

Appendix 16.C

Threatened and Endangered Species Surveys

April 2008

Information regarding the locations and populations of threatened, endangered, and sensitive species has been redacted from this appendix to protect the confidentiality of this information.

Threatened and Endangered Species Surveys

Navajo Mine Extension Project

Prepared for:

**BHP Navajo Coal Company
Navajo Mine Extension Project
Fruitland, New Mexico**

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ECOSPHERE ENVIRONMENTAL SERVICES

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1.0 Introduction

Ecosphere Environmental Services (Ecosphere) was contracted by BHP Navajo Coal Company (BNCC) to conduct threatened and endangered species surveys for the Navajo Mine Extension Project (NMEP). The NMEP comprises Areas 4 South and 5 of BNCC's existing coal lease. The purpose of this survey was to adhere to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Navajo Nation code requirement for species of concern (17NNC507) administered by the Navajo Natural Heritage Program (NNHP) of the Navajo Nation Department of Fish and Wildlife (NNDFW), and the Surface Mining Control and Reclamation Act of 1977 (SMCRA) (30 CFR 780.16).

This report outlines the data collections and methodologies implemented for inventorying the project area. The methodologies used are consistent with U.S. Fish and Wildlife Service (USFWS) and NNDFW guidelines and requirements; the study plan was approved by Office of Surface Mining Reclamation and Enforcement and NNDFW on May 29, 2007 and June 21, 2007, respectively.

2.0 Project Area

2.1 Location

The NMEP is located about 20 miles (linear distance) southwest of Farmington, New Mexico and is found on the Hogback S, Newcomb NE, and The Pillar NW, New Mexico 7.5-minute U.S. Geological Survey (USGS) quadrangles (Figures 1 and 2 in Attachment B). The NMEP permit area comprises 13,006 acres in BNCC lease Areas 4 South and 5.

2.2 Physical Description

The project area is located within the Colorado Plateau province, on the west edge of the San Juan Basin. Topography in the area includes flats and tablelands with moderate to considerable relief associated with incised washes and canyons. The project area is within the Chaco Wash watershed with shallow soils, steep hills, and rock

outcrops. Although this area is intersected by Pinabete and No Name arroyos, the drainages are dry much of the summer. The only standing surface water present within the boundaries of the project area is found in three stock ponds scattered throughout the project area. Most precipitation in the area occurs from July through October in localized, short-duration, high-intensity thunderstorms.

2.3 Vegetation

The project area is comprised of Great Basin desert-scrub habitat (Dick-Peddie 1993). Great Basin desert-scrub habitat is a cold desert ecosystem dominated by a variety of shrubs with a sparse under story of forbs and grasses, with bare ground dominating in poor, alkaline soils (Fitzgerald et al. 1994, Dick-Peddie 1993). Although many of the more than 160 plant species that were identified in this area are present in two or more plant communities (Ecosphere 2004*a, b* and 2008), each vegetation community type contains a few distinguishing or unique plant species. The following brief descriptions list a few of those distinguishing or unique plant species, which typically define the vegetation community. These six vegetation communities are listed below.

2.3.1 Dunes

The deep sands found in dune communities allow for more consistent water availability. Since only deep-rooted perennial plants can exploit this deep water, the dunes have several unique plant species including San Juan milkweed (*Asclepias sanjuanensis*). Other common species include cryptantha (*Cryptantha crassisejala*), tansy mustard (*Descurania pinnata*), twinpod (*Dimorphocarpa wislizeni*), globemallow (*Sphaeralcea parvifolia*), Indian ricegrass (*Achnatherum hymenoides*), galleta grass (*Pleuraphis jamesii*), and evening primrose (*Oenothera pallida*).

2.3.2 Sands

As with dunes, the deeper penetration of rainwater into sandy soil allows for greater water availability and increases plant species diversity. The types of sand in this habitat can vary from saline to calcareous. This sands habitat often transitions to and can

be mixed with thin breaks habitat. In years with high amounts of spring rainfall sandy soils display an abundance of annuals, especially of scorpion weed (*Phacelia crenulata*), annual Townsend daisy (*Townsendia annua*), and cryptantha. Other common species include Russian thistle (*Salsola tragus*), pincushion (*Chaenactis stevioides*), galleta grass, and wire lettuce (*Stephanomeria exigua*).

2.3.3 Arroyo Shrub

Arroyo shrub habitat is most commonly found in major drainages and washes, such as Pinabete and No Name arroyos. Shrubs and perennials characteristic of this habitat include greasewood (*Sarcobatus vermiculatus*), Russian thistle, tansy mustard, alkali sacaton (*Sporobolus airoides*), four-winged saltbush (*Atriplex canescens*), cryptantha, greasewood (*Sarcobatus vermiculatus*), and snakeweed (*Gutierrezia sarothrae*).

2.3.4 Alkali Wash

Alkali wash is vegetation habitat associated with minor waterways. These areas are typically broad and level with occasional small, dense patches of galleta grass and alkali sacaton. Alkali wash range sites are typically located in washes and drainages as well as at the base of Badlands. Terrain is nearly level to moderately sloping, ranging from 0 to 3%. Other plants that are locally common in alkali wash include tansy mustard, Russian thistle, scorpion weed, mound saltbush (*Atriplex obovata*), alkali sacaton, galleta grass, woolly plantain (*Plantago patagonica*), and annual Townsend daisy.

2.3.5 Thin Breaks

Thin Breaks is characteristic of rocky areas with loose rock, occasionally with large pieces of rock, usually shale, that are firmly embedded in the ground. Thin breaks are typically upland habitats with surface rock as a unifying feature. Flat, surface rocks allow for greater water to run off and accumulate in crevices or fissures between rocks. Thin break plant species that occur in these fissures include Russian thistle, tansy mustard, cryptantha, shadscale saltbush (*Atriplex confertifolia*), alkali sacaton, stickseed (*Lappula occidentalis*), dwarf gilia (*Ipomopsis pumila*), and scorpion weed.

2.3.6 Badlands

Badlands have the least vegetation of any habitat type in the project area. Among the more common plants along the small relief channels of these barren areas are Powell's saltbush (*Atriplex powelli* var. *powelli*), mound saltbush, annual Townsend daisy, stickseed, woolly plantain, salty buckwheat (*Stenogonum salsuginosum*), Gordon's buckwheat (*Eriogonum gordonii*), scorpion weed, and globemallow.

3.0 Threatened, Endangered, and Sensitive (TES) Flora

Prior to conducting fieldwork, Ecosphere biologists compiled a list of threatened, endangered, and sensitive (TES) species listed by the USFWS and NNHP. Federally listed species were obtained from the USFWS Southwest Region endangered species list (USFWS 2007). The flora species currently identified by the USFWS and the NNHP that have the potential to occur in the project area are presented in Table 1 (refer to Attachment A).

