

SECTION 16

FISH AND WILDLIFE

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SECTION 16

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LIST OF REVISIONS DURING PERMIT TERM

REV.		DATE
NUMBER	REVISION DESCRIPTION	APPROVED

SECTION 16 FISH AND WILDLIFE

Navajo Transitional Energy Company (NTEC), No Name Permit (NNP) is located in northwestern New Mexico on Navajo Nation lands in San Juan County and encompasses approximately 11,526 ac of the NTEC coal lease. The NNP permit area ranges from 5,300 to 5,600 ft in elevation and is characterized by low rolling grasslands and shrublands interspersed with rocky cliffs and thin breaks. Land use in the permit area and adjacent areas is primarily livestock grazing and residential.

In 2005 and 2007, Ecosphere completed baseline surveys in Area 4 South and Area 5 for general wildlife species and Threatened and Endangered Species (TES), including species of concern (Ecosphere 2008a and Ecosphere 2008b). Results of the 2005 surveys were not submitted to NTEC in a comprehensive report, but the 2005 data was used to supplement the 2007 baseline wildlife surveys. Procedures and methodologies for the 2007 baseline general wildlife and TES species surveys were reviewed and approved by the NNDFW and the Office of Surface Mining Reclamation and Enforcement (OSM) prior to commencing fieldwork.

In 2025, Barr Engineering, formerly Ecosphere Environmental Services conducted a TES survey for the NNP area. The 2025 surveys update the 2008 Threatened and Endangered Species Survey for the Navajo Mine Extension Project, ensuring compliance with the Endangered Species Act of 1973, the Navajo Nation Code for species of concern (17 NNC 507), and the Surface Mining Control and Reclamation Act of 1977 (SMCRA). This report presents the updated survey methodologies, data collection, and results, providing the necessary information to support regulatory review and compliance for the proposed No Name permit area.

Detailed reports describing the baseline wildlife and TES species surveys in Area 4 South and Area 5 are provided in Appendix 16.A and Appendix 16.B. The 2025 updated TES survey can be found in Appendix C.

16.1 Fish and Wildlife Survey Methods

Methods used for surveying federally threatened, endangered, and sensitive (TES) and Navajo Nation sensitive species are discussed in Section 16.1.2.

16.1.1 General Wildlife

General wildlife surveys were conducted in NNP area following standard scientific protocols and NNDFW guidelines. A baseline wildlife inventory was developed by recording all wildlife species observed or documented by tracks, scat, or other signs. A detailed discussion of methodologies used for general wildlife baseline surveys is presented in Appendix 16.A.

16.1.1.1 Raptors

Systematic surveys were conducted within the permit area, plus a 1-mi buffer for all raptor species identified by NNDFW as potentially occurring or known to occur in the area. The surveys were initiated by identifying potential habitat according to U.S. Geologic Survey (USGS) topographic maps and aerial photographs of the permit area, as well as reviewing historic nest locations from previous surveys. Field surveys were conducted utilizing high-powered binoculars and spotting scopes to identify nests or breeding individuals.

16.1.1.2 Breeding Birds

General breeding bird surveys were conducted to determine avian species richness, diversity, and relative abundance within the permit area. The baseline vegetation communities, discussed in Section 15 Vegetation, were determined to be representative of different habitat types, and therefore were used to establish the various habitats found within NNP. The vegetation communities sampled for breeding birds include Alkali Wash, Arroyo Shrub, Badlands, Thin Breaks, and Sands. The Dunes vegetation community is patchily distributed and provides limited habitat for breeding birds. Consequently, this community was not sampled.

Breeding bird surveys were conducted during the peak breeding season, between mid-May and mid-June, following a random strip-transect survey methodology. A geographic information system (GIS) was used to randomly distribute transects throughout the vegetation communities. Random transect bearings were selected using a random numbers table. Two transects, each 2 km in length, were established in each of the five vegetation communities, for a total of 4 km of sample transects per vegetation community (Exhibit 16.1-1). The Thin Breaks vegetation community was patchily distributed in the permit area and was not large enough to accommodate multiple 2-km transects. Therefore, within the Thin Breaks community, one 2-km transect and two 1-km transects were established.

The following breeding bird information is calculated for each vegetation community: 1) mean number of individuals detected per 1-km transect, 2) species richness, 3) relative abundance, and 4) species diversity. Species richness refers to the total number of different species detected within a vegetation community. Relative abundance is calculated by dividing the number of individuals of each species by the total number of individuals detected. Species diversity considers both the number and of species present and the relative abundance or distribution of each species. Species diversity was calculated using Simpson's Index Diversity formula (Simpson 1949):

$$D = \frac{\sum n_i(n_i - 1)}{N(N - 1)}$$

Where: n = the total number of organisms of a particular species
 N = the total number of organisms of all species

The value of Simpson's Index ranges from 0 to 1; as the value increases from 0 to 1, species diversity also increases.

16.1.1.3 Shorebirds and Waterfowl

In summers 2005 and 2007, temporary ponds in the permit area were identified to survey for waterfowl and shorebirds, as shown on Exhibit 16.1-1. Binoculars and spotting scopes were used to scan the shorelines and water surfaces of temporary ponds; every individual waterfowl and shorebird present on each day was recorded.

