item; population fluctuations have been shown to closely correlate with jackrabbit abundance (Smith et al. 1981). This species is protected under the MBTA and is considered a WC by the AGFD. In Arizona, this species is a locally uncommon resident of the northern grasslands (Monson and Phillips 1981).

Navajo Mountain Mexican vole (*Microtus mexicanus navaho*)

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. Mexican voles have also been trapped in continuous stands of sagebrush. 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. 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).

The Navajo Mountain Mexican vole is one of three recognized subspecies of Mexican vole found in Arizona (Hoffmeister 1986). 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 were originally thought to be restricted in range to Navajo Mountain on the Arizona-Utah border, but have also been documented in other areas of Arizona, including south of the Grand Canyon, on the San Francisco Peaks, and around Williams. The Navajo Mountain Mexican vole is considered a WC by the AGFD.

Northern goshawk (*Accipiter gentilis*)

The northern goshawk is a forest hawk similar in size to the red-tailed hawk (*Buteo jamaicensis*). Mature individuals have a prominent white stripe above the eye and gray underparts that are finely barred. The tail is broader and more irregularly barred than that of the Cooper's hawk. The diet of the northern goshawk consists of birds and small mammals including golden-mantled ground squirrels (*Spermophilus lateralis*), cottontail rabbits (*Sylvilagus* sp.), Steller's jays (*Cyanocitta stelleri*), and northern flickers (*Colaptes auratus*) (Boal and Mannan 1994).

The northern goshawk is found throughout the forested regions of Eurasia and North America, where it prefers coniferous and deciduous woodlands especially in mountainous regions (Peterson 1990). In North America, the northern goshawk is found as far south as the Sierra Madres in Mexico. In Arizona, northern goshawks are considered sparse to uncommon residents in the forested regions throughout the state (Monson and Phillips 1981).

Northern goshawks nest most frequently in coniferous trees at heights of 20 to 60 feet (Ehrlich et al. 1988), but in the southeastern portion of their range deciduous trees are frequently used. Fifty percent of northern goshawks do not breed until their third year and there is some evidence of long-term pair bonds (Detrich and Woodbridge 1994). Females are especially defensive at nests and boldly attack humans. The northern goshawk is protected under the MBTA and is considered a WC by the AGFD.

Cooper's hawk (*Accipiter cooperii*)

The Cooper's hawk is a crow-sized woodland raptor characterized by short wings and a long rounded tail. They are found throughout the western U.S. from southern Canada to northern Mexico where mature forest, open woodlands, and woodland edges persist. Cooper's hawks can be found in a variety of habitats throughout Arizona (Monson and Phillips 1981).

This species can be distinguished from the sharp-shinned hawk (*Accipiter striatus*), a smaller and very similar relative, by larger size and a notably rounded tail in flight and when perched. Cooper's hawks are smaller and lack the prominent white eye stripe of their larger relative, the northern goshawk (Peterson 1990). Species preyed upon by Cooper's hawks include birds, small mammals, reptiles and amphibians (Ehrlich et al. 1988).

Cooper's hawks generally nest in coniferous or deciduous trees at heights of 40 to 66 feet (Ehrlich et al. 1988). The nest is chosen by the male and consists of sticks and twigs, but there are records of Cooper's hawks using abandoned crows nests or building over previously used nests (Bent 1961). Young are dependent upon their parents for 30 to 40 days after fledging (Ehrlich et al. 1988). Cooper's hawks are federally protected under the MBTA.

METHODS

WC Species Reconnaissance

A general reconnaissance was conducted on 7 to 9 June 2000, to determine the suitability of the habitats within the proposed J-23 corridors for WC species. Pinyon-juniper woodland habitat was assessed to determine the availability of suitable breeding habitat for raptors and suitable habitat for WC species. Potentially suitable trees were checked for active and inactive raptor nests. Other wildlife species and habitat for WC species was documented while surveyors conducted transects.

Species-specific Surveys

Species-specific surveys for Cooper's hawks and northern goshawks were conducted in the proposed J-23 corridors. Two complete field surveys were conducted, the first between 7 to 9 June 2000 and the second between 27 to 29 June 2000. Calling stations were established in potentially suitable nesting habitat, mostly along corridor centerlines. A total of 25 calling-stations in potentially suitable habitat were surveyed by SWCA biologists during each survey session (Attachment A, Drawing 1). Unsuitable nesting habitat (i.e. large open areas, or areas of inadequate canopy height) within the survey area was surveyed to assess the habitat for signs of breeding raptors and habitat for listed WC species.