Ecosphere consulted with NNHP regarding the presence of "species of concern" in the proposed project area (Attachment C). NNHP species of concern include protected, candidate, and other rare or otherwise sensitive species. The species listed by the NNHP are mapped quadrangle-specific rather than project-site specific. The potential for species occurrence was determined on quadrangle-wide coarse habitat characteristics and species information provided by NNHP. The consultation with NNHP currently indicated there were no known flora species of concern occurring within or near the proposed project area. San Juan milkweed, a NNHP species of concern, was not listed as a species with the potential to occur in the project area. However, occurrences of San Juan milkweed and suitable habitat were observed during surveys; therefore, it is included in Table 1 and discussed in further detail below.

3.1 Methods

Surveys for TES flora were conducted in Areas 4 South and 5 in 2007 using USFWS and NNDFW species-specific guidelines and in accordance with accepted scientific standards or guidelines. Previous TES surveys conducted in the BNCC mine

lease area were reviewed; we evaluated the methods used and species detected (namely, TRC Mariah 1999) to develop our study plan for efficient and thorough survey strategies.

TES flora survey methods began with examination of the potential for species to occur in the project area based on known habitat associations and agency consultation. Potential habitat in the project area was evaluated and delineated using a combination of vegetation community types and soil survey map unit descriptions. All habitats were ground truthed and observed using high-powered binoculars (8 x 42, 6.3°, Pentax, Asahi Optical Company, Japan). Field surveys were conducted May 9 to 14, 2007. Unique habitat or potential habitat was surveyed for sensitive flora presence/absence using teams consisting of two qualified botanists walking parallel transects, about 20 ft apart during the spring, the optimal survey season for most species. When TES flora species were found, their locations were digitally recorded with a handheld Garmin® GPS unit (Garmin International, Inc., Olathe, KS). Occupied habitat, and potential but unoccupied habitat, was delineated and mapped (Figure 3 in Attachment B).

3.2 Survey Results

The project area does not contain potential habitat for any of the three federally listed threatened or endangered flora species (Table 1 in Attachment A), nor were any of these federally listed species observed in the project area. None of these species have been previously documented as occurring within the project area (OSM Permit No. NM-0003F).

3.2.1 San Juan milkweed

This species was encountered at six widely dispersed locations in the project area (Figure 3 in Attachment B). Several individual milkweed plants were encountered at each of these locations. The stems of this perennial milkweed grow from a woody taproot and are 4 to 8 centimeters (cm) tall. Stems are typically prostrate with leaves 2 to 4 cm long. Diagnostic characteristics of this milkweed are the white, tomentulose leaf margins, and a terminal inflorescence with reddish-violet flowers. This milkweed flowers in April and has mature fruits in mid to late May. The characteristic habitat of

this plant is sandy soil, sometimes occurring in piñon-juniper woodlands. In the project area, this species occurs in the dunes vegetation community (Figure 3 in Attachment B).

There are no federal, state, or Navajo Nation protections for this species. The Navajo Nation does not currently have sufficient information to support this species being listed as threatened or endangered on the Navajo Endangered Species List (NESL).

4.0 TES Fauna

Prior to conducting fieldwork, Ecosphere biologists compiled a list of federal and Navajo Nation listed species and evaluated their habitat requirements to determine their potential to occur in the project area. Federally listed species were obtained from the USFWS Southwest Region endangered species list (USFWS 2008). The Navajo Nation listed species were obtained through NNHP consultation. We conducted species-specific surveys to determine presence or absence of the following target species: banner-tailed kangaroo rat (*Dipodomys spectabilis*), kit fox (*Vulpes macrotis*), mountain plover (*Charadrius montanus*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia hypogaea*), black-footed ferret (*Mustela nigripes*), and pronghorn antelope (*Antilocapra americana*). All of these species are listed as either threatened or endangered by the USFWS, or as a species of concern by the Navajo Nation (Table 1).

4.1 Methods

We conducted surveys in coordination with NNHP species-specific guidelines (Mikesic et al. 2005), USFWS protocols, and accepted scientific standards. We utilized our knowledge of the area, biological expertise, and experience with the survey methods for these target species.

4.1.1 Ferruginous hawk

We completed ferruginous hawk surveys by focusing on habitat use and breeding/occupancy following three successive steps: 1) identifying potential habitat by analyzing USGS topographic maps and aerial photographs of Area 4 South and 5, plus a 1-mile buffer, 2) consulting with David Mikesic, NNDFW biologist, to identify known or

historic territories, 4) reviewing results of 2005 raptor surveys in Area 5 (Ecosphere, unpublished data), and 3) conducting field surveys in spring for nests or breeding individuals utilizing high-powered binoculars and spotting scopes to minimize disturbance. No official (USFWS or NNDFW endorsed) survey protocol exists for this species.

4.1.2 Golden eagle

Our survey methodology for golden eagle was similar to that for ferruginous hawk except for the timing of field surveys. Surveys were conducted for golden eagle in March since courtship, breeding, and nesting are typically initiated in mid to late February. Previous surveys identified a historic golden eagle nest located approximately 1-mile outside the lease boundary for Area 4 South, which was visited in February of 2007 for other work on the BNCC mine lease area related to water well and test drilling.

4.1.3 Burrowing owl

Burrowing owls typically use burrows made by fossorial mammals, namely prairie dogs, but also ground squirrels or badgers (Henny and Blus 1981). Therefore, we conducted surveys for burrowing owl in conjunction with mapping and describing prairie dog towns within the project area and recorded observations during vegetation and mountain plover surveys. We conducted surveys in pairs by walking parallel 100-ft transects with high-powered binoculars through areas where burrowing owls had been previously documented (Ecosphere 2004a). We identified several burrowing owls within a prairie dog town in Area 5. Consequently, we revisited the area and delineated the area containing burrows for burrowing owls. We recorded the boundaries with a Trimble® TDC1 Global Positioning System (GPS) datalogger (Trimble Navigation Limited, Sunnyvale, CA) and hand-held units from the Trimble® GeoExplorer® 2005 series and mapped the area using ArcGIS [Environmental Systems Research Institute, Inc. (ESRI), Redlands, California].

4.1.4 Mountain plover

We conducted 2007 surveys in all suitable habitats in Areas 4 South and 5 following the methodology developed by Delbert et al. (1999) for the USFWS. Per the

guidelines of the USFWS, we conducted three field surveys on May 9, May 30, and June 14, 2007 between local sunrise and 1000 or between 1730 and local sunset. We utilized roads wherever possible, stopping every few hundred meters to scan the landscape with binoculars for mountain plovers. While pedestrian surveys are not generally recommended because plovers usually flush at greater distances when approached on foot, some areas of suitable habitat in the project area could not be accessed by vehicle. We recorded all mountain plover detections using coordinates recorded in the field with a Garmin® handheld GPS unit (Garmin International, Inc., Olathe, KS).

4.1.5 Black-footed ferret

The presence of black-footed ferrets is dependent upon prairie dogs, their primary prey. Large, active prairie dog towns >198 acres (80 hectares) with ≥ 8 burrows/acre (≥ 20 burrows/ha) are required to support black-footed ferrets. Alternatively, multiple towns within 7-kilometers (km) of each other may comprise the minimum acreage and burrow density to support black-footed ferrets (USFWS 1988). Therefore, we surveyed for black-footed ferrets by mapping active prairie dog towns. Prairie dogs are known to occur in Areas 4 South and 5 (Ecosphere 2004a). We conducted preliminary surveys of prairie dog towns in spring when prairie dogs emerge from hibernation and observed several prairie dog towns on several occasions in late spring and early fall 2007. All prairie dogs observed in the project area were Gunnison's prairie dogs (*Cynomys gunnisoni*). In October and November of 2007, we mapped the boundaries of these towns, using a handheld Trimble GeoXT™ GPS unit and calculated the approximate burrow densities for individual towns. We enumerated number of burrows within two prairie dog towns to estimate burrow/ha.

