FINAL REPORT:

Habitat Mapping and Assessment for the J-23 Coal Extension Area, Kayenta Mine, Black Mesa, Arizona

Submitted to:

Peabody Western Coal Company

Submitted by:

SWCA, Inc.,
Environmental Consultants

28 September 2000

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Submitted to:

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28 September 2000

Introduction

To determine the impacts exploratory drilling may have on nesting northern goshawks (*Accipiter gentilis*) and Cooper's hawks (*Accipiter cooperii*), PWCC contracted SWCA, Inc., Environmental Consultants (SWCA) to conduct a habitat assessment of the J-23 mine extension area. This habitat assessment consisted of mapping the various habitats on orthophoto maps and subsequently conducting a ground reconnaissance to assess the accuracy of habitat polygons. Using this information, an assessment of the habitat suitability for northern goshawks and Cooper's hawks and a timing schedule for drilling operations can be developed that would reduce or eliminate impacts to breeding raptors within the extension area.

The J-23 extension area encompasses approximately 1,300 acres of pinyon-juniper woodland and sagebrush shrubland. Elevations range from 6,700 to 7,000 feet above mean sea level (msl). Plants found in this community include one-seed juniper (*Juniperus monosperma*), pinyon pine (*Pinus edulis*), basin big sagebrush (*Artemisia tridentada*), cliffrose (*Purshia mexicana*), and snakeweed (*Gutierrizia sarothrae*). The topographic relief of the extension area is generally rolling hills, with few steep areas of topography. No cliff habitat exists on the extension area and nesting habitat for raptors is limited to small areas of large (20+ feet) one-seed juniper and pinyon pine trees.

Northern Goshawk

Northern goshawks have a broad, holarctic distribution. In North America they breed in western Alaska, most of Canada, along the Pacific Coast to central California, forested eastern states as far south as West Virginia, throughout the Rocky Mountain region south through Arizona and New Mexico and into Mexico in mountainous regions (Reynolds et al. 1992). Goshawks winter throughout their breeding range south through southern California, northern Mexico and Texas. They may experience occasional migrational eruptions southward during severe winters (Scott 1987).

In North America, goshawk nest sites are in large forest stands characterized by a sparse understory which allows for foraging, greater than 50% canopy cover for nest protection (Johnsgard 1990), and areas with gentle or moderate slope (Hall 1984). Goshawks are most frequently found in coniferous forests and in the Southwest typically select pine forests with fairly open, park-like understories.

Nest sites are usually in large, old trees with moderate canopy closure providing shelter. Goshawks usually maintain one or more extra nest sites including nests from previous years and may exhibit nest site fidelity (AGFD 1993).

An important aspect of goshawk habitat is a fairly large area in the vicinity of the nest, containing a mosaic of habitat types and an abundance of prey species. This area, known as the Post Fledgling Area (PFA) (Reynolds et al. 1992), is important for fledglings learning how to hunt and hide from predators. Large, diverse areas also provide young birds with more varied experiences in a variety of habitat types.

Northern goshawks prey on a wide variety of small to mid-sized mammalian and avian species such as tree squirrels (*Sciurus* spp. and *Tamiasciurus* spp.), blue grouse (*Dendragapus obscurus*), cottontail rabbits (*Sylvilagus* spp.), woodrats (*Neotoma* spp.), band-tailed pigeons (*Columba fasciata*), doves (*Zenaida* spp.), jays (Family: Corvidae), and woodpeckers (*Picoides* spp.) (Ehrlich et al. 1988).

The northern goshawk was formerly given C2 status by the US Fish and Wildlife Service (USFWS), is a US Forest Service (USFS) Sensitive species, and is an Arizona Game and Fish Department (AGFD) Wildlife Species of Concern.

Cooper's Hawk

The Cooper's hawk is thought to be a fairly common permanent resident and migrant species in the Black Mesa area (LaRue 1994), preferring habitats at elevations greater than 5,000 feet msl. This hawk typically nests in the upper half of tall coniferous trees. Studies on Black Mesa indicate that they nest in mixed-conifer forests and pinyon/juniper habitats (PWCC 1996). Cooper's hawk nests are often associated with water sources (e.g. cattle tanks or springs), but it is uncertain if the presence of surface water is a necessary condition for nesting. Nesting Cooper's hawks frequent pools, streams, and cattle tanks to drink, and have not been found nesting in regions totally devoid of surface water (Glinski 1998). The Cooper's hawk feeds on birds and small mammals (Beilefeldt et al. 1992). The Cooper's hawk is not listed as threatened, endangered, or sensitive by the USFWS, USFS, or the AGFD.

Habitat Assessment

Habitat Mapping

An SWCA biologist delineated habitat polygons on an orthophoto map provided by PWCC (Attachment A). The density of trees was used during this initial estimate of habitat suitability. Habitat polygons were drawn around areas of highest tree density, moderate tree density, and low to no tree coverage. These polygons were then labeled as suitable nesting habitat, marginal nesting habitat, and unsuitable nesting habitat.

Ground Reconnaissance

On 25 September 2000, a biologist conducted a ground reconnaissance and field check of these habitat polygons. Using the drafted copy of the J-23 extension area map which depicts the

polygons, the biologist determined the suitability of the habitat to sustain nesting raptors. The biologist examined the habitat found within each of the pre-determined polygons to assess actual height of canopy and ground cover present. Major drainages and canyons were examined to determine the size and density of trees contained within. After examining each of the polygons, the extent of each polygon was adjusted to incorporate habitat data that was gathered during the ground reconnaissance.

Results and Discussion

Habitat classified as "suitable" consisted of pinyon-juniper woodland with an average canopy height of 18-25 feet and line-of-site distances of about 50 feet. Many of the trees within areas classified as "suitable" were large and capable of sustaining breeding raptors and the remaining trees provided adequate cover for birds and small mammals. Few trees within the J-23 extension area were greater than 30 feet in height. Habitat classified as "marginal" had canopy heights of between 15 and 25 feet and were typically more open, with line-of-site distances of around 75-100 feet or more. Areas classified as "unsuitable" were large openings dominated by basin big sagebrush with sporadic pinyon and one-seed juniper trees invading. None of these trees were taller than 10-15 feet and the canopy remained open throughout. Of the 1,300 acres that encompass the J-23 extension area, there is a total of approximately 343 acres of suitable habitat, 738 acres of marginally suitable habitat, and 150 acres of unsuitable habitat. No nest structures were identified during the field reconnaissance and no raptors were seen on the J-23 extension area.

The breeding season for these two species typically begins in late April through early May, and continues until early to mid-July. Drilling prior to the breeding season should have minimal impacts on raptors potentially nesting within the extension area. If PWCC decides to conduct drilling outside the breeding season, SWCA recommends that the drilling efforts focus on areas of suitable habitat first, leaving the marginally suitable and unsuitable habitat to be drilled at a later date. To avoid disturbing potentially suitable nesting habitat, the felling of large trees should be avoided when possible. Should PWCC consider drilling within suitable or marginally suitable habitat during the breeding season, SWCA recommends performing a formal survey for raptors within the areas delineated prior to commencing drilling activities.

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ATTACHMENT A

J-23 HABITAT POLYGONS

J23 HABITAT SUITABILITY

Map By:	CAS	*Plot Date:*	Tuesday October 03, 2000
Scale:	1 Inch = 500 Feet	*Flight Date:*	May, 1997
Contour Interval:	N/A	*Image Resolution:*	2 Feet

- marginal
- suitable
- unsuitable

300 0 300 600 Feet

nil .

PEABODY WESTERN