SWCA biologists used Johnny Stewart game callers to broadcast tape-recorded northern goshawk alarm calls using an isolated calling station technique. Calls were broadcast at each calling station for one minute in each of the four cardinal directions followed by a one minute listening period. After the one minute listening period, this calling sequence was repeated. A total of ten minutes were spent at each calling station. All raptor species were documented at and between calling stations and during nest searches that were conducted for Cooper's hawks and northern goshawks in areas of potentially suitable habitat.

RESULTS

WC Species Reconnaissance

No golden eagle, American peregrine falcon, ferruginous hawk, or Navajo Mountain Mexican voles were observed during the reconnaissance of the proposed J-23 corridors. Although species-specific surveys for the Navajo Mountain Mexican vole were not conducted, no runways or haystacks were observed during the reconnaissance. No raptor nests were documented during the reconnaissance.

Species-specific surveys

During the first survey session on 7 June, a single American kestrel (*Falco sparverius*) responded to calls at survey point #5 (Attachment A, Drawing 1). A second American kestrel responded to calls at survey point #11. Both individuals were male and responded audibly to the goshawk alarm calls. These birds may nest in the area; however, no nest cavities were detected during the survey. No

other raptor sightings were documented during the first survey session.

On 28 June 1999, during the second survey session one American kestrel responded to a surveyor's call at survey station #5 (Attachment A, Drawing 1). No other raptor sightings were documented in the second survey session. No northern goshawks or Cooper's hawks were documented in the project area during either survey session.

Other wildlife species

A number of other wildlife species were observed during the survey effort. Table 2 (below) lists other species of wildlife observed during the survey efforts.

Table 2. Wildlife species observed during survey of J-9 coal resource area.

Common Name	Scientific Name	Common Name	Scientific Name
pinyon jay	<i>Gymnorhinus cyanocephalus</i>	gray flycatcher	<i>Empidonax wrightii</i>
western scrub-jay	<i>Aphelocoma californica</i>	black-throated gray warbler	<i>Dendroica nigrescens</i>
western bluebird	<i>Siala mexicana</i>	common raven	<i>Corvus corax</i>
juniper titmouse	<i>Baeolophus ridgwayi</i>	Bewick's wren	<i>Troglodytes bewickii</i>
spotted towhee	<i>Pipilo maculatus</i>	rock squirrel	<i>Spermophilus variegatus</i>
common bushtit	<i>Psaltriparius minimus</i>	black-tailed jackrabbit	<i>Lepus californicus</i>

DISCUSSION

Effects of mine expansion on listed species

On Black Mesa, northern goshawks are common winter visitors and have been found nesting in mixed-conifer and dense pinyon-juniper woodlands (LaRue 1994). Cooper's hawks have been found nesting in higher elevation pinyon-juniper stands (where juniper appears to be selected as nest sites), and mixed-conifer woodland. The habitat of the project area consists of pinyon-juniper woodlands with canopy heights ranging from <3 to approximately 24 feet. Although this habitat can support breeding Cooper's hawks and northern goshawks, breeding habitat is marginally suitable for these species throughout the project area. Both species have been known to nest in marginally suitable woodlands and therefore may not be ruled out by canopy height alone (Ehrlich et al. 1988).

Although pinyon-juniper habitat is patchy throughout the J-23 corridors, the sagebrush habitat is good for prey species such as black-tailed jackrabbits and rock squirrels. Neither Cooper's hawks nor northern goshawks were documented during the survey, but potential breeding habitat does exist for these species within the proposed J-23 corridors. Construction within the proposed coal transportation corridors is not expected to impact breeding Cooper's hawks or northern goshawks.

While foraging habitat for golden eagles exists there is no suitable nesting habitat available. Golden eagles are known to migrate through the area and have been known to nest on the eastern edge of Black Mesa (LaRue 1994). Haul road construction in the proposed J-23 corridors will have no impact on the nesting habitat of this species.

Although human activities near the nest site and destruction of habitat for prey species can affect nesting peregrines by causing nest failure, no nesting habitat is present within the proposed J-23 corridors. Nesting habitat for the American peregrine falcon is known from the east edge of Black Mesa. However, destruction of prey habitat has been documented to cause nest failure due to the lack of adequate prey during the breeding season (Ellis 1982). Since there is no wetland habitat which may attract migratory waterfowl in the proposed J-23 corridor alignments, expansion in this area will not impact foraging habitat.