In July and August 2008, we conducted nocturnal surveys for black-footed ferrets (see 2008 Black-footed Ferret Survey Report - Attachment C). We chose to conduct nocturnal surveys rather than diurnal surveys because the former method is designed to observe ferrets when their population is greatest (1 July - 31 October) and activity levels are highest, resulting in better detection of any possible remnant black-footed ferret population occurring in the NMEP area. We conducted surveys following USFWS and

NNDFW protocols (USFWS 1988, NNDFW 1985) for nocturnal surveys (see 2008 Black-footed Ferret Survey Report - Attachment C).

4.1.6 Banner-tailed kangaroo rat

The presence of banner-tailed kangaroo rats is distinguishable by identifying large mounds typically with 3 to 12 burrow openings on a raised mound ≤ 1.2 meters tall and 1.5 to 4.5 meters in diameter in sandy, desert scrub or desert grassland habitats (Mikesic et al. 2005). We visited and evaluated all previously documented mounds and any new mounds observed during 2007 vegetations surveys $< 1,500$ feet of an existing 2-track road. We looked for any fresh digging, scat, or tracks surrounding the burrow openings and we manually patted the mounds to solicit territorial thumping, which has been utilized to determine if mounds are occupied (J. Zahratka, personal experience). We also recorded the location of the mounds using a handheld Trimble GeoXT™ GPS unit and mapped each mound (Figure 4 in Attachment B). We randomly visited 18 potential banner-tailed kangaroo rat mounds to ground-truth each mound and determine their status (i.e. active or inactive). We visited mounds until we found four active mounds less than 1,500-feet from an existing two-track road and out of sight from residences. In fall 2007, we set 20 to 50 live traps ($8 \times 9 \times 23$ cm; H.B. Sherman Trap Company, Tallahassee, FL) at the four mounds and trapped for two consecutive nights in and around each mound to document presence of banner-tailed kangaroo rats.

4.1.7 Kit fox

Four biologists spotlighted at night in pairs in separate vehicles by driving slowly on passable roads throughout Areas 4 South and 5 (Figure 5 in Attachment B) for two consecutive nights. While one biologist operated the vehicle, the other scanned the horizon with a two million-candlepower spotlight (The Brinkmann Corporation and Dallas Manufacturing Company, Inc, Dallas, Texas) to scan for green eye-shine. Predator calls (Primos® Hunting Calls, Flora, Missouri) were used during each spotlighting session to attract canids in the area, which could then be identified with spotlights. We spotlighted for two to four hours after midnight and repeated surveys on four occasions in 2007. The surveys occurred on the evenings of April 9 to 10 when females and pups are most likely near a den. The second event happened June 6 to 7

when pups begin foraging with adults. The last two events occurred on July 2 to 3 and August 29 to 30 as pups become more mobile and independent from adults (Fitzgerald et al. 1994). We did not survey along the roads in the west-central portion of Area 5 due to their proximity to a residence.

4.1.8 Pronghorn antelope

According to NNHP, pronghorn antelope are not known to occur in the project area (Mikesic et al. 2005). Therefore, we did not conduct formal surveys for pronghorn; rather, we surveyed for pronghorn concurrently with vegetation and wildlife surveys in spring, summer, and fall. We used high-powered optics to identify distinguishing physical characteristics of pronghorn antelope and their sign.

4.2 Survey Results

Of the eight fauna species listed on the NESL and by the USFWS, seven were documented in the project area.

4.2.1 Ferruginous hawk

Historic information and results of 2007 surveys for ferruginous hawk and their nests within 1 mile of the Area 4 South and 5 lease boundaries are outlined in Table 2 and displayed in Figure 6.

4.2.2 Golden eagle

Historic information and results of surveys for 2007 golden eagle and their nests within 1 mile of the Area 4 South and 5 lease boundaries are outlined in Table 3 and displayed in Figure 6 in Attachment B.

4.2.3 Burrowing owl

We conducted raptor surveys in the spring when migratory burrowing owls had not yet arrived on their breeding grounds. However, burrowing owls were observed on separate occasions during vegetation surveys in June 2007 and mountain plover surveys in June 2007 (Table 4 in Attachment A; Figure 7 in Attachment B). Burrowing owls were also observed in July 2007 during a prairie dog burrow inventory (Table 4 in Attachment A; Figure 7 in Attachment B).

4.2.4 Mountain plover

We observed mountain plovers on May 9, 2007, during the first of three USFWS protocol surveys for mountain plovers; no birds were detected at this same location during the second and third surveys (Table 5 in Attachment A; Figure 8 in Attachment B). However, mountain plovers were also observed in this general area during vegetation surveys on May 25, 2007. No other mountain plovers were detected during the other surveys on May 30 and June 14, 2007.

Mountain plovers were incidentally observed during breeding bird surveys (Ecosphere 2008) on May 18, 2007 (Table 5 in Attachment A; Figure 8 in Attachment B). This site was not surveyed during the first mountain plover survey, because it is not observable from a road. However, it was surveyed on foot during the second and third surveys; no birds were detected at this site during the second and third mountain plover surveys.

4.2.5 Black-footed ferret

We documented five major prairie dog towns in Areas 4 South and 5 of the NMEP (Table 6 in Attachment A; Figure 7 in Attachment B). Prairie dog town E was large enough to warrant black-footed ferret surveys, as well as C and D combined as they are adjacent towns that together provide a large enough prey base for black-footed ferrets. Further, all five towns are within 4.2 miles of each other to comprise the minimum acreage to support black-footed ferrets (USFWS 1988). We also counted 384 prairie dog burrows on town B for a density of five burrows per acre and 399 prairie dog burrows on town C for the same density of five burrows per acre (Table 6 in Attachment A). Although these burrow densities are slightly less than required by the USFWS for black-footed ferret surveys (eight burrows per acre), they are typical for this species. The burrow density recommended by the USFWS is specific to white-tailed prairie dogs (*Cynomys leucurus*) and black-tailed prairie dog (*Cynomys ludovicianus*), both of which usually occur in greater densities than Gunnison's prairie dogs (Hoogland 2006). Further, these estimates are approximate and likely underestimate the total density of burrows due to our cursory methods; future efforts should employ standard transects for counting burrows as suggested by Biggins et al. (1993).

The results of our nocturnal spotlighting surveys conducted for black-footed ferrets in July and August 2008 were negative, i.e. we detected no black-footed ferrets or their sign (see 2008 Black-footed Ferret Survey Report - Attachment C). Additionally, we identified all green eye-shine observed in the project area to either kit fox, coyote, black-tailed jackrabbit, or desert cottontail.

4.2.6 Banner-tailed kangaroo rats

We mapped banner-tailed kangaroo rat mounds compiled from incidental observations made during vegetation surveys and previously known locations (Ecosphere 2004a; Table 7 in Attachment A; Figure 4 in Attachment B). Four of these burrows exceeded our criterion of being <1,500 ft from a road so we did not visit them (see Section 4.1.6). Of the 14 mounds we visited, one was likely a complex of Ord's kangaroo rat (*Dipodomys ordii*) burrows, two mounds were not found, and two mounds appeared inactive, i.e. no scat, tracks, or runways were observed and the mound was in poor structural condition (Table 7 in Attachment A). Of the nine active banner-tailed kangaroo rat mounds, five were too close to residences and we were advised to avoid trapping at those mounds (Collette Brown, BNCC, pers. comm.). Therefore, we trapped at four mounds. We captured banner-tailed kangaroo rats at two of the mounds, as well as two ground squirrels (*Spermophilus* spp.) at one mound (Table 7 in Attachment A).

Capture success was low for banner-tailed kangaroo rats relative to previous trapping efforts in Area 5 (Ecosphere, unpublished data). This may be due to the timing of surveys. Previous surveys in Area 5 were conducted in late summer, whereas we trapped for banner-tailed kangaroo rats in 2007 in October and November when banner-tailed kangaroo rats are less active. Because suitable habitat for banner-tailed kangaroo rats exists throughout the project area, it is likely more banner-tailed kangaroo rat mounds exist in the project area than those we randomly visited.

4.2.7 Kit fox

We observed kit fox on all five spotlighting occasions in April, May, June, July, and August 2007. We also documented two kit fox dens (Table 8 in Attachment A; Figure 5 in Attachment B). Green eyeshine, indicative of canids, was also documented during multiple spotlighting surveys.

4.2.8 Pronghorn antelope

No pronghorn antelope or sign thereof were observed in the project area.

5.0 Conclusions and Recommendations

We observed six of the eight fauna species we surveyed for in the project area: ferruginous hawk, golden eagle, burrowing owl, mountain plover, banner-tailed kangaroo rat, and kit fox, as well as potential habitat for a seventh species, the federally endangered black-footed ferret. Because we documented sufficient prairie dog towns to support black-footed ferrets, we conducted nocturnal surveys for black-footed ferrets. We did not observe any black-footed ferrets or their sign during our survey efforts. Similarly, in the last three years of conducting spotlighting surveys in the NMEP area, we also have not detected any black-footed ferrets or observed their sign. Further, black-footed ferrets are considered extirpated from New Mexico (Jim Stuart, Conservation Biologist, New Mexico Department of Game and Fish, pers. comm.). Therefore, based on the survey effort and familiarity with the project site, Ecosphere concludes that no black-footed ferrets occur in the NMEP area. General mitigation measures are provided by NNHP (Mikesic et al. 2005) for all other species. Further surveys and monitoring may be required pending recommendations from NNHP.

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Attachment A: Tables

Tables containing threatened, endangered or sensitive species information have been removed to protect the confidentiality of this information.

Table 1. U.S. Fish and Wildlife Service (USFWS) and Navajo Nation Natural Heritage (NNHP) listed species with the potential to occur in the project area.

SPECIES	STATUS	HABITAT DESCRIPTION
Mammals		
Black-footed Ferret (<i>Mustela nigripes</i>)	Federally Endangered NESL Group 2	Open grasslands with year-round prairie dog colonies.
Pronghorn (<i>Antilocapra americana</i>)	NESL Group 3	Grasslands or desert-scrub with rolling or dissected hills or small mesas.
Banner-tail kangaroo rat (<i>Dipodomys spectabilis</i>)	NESL Group 4	Great Basin desert grassland or desert scrub. Presence of grasses is necessary.
Chisel-tooth kangaroo rat (<i>Dipodomys microps</i>)	NESL Group 4	Open, sandy areas in desert scrub habitat with rock or gravel; sensitive to grazing
Kit fox (<i>Vulpes macrotis</i>)	NESL Group 4	Desert scrub or desert grassland with soft, alluvial or silty-clay soils, with sparse vegetation cover.
Birds		
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	Federally Threatened	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Federal Candidate	Breeds in riparian woodlands with dense, understory vegetation.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	Federally Endangered	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.
Mountain plover (<i>Charadrius montanus</i>)	NESL Group 3	Breeds in short sparse vegetation in disturbed-prairies or semideserts with less than a 2-degree slope.
Golden eagle (<i>Aquila chrysaetos</i>)	NESL Group 3	Open habitats in mountainous, canyon terrain. Nests primarily on steep cliffs and occasionally large trees.
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	NESL Group 4	Nests in ground burrows (often deserted prairie dog burrows) in dry open grasslands or desert scrub.
Ferruginous hawk (<i>Buteo regalis</i>)	NESL Group 3	Nests in badlands, flat or rolling grasslands and desert scrub.
Fish		
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	Federally Endangered	Large rivers with strong currents, deep pools, and quiet backwaters.
Razorback Sucker (<i>Xyrauchen texanus</i>)	Federally Endangered	Medium to large rivers with silty to rocky substrates. Prefers strong currents and deep pools.

SPECIES	STATUS	HABITAT DESCRIPTION
Plants		
Knowlton's Cactus (<i>Pediocactus knowltonii</i>)	Federally Endangered	Alluvial deposits that form rolling, gravelly hills in piñon-juniper and sagebrush communities (6,200-6,400 ft.).
Mancos Milkvetch (<i>Astragalus humillimus</i>)	Federally Endangered	Cracks of Point Lookout Sandstone of the Mesa Verde series (5,000-6,000 ft.).
Mesa Verde Cactus (<i>Sclerocactus mesae-verdae</i>)	Federally Threatened	Highly alkaline soils in sparse shale or adobe clay badlands of the Mancos and Fruitland formations (4,000-5,550 ft.)
San Juan milkweed (<i>Asclepias sanjuanensis</i>)	NESL Group 4	Sandy loam soils in juniper savanna and Great Basin desert scrub at 5,000-5,500 ft.

G2 = Group 2 species on the Navajo Endangered Species List (NESL); G3 = Group 3 species on the NESL; G4 = Group 4 species on the NESL. Sources: USFWS 2007; NNHP 2007.

Attachment B: Figures

Figures containing threatened, endangered or sensitive species information have been removed to protect the confidentiality of this information.