Nesting and foraging habitat occurs on the proposed J-23 corridors for the ferruginous hawk. This species is uncommon in northern Arizona and has been found wintering over Black Mesa; no breeding records have been identified to date and the status of this species on Black Mesa is unknown. Mine activities in the proposed coal resource area should have no impacts on ferruginous hawks on Black Mesa.

The Navajo Mountain Mexican vole is known from locations on, and surrounding, PWCC's Black Mesa and Kayenta mines. Available habitat for Mexican voles on Black Mesa includes several habitat types. These include: large continuous stands of big sagebrush (*Artemisia tridentata*), the grassy bottoms of the many large canyons that bisect northern Black Mesa, the edges of the numerous impoundments found on mine reclamation areas, several closed basins on mine reclamation areas, and the riparian corridors found on the southern portions of the Black Mesa monocline (LaRue et al. 1990; PWCC 1985). Continuous stands of basin big sagebrush are present, but do not occur on a significant portion of the J-23 corridors. Construction within the corridors should not impact the Navajo Mountain Mexican vole.

Effects of mine expansion on other wildlife species

Construction within the proposed corridors may impact nesting habitats of all of the observed resident and migrant birds. However, the area surrounding the proposed J-23 corridors consists of similar pinyon-juniper and Great Basin sagebrush shrubland and construction would likely displace these species to areas immediately adjacent to the J-23 corridors. Resident species which utilize pinyon-juniper and Great Basin shrubland habitats may be permanently displaced, but given the area of similar habitats surrounding the proposed J-23 corridors, construction should have little impacts on these species.

CONCLUSIONS

Construction within the proposed J-23 corridors should have no impacts on NNFWD listed T&E or WC species. Other wildlife species will be displaced to adjacent habitats, but the construction will not affect the viability of these species on Black Mesa. The area is currently used for livestock grazing and no listed species are known to occur within the boundaries of the proposed mine expansion area. Although foraging habitat for listed avian species is present, the alteration of pinyon-juniper and Great Basin shrubland within the proposed corridors, should have little, if any, adverse, long-term impacts on WC or other wildlife species.

LITERATURE CITED

- Bent A.C. 1961. Life histories of North American birds of prey, Part 1. Dover Publications, New York, NY. 409 pp.
- Boal, C.W. and R.W. Mannan. 1994. Northern goshawk diets in ponderosa pine forests on the Kaibab Plateau *in* The northern goshawk: ecology and management. *Studies in Avian Biology* 16: 97-102.
- Clark, W.S. and B.K. Wheeler. 1987. A field guide to hawks of North America. Houghton Mifflin Company. New York, New York. 198 pp.
- Deitrich, P.J. and B. Woodbridge. 1994. Territory, mate fidelity, and movements of color-marked northern goshawks in the southern cascades of California *in* The northern goshawk: ecology and management. *Studies in Avian Biology* 16: 130-132.
- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The birders handbook. Simon and Schuster, Inc. New York, NY. 785 pp.
- Ellis, P.H. 1982. The peregrine falcon in Arizona: Habitat utilization and management recommendations. Institute for Raptor Studies, research report No.1. Oracle, Arizona. 24 pp.
- Hilton, B.L. 1992. Reproduction in the Mexican vole, *Microtus mexicanus*. *Journal of Mammalogy* 73(3): 586-590.
- Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press and Arizona Fish and Game Department. 602 pp.
- Johnson, R.R., L.T. Haight, and J.M. Simpson. 1977. Endangered species versus endangered habitats: a concept. Pages 68-79 *in* R.R. Johnson and D.A. Jones, technical coordinators Importance, preservation, and management of riparian habitat: a symposium U.S. Department of Agriculture, Forest Service General Technical Report RM-43. 217 pp.
- LaRue, C.T. 1994. The birds of northern Black Mesa, Navajo County, Arizona. *The Great Basin Naturalist* 54: 1-63.
- LaRue, C. T., G. C. Bateman, and B. P. Dunfee. 1990. Population characteristics of small mammals on reclaimed surface-mined lands and native sagebrush shrubland. Pages 126-135 *in* The Proceedings of Managing Wildlife in the Southwest Symposium.
- Monson, G. and A.R. Phillips. 1981. Annotated checklist of the birds of Arizona, second edition. University of Arizona Press, Tucson, Arizona. 240 pp.