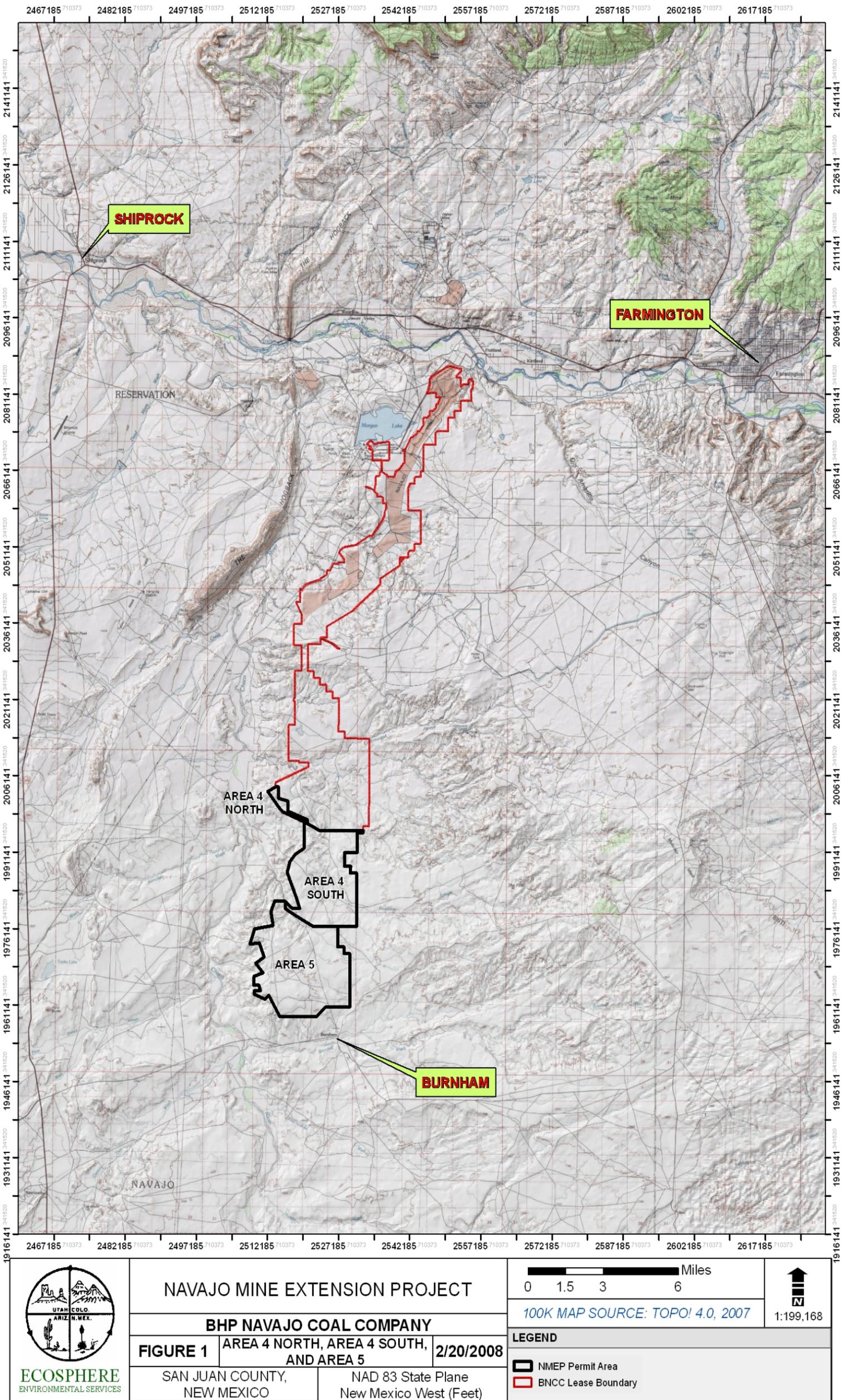


Figure 1. Vicinity map, Threatened and Endangered Species Surveys, NMEP 2007

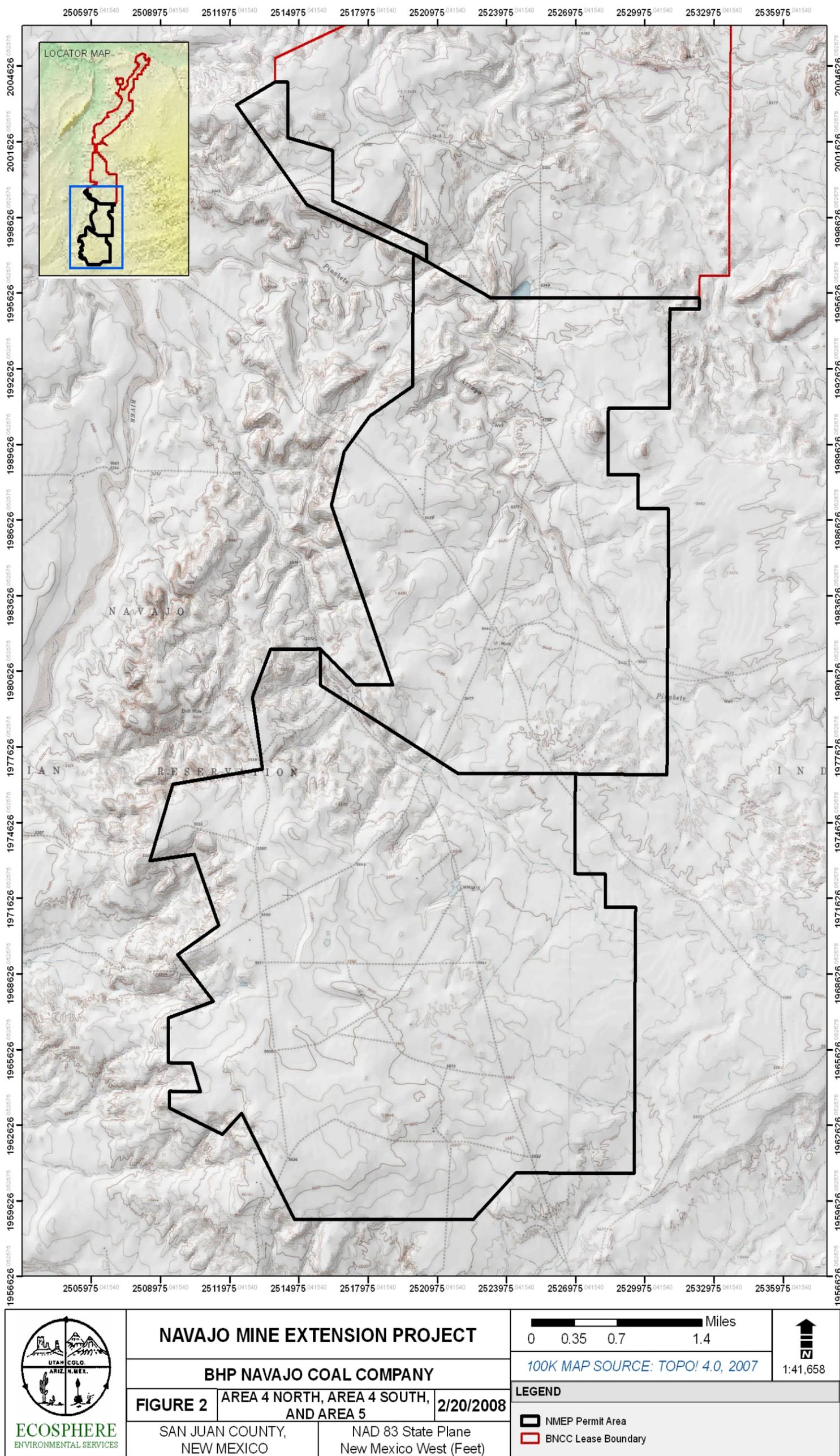


Figure 2. Map of project area, threatened and endangered species surveys, NMEP 2007.

Attachment C: 2008 Black Footed Ferret Nocturnal Survey Report

2008 BLACK-FOOTED FERRET NOCTURNAL SURVEYS

Navajo Mine Extension Project



PREPARED FOR:

BHP Navajo Coal Company
Navajo Mine Extension Project
Fruitland, New Mexico

PREPARED BY:

Ecosphere Environmental Services
2243 Main Ave, Suite 4
Durango, CO 81301

AUGUST 2008

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1.0 INTRODUCTION

In 2007, we documented five Gunnison's prairie dog (*Cynomys gunnisoni*) towns in Areas 4 South and 5 of the Navajo Mine Extension Project (NMEP), comprising just over 700 acres of potential habitat for black-footed ferrets (*Mustela nigripes*; Figure 1). The U.S. Fish and Wildlife Service (USFWS 1989) developed revised guidelines for black-footed ferret surveys that establish minimum acres of prairie dog habitat needed to support black-footed ferrets. These guidelines have been established for black-tailed prairie dogs (*Cynomys ludovicianus*) and white-tailed prairie dogs (*Cynomys leucurus*) only. Based on discussion with the USFWS biologist, we followed those guidelines established for white-tailed prairie dogs (Lynn Gemlo, USFWS biologist, personal communication), the species most similar to and of the same family as the Gunnison's prairie dog. According to these revised black-footed ferret survey guidelines (USFWS 1989), prairie dog towns or complexes greater than 200 acres but less than 1,000 acres in size are cleared by USFWS after completion of a survey for black-footed ferrets, provided that no ferrets or their sign are found. The Navajo Natural Heritage Program (NNHP) of the Department of Fish and Wildlife (NNDFW) also developed survey guidelines. These guidelines are similar to those developed by the USFWS and were also incorporated into our efforts so that our survey efforts complied with both the USFWS and the NNDFW. One prairie dog town was large enough to warrant black-footed ferret surveys (317 acres, Town E, Figure 1), and two other adjacent towns that combined, are >200 acres (218 acres, Towns C and D, Figure 1). Further, all five documented towns are within 4.2 miles of each other to comprise the minimum acreage to support black-footed ferrets (USFWS 1989). Therefore, we surveyed all five prairie dog towns for black-footed ferrets in July and August 2008.

2.0 PROJECT AREA

The NMEP is located about 20 miles (linear distance) southwest of Farmington, New Mexico (Figure 2). The NMEP is comprised of Great Basin desert-scrub habitat (Dick-Peddie 1993). Great Basin desert-scrub habitat is a cold desert ecosystem

dominated by a variety of shrubs with a sparse under story of forbs and grasses, with bare ground dominating in poor, alkaline soils (Fitzgerald et al. 1994, Dick-Peddie 1993). According to Hoogland (2006), such desert grasslands and shrublands of New Mexico provide suitable habitat for prairie dogs.

3.0 METHODOLOGY

We followed USFWS and NNDFW protocols (USFWS 1989, NNDFW 1985) for nocturnal surveys. We chose to conduct nocturnal surveys rather than diurnal surveys because the former method is designed to observe ferrets when their population is greatest (1 July - 31 October) and activity levels are highest, resulting in better detection of any possible remnant black-footed ferret population occurring on the NMEP.

Prior to conducting field work we totaled the acres of all five prairie dog towns (708 acres; Figure 1) and divided the total by 320 acres to determine the number of survey tracts (UWFWS 1989). As a result, the prairie dog towns were divided into 3 survey tracts: towns A and B represented tract 1, towns C and D represented tract 2, and tract 3 was comprised solely of town E (Figure 1).

We conducted surveys with 3 field crews each consisting of 2 biologists in a 4-wheel drive vehicle assigned to 1 survey tract. Each crew was equipped with the following:

- 1 one-million candle power spotlight (Cyclops Solutions, LLC, Grand Prairie, TX)
- 1 two-million candle power spotlight (The Black and Decker Corporation, Towson, MD)
- 1 pair 8 x 42 binoculars (Eagle Optics, Middleton, WI)
- 1 Garmin hand-held Global Positioning System (GPS) units (Garmin International Inc., Olathe, KS)
- 1 digital camera (Olympus Imaging America, Inc. Center Valley, PA)
- 1 maglite (Mag Instrument, Inc., Ontario, CA)

We spotlighted continuously from dusk until dawn on two consecutive nights (29 and 30 July 2008). On the second consecutive survey night (30 July 2008), we were

harassed by 2 local men while gathering at our nightly check-in point, just off Burnham Road near prairie dog town B. Due to safety reasons, we promptly left the project area, having completed only about ½ of the survey. Upon discussion with the USFWS (Eric Hein, Biologist, USFWS, pers. comm.) and David Mikesic (Biologist, NNHP, pers. comm.), we agreed to complete a third, albeit non-consecutive survey when BHP could provide us a security escort (see Appendix A - Correspondence). We completed the third survey on 14 August 2008 without incident.

4.0 RESULTS

The results of our surveys efforts were negative, i.e. we detected no black-footed ferrets or their sign. Additionally, we did not observe any unidentified green eyeshine.

5.0 DISCUSSION

We did not observe any black-footed ferrets or their sign during our survey efforts. Similarly, in the last three years of conducting spotlighting surveys on the NMEP, we also have not detected any black-footed ferrets or observed their sign. Further, black-footed ferrets are considered extirpated from New Mexico (Jim Stuart, Conservation Biologist, New Mexico Department of Game and Fish, pers. comm.). Therefore, we do not believe any black-footed ferrets occur on the NMEP.

6.0 LITERATURE CITED

- Dick-Peddie, W. A. 1993. *New Mexico Vegetation: Past, Present, and Future*. University of New Mexico Press, Albuquerque, New Mexico.
- Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. *Mammals of Colorado*. Denver Museum of Natural History and University Press of Colorado.
- Hoogland, J.L. 2006. *Conservation of the Black-tailed Prairie Dog: Saving North America's Western Grasslands*. Island Press, Washington, D.C.
- Navajo Nation Department of Fish and Wildlife (NNDFW). 1985. *Black-footed ferret guidelines for the Navajo Indian Reservation*. Navajo Fish and Wildlife Department. June 20, 1985.
- U.S. Fish and Wildlife Service (USFWS). 1989. *Black-footed ferret survey guidelines for compliance with the Endangered Species Act*. Denver.