Peabody Western Coal Company. 1985. Mining and Reclamation Plan: Black Mesa and Kayenta Mines.

Peterson, R.T. 1990. A field guide to western birds. Houghton Mifflin Co. New York, NY. 432 pp.

Skaggs, R.W., D.H. Ellis, W.G. Hunt, T.H. Johnson. 1986. Peregrine falcon. Pages 127-136 in Glinski, R.L. et al. Eds. Southwest Raptor Management Symposium and Workshop. National Wildlife Federation Scientific and Technical Service No.11. 395 pp.

Smith, D.G., J.R. Murphy, and N.D. Woffindin. 1981. Relationships between jackrabbit abundance and ferruginous hawk reproduction. Condor 83: 52-56.

ATTACHMENT A: DRAWING 1

PROPOSED J-23 CORRIDORS, HABITAT, AND SURVEY STATIONS

ATTACHMENT 6

FINAL BIOLOGICAL REPORT: GENERAL BIOLOGICAL SURVEY OF THE
J9 PROJECT AREA AND NAVAJO ROUTE 41 REALIGNMENT
BLACK MESA MINE, BLACK MESA, ARIZONA

FINAL BIOLOGICAL REPORT:

**GENERAL BIOLOGICAL SURVEY OF THE J-9 PROJECT AREA
AND NAVAJO ROUTE 41 REALIGNMENT,
BLACK MESA MINE, BLACK MESA, ARIZONA.**

Submitted To

**Peabody Western Coal Company
Post Office Box 650, Navajo Route 41
Kayenta, Arizona 86033
(520) 677-5078**

Prepared By

**SWCA Inc.,
Environmental Consultants
114 North San Francisco Street
Flagstaff, Arizona 86001
(520) 774-5500**

30 October 2000

Contents

Introduction	1
Methods	1
Results	2
Discussion	3
Effects of drilling and mining operations on T&E/WC species	2
Effects of drilling and mining operations on other wildlife species	4
Conclusions	5
Literature Cited	5

List of Tables

Table 1. Status of T&E/WC species potentially found within the proposed project area.	2
Table 2. Wildlife species observed during survey of J-9 project area.	3

List of Attachments

Attachment A: Drawing 1. J-9 Proposed Exploration Plan: Phase 1 Survey Map.

Introduction

Peabody Western Coal Company (PWCC) has conducted baseline and ongoing wildlife monitoring studies in and surrounding the Black Mesa Complex leasehold since 1979 (PWCC 1985). To confirm the potential impacts of proposed exploration and mining activities in a future mining area, SWCA, Inc., Environmental Consultants (SWCA) was contracted by PWCC to conduct a supplemental biological survey (survey) of the J-9 project area and Navajo Route 41 re-alignment corridor. The new mining area will be part of the Black Mesa Mine, Black Mesa, Arizona. The survey was conducted to determine the habitat suitability for U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered (T&E) species, Arizona Game and Fish Department (AGFD) Wildlife Species of Concern (WC) and selected raptors. A species of interest survey and assessment of potential impacts due to proposed exploration and mining was completed during the spring of 2000. In addition to supplemental biological survey and habitat assessment of the project area, biologists conducted searches for active and inactive raptor nests to determine the potential impacts to breeding raptors.

The J-9 project area and re-alignment corridor for Navajo Route 41 (project area), comprises 802 acres of piñon-juniper and Great Basin sagebrush habitats. The dominant vegetation type found on the project area is Great Basin sagebrush shrubland, comprising 528 acres of habitat. Plants identified in this habitat type include basin big sagebrush (*Artemisia tridentata*), four-wing saltbush (*Atriplex canescens*), and rabbitbrush (*Chrysothamnus nauseosus*). Sparse ground cover exists and is dominated by snakeweed (*Gutierrezia sarothrae*), buckwheat (*Eriogonum* sp.), and rocketflower (*Ipomopsis* sp.). There are no areas of continuous sagebrush habitat and in many areas, the ground has been denuded of vegetation. The remaining 274 acres consist of piñon-juniper woodland characterized by sporadic one-seed juniper (*Juniperus monosperma*) and piñon pine (*Pinus edulis*) trees. None of the trees are taller than 20 feet and there is no well-defined canopy present.