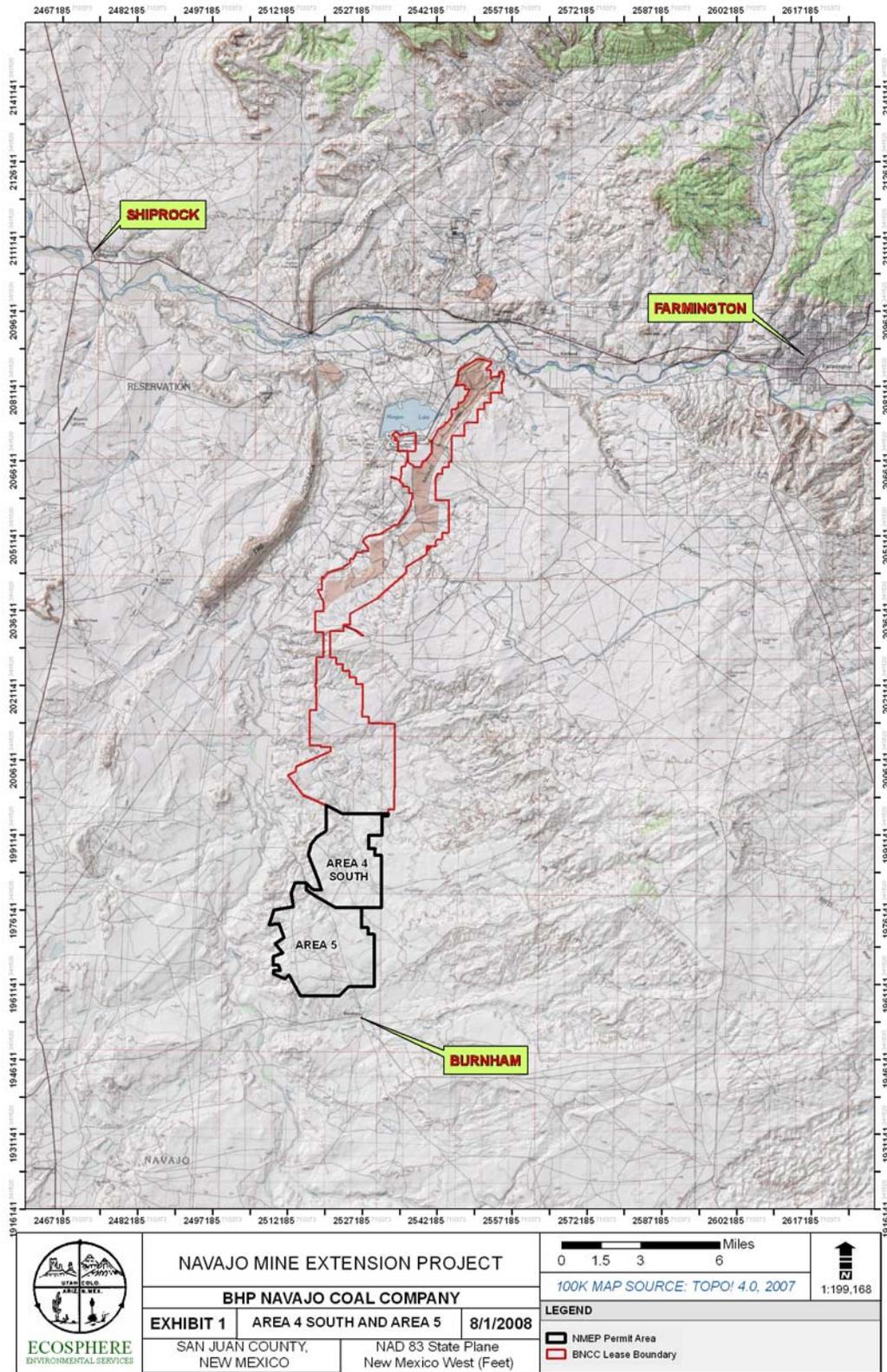


Figure 1. Vicinity map of Navajo Mine Extension Project (NMEP).

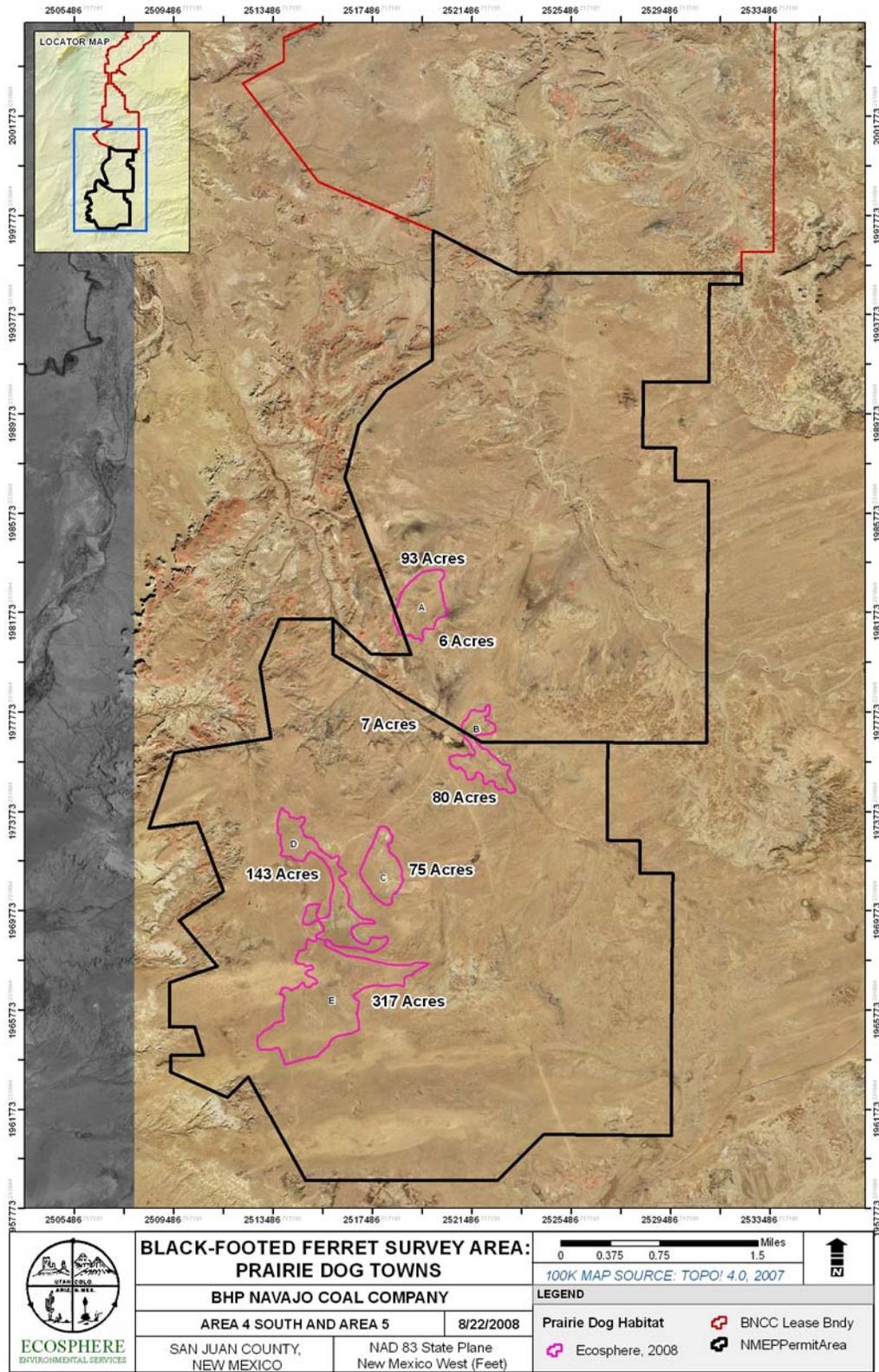


Figure 2. Map of prairie dogs towns surveyed for black-footed ferrets, Navajo Mine Extension Project (NMEP), 2008.

APPENDIX A. CORRESPONDENCE

Jennifer Zahratka

From: Eric_Hein@fws.gov
Sent: Monday, August 11, 2008 7:10 AM
To: dmikesic@navajofishandwildlife.org
Cc: 'Musslewhite, Brent'; jcole@navajofishandwildlife.org; Lynn_Gemlo@fws.gov; 'Owens, Matt P'; Jennifer Zahratka
Subject: RE: black footed ferret surveys on the Navajo Nation

We concur also Jennifer.

Eric

Eric W. Hein
U.S. Fish and Wildlife Service
2105 Osuna NE
Albuquerque, New Mexico 87113
505-761-4735; 346-2542 (fax)

"David Mikesic" <dmikesic@navajofishandwildlife.org>

08/08/2008 02:22 PM

Please respond to
<dmikesic@navajofishandwildlife.org>

To "Jennifer Zahratka" <zahratka@ecosphere-services.com>,
<Eric_Hein@fws.gov>, <Lynn_Gemlo@fws.gov>,
<jcole@navajofishandwildlife.org>

cc "'Musslewhite, Brent'" <Brent.Musslewhite@BHPBilliton.com>, "'Owens, Matt P'" <Matt.P.Owens@bhpbilliton.com>

Subject RE: black footed ferret surveys on the Navajo Nation

Jennifer et.al.,

Sorry you ran into issues with the locals while on BFF surveys; I agree with your argument below and concur that you could run the third and final survey in the upcoming week(s) and fulfill the survey needs set forth for this project. Let me know if you have any questions, or need for further comments.

*David Mikesic, Zoologist
Navajo Natural Heritage Program
Department of Fish and Wildlife
P. O. Box 1480
Window Rock, Arizona 86515
928-871-7070*

The information contained in this email is directed to the intended recipient(s) only and may be confidential and/or contain work product. Unauthorized or unintended recipients shall immediately notify David Mikesic upon receipt.

8/20/2008

Unauthorized use of this email is prohibited.

-----Original Message-----

From: Jennifer Zahratka [mailto:zahratka@ecosphere-services.com]
Sent: Friday, August 08, 2008 9:35 AM
To: Eric_Hein@fws.gov; dmikesic@navajofishandwildlife.org; Lynn_Gemlo@fws.gov; jcole@navajofishandwildlife.org
Cc: Musslewhite, Brent; Owens, Matt P
Subject: FW: black footed ferret surveys on the Navajo Nation
Importance: High

All,

We plan to proceed with a third and final, non-consecutive survey for black-footed ferrets on the Navajo Mine Extension Project (NMEP) south of Farmington next week. We did not observe any ferrets or their sign during the first of two consecutive nights of survey effort; in the last three years of spotlighting for canids we have never observed any ferrets or their sign; and, black-footed ferrets are considered extirpated from New Mexico. Further, our surveys are very thorough, with 3 teams of 2 biologists covering 708 acres of Gunnison's prairie dog habitat. Therefore, I feel that we are in compliance with the intent of the USFWS and Navajo Nation protocol surveys in that, if there was a small, remnant population of black-footed ferrets at NMEP we would discover it or will discover it with these methods.

Lynn, Eric, or David: I would still appreciate a response that you concur with this argument and our plan to proceed with the third survey next week.

Thanks for your time,
Jennifer

Jennifer L. Zahratka
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From: Jennifer Zahratka
Sent: Friday, August 01, 2008 10:18 AM
To: 'Lynn_Gemlo@fws.gov'; 'dmikesic@navajofishandwildlife.org'
Subject: black footed ferret surveys on the Navajo Nation

Lynn and David,

As you are both aware, we are conducting protocol surveys for black-footed ferrets (bff) for the Navajo Mine Extension Project just south of Farmington. We began those surveys this week; unfortunately, on the second night of surveys we had a negative encounter with two Navajo men and we left the area about 12:45 am. BHP (our client) attempted to provide security for us to complete the third survey night (which would have been last night), but were unable to do so on such short notice and promptly canceled any further survey efforts until security measures could be put in place. We will likely resume surveys between August 4th and 15th.

Could you please advise us on whether or not you feel we need to restart the surveys and complete 3 consecutive surveys or if we can simply conduct one more 3rd survey, albeit not consecutive? We did not observe any bff during the surveys we have completed thus far.

Thank you,
Jennifer

8/20/2008

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8/20/2008

APPENDIX B. DATA SHEETS

BLACK-FOOTED FERRET SURVEY FORM
NOCTURNAL (NIGHTTIME) SURVEY

Date of Survey 29/30 July 2008 Species of Prairie Dog gambelii
(Night of)

Name of Individual, Location survey was conducted:

Name: Ecosphere Environmental Services (J. Zahratka + 5 staff biologists)
Location: Navajo Mine Extension Project, ~20 miles S of Farmington, NM

Weather: Temperature begin 82°F - end 61°F Wind Speed & Direction 5-8 mph
Cloud Cover clear (N)

Begin Survey: 2030 hrs End Survey: 0530 hrs

Total Man/Hrs. 54 hrs

Source:

www.underground.com/US/NM/Farmington.html#History

General Comments: (possible ferret sign encountered, tracks observed,
unidentified green eyeshine observed etc.)

No black-footed ferrets or their sign observed.

NM STATE WILDLIFE &
NATURAL RESOURCES DEPT.

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BLACK-FOOTED FERRET SURVEY FORM
NOCTURNAL (NIGHTTIME) SURVEY

Date of Survey 30/31 July 2008 Species of Prairie Dog Gambel's

Name of Individual, Location survey was conducted:

Name: Ecosphere Environmental Services (J. Zahradka + 5 staff biologists)

Location: South of Farmington, NM, Navajo Mine Ext. Project

Weather: Temperature begin 85°F - end 60°F Wind Speed & Direction 6-10 mph (ENE)

Cloud Cover clear

Begin Survey: 2045

End Survey: 0015

Total Man/Hrs. 21

General Comments: (possible ferret sign encountered, tracks observed, unidentified green eyeshine observed etc.)

No black-footed ferrets observed, or their sign.

2008 JEM &
N.M. DEPT.

BLACK-FOOTED FERRET SURVEY FORM
NOCTURNAL (NIGHTTIME) SURVEY

Date of Survey 14/15 Aug 2008 Species of Prairie Dog gambelii
(Night of)

Name of Individual, Location survey was conducted:

Name: Ecosphere (M. Vivalda + 5 biological staff)

Location: S of Farmington, NM, Navajo Mine Extension Project

Weather: Temperature begin 70°F - end Wind Speed & Direction 6-10 mph

Cloud Cover clear (NNE)

Begin Survey: 2045 End Survey: 0530

Total Man/Hrs. 51

General Comments: www.underground.com/us/nm/farmington.html#History
(possible ferret sign encountered, tracts observed,
unidentified green eyeshine observed etc.)

No black footed ferrets or their sign observed.

W. W. ASH &
N. M. DEPT.

MV
JB