Methods

To identify pertinent T&E/WC species potentially found on the proposed project area, SWCA compiled a list of T&E/WC species from the USFWS Threatened and Endangered Species Lists and AGFD's Heritage Data Management System (HDMS) based on habitat availability. The only T&E species likely to occur on the project area, included the bald eagle (*Haliaeetus leucocephalus*). Species listed as WC and potentially occurring on the project area included Navajo Mountain Mexican vole (*Microtus mexicanus navaho*), northern goshawk (*Accipiter gentilis*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and American peregrine falcon (*Falco peregrinus anatum*). The USFWS, AGFD, and other federal status for each species are listed in Table 1 (below).

Table 1. Status of T&E/WC species potentially found within the proposed project area.

Common Name	Scientific Name	AGFD Status	Federal Status
American bald eagle	<i>Haliaeetus leucocephalus</i>	WC	T/EPA/MBTA
golden eagle	<i>Aquila chrysaetos</i>	WC	MBTA/EPA
American peregrine falcon	<i>Falco peregrinus anatum</i>	WC	MBTA
Ferruginous hawk	<i>Buteo regalis</i>	WC	MBTA
Navajo Mountain Mexican vole	<i>Microtus mexicanus navaho</i>	WC	None
Northern goshawk	<i>Accipiter gentilis</i>	WC	MBTA
Cooper's hawk*	<i>Accipiter cooperii</i>	none	MBTA

MBTA refers to the Migratory Bird Act (16 USC §§ 703 et seq.) EPA refers to the Bald and Golden Eagle Protection Act (16 USC § 668a-668d).

* Although this species has no AGFD status, the species is monitored by PWCC and species specific surveys are normally conducted in conjunction with surveys for the northern goshawk in areas of potentially suitable habitat.

A field reconnaissance of the project area was conducted on 7-8 June 2000. During the field reconnaissance, a qualified SWCA biologist used pedestrian transects to assess the habitat found on the project area and determined the suitability of the habitat for nesting Cooper's hawks, northern goshawks, and other T&E/WC species. In addition to the habitat assessment, the biologist conducted an extensive search of trees present to identify active or inactive raptor nests. Other wildlife species including birds, mammals, and herpetofauna were documented during pedestrian transects.

Results

No T&E/WC species were observed during the reconnaissance of the project area or Navajo Route 41 alignment-corridor. Although species-specific surveys for listed T&E/WC species were not conducted, suitability of habitats for each species was noted. No raptor nests were observed during the survey and no suitable breeding habitat for any T&E/WC species was identified on the project area.

A number of other wildlife species were observed during the survey effort. Table 2 (below) lists other species of wildlife observed.

Table 2. Wildlife species observed during survey of J-9 project area.

Common Name	Scientific Name	Common Name	Scientific Name
piñon jay	<i>Gymnorhinus cyanocephalus</i>	gray flycatcher	<i>Empidonax wrightii</i>
Western scrub jay	<i>Aphelocoma californica</i>	Black-throated gray warbler	<i>Dendroica nigrescens</i>
western bluebird	<i>Siala mexicana</i>	Common raven	<i>Corvus corax</i>
juniper titmouse	<i>Baeolophus ridgwayi</i>	Black-tailed jackrabbit	<i>Lepus californicus</i>
common bushtit	<i>Psaltriparius minimus</i>	Sagebrush lizard	<i>Sceloporus graciosus</i>

Discussion

On Black Mesa, northern goshawks are common winter visitors and have been found nesting in mixed-conifer and dense piñon-juniper woodlands (LaRue 1994). Cooper's hawks have been found nesting in higher elevation piñon-juniper stands (where juniper appears to be selected as nest sites), and mixed-conifer woodland. The habitat of the project area consists of piñon-juniper woodlands with canopy heights ranging from <3 to 20 ft. One-seed juniper and a few piñon pine trees, having a maximum height of 20 feet, are present in the piñon-juniper woodland. The woodland habitat does not have the typical structure required for breeding Cooper's hawks and northern goshawks and should be considered unsuitable breeding habitat.

Minimal dense ground cover exists on the J-9 project area and the habitat is suitable for prey species such as black-tailed jackrabbits and rock squirrels. The lack of ground cover may be attributed to overgrazing, as signs of cattle grazing were evident throughout the project area. None of the T&E/WC species listed in Table 1, were observed during the survey. Exploratory drilling operations and subsequent mining of the project area will not impact breeding Cooper's hawks or northern goshawks on Black Mesa.

Effects of drilling and mining operations on T&E/WC species

Although bald eagles are known to occur on Black Mesa during the winter months, this species is most common around the numerous water impoundments found on the mine reclaim areas of the Black Mesa and Kayenta Mines (LaRue 1994). Bald eagles have not been documented breeding on Black Mesa. This species will not be affected by drilling or mining activities on the project area.

While foraging habitat for golden eagles exists there is no suitable nesting habitat for this species. Golden eagles are known to migrate through the area and have been known to nest on the eastern edge

of Black Mesa approximately ten miles from the project area (LaRue 1994). Drilling and subsequent mining in the project area will have no impact on nesting habitat for this species.

Human activities near the nest site and destruction of habitat for prey species can affect nesting peregrines (Ellis 1982). Destruction of prey habitat, including wetland areas and other areas with large numbers of migratory waterfowl, can cause nest failure due to the lack of adequate prey during the breeding season. Nesting habitat for the American peregrine falcon is known from the east edge of Black Mesa, but there is no nesting habitat on the proposed project area. Since there is no wetland habitat that may attract migratory waterfowl in the proposed project area, expansion in this area will not impact foraging habitat. Mine activity in the project area will not impact peregrine falcons.

Nesting and foraging habitat occurs on the project area for the ferruginous hawk. This species is uncommon in northern Arizona and has been found wintering over Black Mesa; no breeding records have been identified to date and the status of this species on Black Mesa is unknown. Mine activities in the project area should have no impacts on the population of this species.

The Navajo Mountain Mexican vole is known from locations on, and surrounding, PWCC's Black Mesa and Kayenta mines. On Black Mesa, available habitat for Mexican voles includes: large, continuous stands of basin big sagebrush, grassy bottoms of the many large canyons that bisect northern Black Mesa, the edges of water impoundments found on mine reclamation areas, several closed basins on mine reclamation areas, and the riparian corridors found on the southern portions of the Black Mesa monocline. It has also been found in dense stands of basin big sagebrush (LaRue et al. 1990). Similar stands of basin big sagebrush do not occur on the project area and mining activities within the project area should not impact populations of Navajo Mountain Mexican vole.

Effects of drilling and mining operations on other wildlife species

The proposed drilling activities will have minimal impacts on other wildlife species. Subsequent mining activities will impact nesting habitats of bird species occurring on the project area by removing nesting habitat. However, the area surrounding the project area consists of similar piñon-juniper and Great Basin sagebrush desert and impacts to species found in this habitat will not be significant. Resident species which utilize piñon-juniper and Great Basin desert habitats may be permanently displaced, but given the area of similar habitats surrounding the project area, mining activities should have little impacts on the populations of these species. Grassland species including horned larks (*Eremophila alpestris*) and vesper sparrows (*Pooecetes gramineus*) may be favorably impacted by mine reclamation activities as the subsequent reclamation of the mine land will provide habitat not currently present on

the J-9 project area.

Conclusions

Expansion of mining activities into the J-9 project area should have no impacts on listed T&E/WC species, or Cooper's hawks. The area is now used mainly for livestock grazing and no listed species are known to occur within the boundaries of the proposed mine expansion area. Although other wildlife species would be displaced or potentially lost, the expansion will not affect these species viability on Black Mesa. Although foraging habitat for listed avian species is present, the alteration of the 511 acres of piñon-juniper and Great Basin desert should have little, if any, adverse, long-term impacts on these listed species. Ultimately, reclamation of the mine area following mining activities may provide for additional habitats not currently present in the J-9 project area.

Literature Cited

- Ellis, P.H. 1982. The peregrine falcon in Arizona: Habitat utilization and management recommendations. Institute for Raptor Studies, research report No.1. Oracle, Arizona. 24 pp.
- LaRue, C.T. 1994. The birds of northern Black Mesa, Navajo County, Arizona. *The Great Basin Naturalist*. 54: 1-63.
- LaRue, C. T., G. C. Bateman, and B. P. Dunfee. 1990. Population characteristics of small mammals on reclaimed surface-mined lands and native sagebrush shrubland. Pp 126-135. *in* The Proceedings of Managing Wildlife in the Southwest Symposium.
- Peabody Western Coal Company. 1985. Mining and Reclamation Plan: Black Mesa and Kayenta Mines.

ATTACHMENT A: DRAWING 1.

J-9 PROPOSED EXPLORATION PLAN: PHASE 1 SURVEY MAP.