16.1.1.4 Small Mammals

Small mammal trapping was conducted from July through August 2005 and May through June 2007 in Areas 4 South and 5 to document species in the Geomyidae, Heteromyidae, and Muridae families (Exhibit 16.1-1). In 2005, parallel transects with traps evenly spaced along their length, known as trapping grids, were randomly located in the Arroyo Shrub and Sands vegetation communities. In 2007, a trapping pattern known as a trapping web, which consists of twelve 100-m transects spaced at 30° from a central point, similar to spokes on a wheel, were randomly established in the Arroyo Shrub, Alkali Wash, and Sands communities. No trapping webs were established in Dunes, Thin Breaks, and Badlands communities due to the lack of suitable habitat including forage and cover for small mammals.

The presence of banner-tailed kangaroo rats (*Dipodomys spectabilis*) was documented by identifying large mounds, typically with 3 to 12 burrow openings, on a raised mound ≤ 1.2 m tall and 1.5 to 4.5 m in diameter in sandy, desert scrub, or desert grassland habitats (Mikesic et al. 2005). All previously documented mounds and any new mounds observed during 2007 vegetation surveys less than 1,500 ft away from existing two-track roads were visited and evaluated. The locations of the mounds were also recorded using a handheld GPS unit and each mound was mapped. In fall 2007, 20 to 50 live traps (8 x 9 x 23 cm-sized traps) were set at potential banner-tailed kangaroo rat mounds and trapping occurred for two consecutive nights in and around each mound.

16.1.1.5 Lagomorphs

Surveys for lagomorphs (i.e., jack rabbits [*Lepus* spp.] and cottontails [*Sylvilagus* spp.]) were conducted by visual observation concurrently with other surveys in 2005 and 2007. Any incidental sightings, as well as lagomorph tracks or scat found during other wildlife or vegetation surveys throughout the summer, were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.6 Sciurids

Surveys for sciurids (e.g., squirrels [*Spermophilus* spp.], chipmunks [*Tamias* spp.], prairie dogs [*Cynomys* spp.], etc.) were conducted concurrently with other pedestrian and driving surveys in 2005 and 2007. Any incidental sightings, as well as sciurid tracks or scat, were recorded on a standardized data sheet, including

the location using a handheld GPS unit. In October and November of 2007, selected locations of Gunnison's prairie dog (*Cynomys gunnisoni*) habitat were revisited to further document the size and boundaries of each prairie dog town (Exhibit 16.1-1). The numbers of burrows within the selected locations were enumerated by marking each counted burrow and recording it with a GPS unit to calculate the approximate burrow density. This burrow density approximation was then applied to all towns. In 2025, Barr conducted an updated survey of prairie dog towns, as shown in Appendix C, Map 6: Prairie Dog Colonies in the Permit Area.

16.1.1.7 Felids

Surveys for felids, namely bobcats (*Felis rufus*), were conducted concurrently with spotlighting surveys for kit fox in 2005 and 2007. Any incidental sightings, as well as felid tracks and scat found during other wildlife or vegetation surveys, were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.8 Canids

Surveys for canids, such as coyotes (*Canis latrans*) and foxes (*Vulpes* spp.), were conducted concurrently with spotlighting surveys for kit fox in 2005 and 2007 (Exhibit 16.1-1). Incidental sightings, including canid tracks and scat found during other wildlife or vegetation surveys were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.9 Mustelids

Surveys for mustelids, namely badgers (*Taxidea taxus*), were conducted concurrently with spotlighting surveys for kit fox in 2005 and 2007, and mapping prairie dog towns in 2007. Incidental sightings, including Mustelid tracks, scat, and observations during other wildlife or vegetation surveys, were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.10 Big Game

Surveys for big game, specifically mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), and elk (*Cervus elaphus*), were conducted concurrently with other surveys in 2005 and 2007. Any incidental sightings made during other wildlife or vegetation surveys throughout the summer and fall were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.11 Herptiles

Surveys for herptiles (i.e., reptiles and amphibians) were conducted in conjunction with other species-specific and vegetation surveys in 2005 and 2007. Any incidental sightings made during other wildlife or vegetation surveys were recorded on a standardized data sheet, including the location using a handheld GPS unit.

16.1.1.12 Fish

There are no permanent water bodies with sufficient water levels capable of supporting year-round fish populations in the permit area.

16.1.2 Threatened and Endangered Wildlife Species

Surveys for threatened and endangered species were conducted in coordination with NNHP species-specific guidelines (Mikesic et al. 2005), United States Fish and Wildlife Service (USFWS) protocols, and other accepted scientific standards. Knowledge of the area, biological expertise, and experience with the survey methods for these target species were incorporated into the survey methodologies. 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 (U.S. Fish and Wildlife Service 2008). The Navajo Nation listed species were obtained through NNHP consultation. Species-specific surveys were conducted to determine presence or absence of the following target species: 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. All of these species are listed as either threatened or endangered by the USFWS, or as a species of concern by the NNHP. Methods used for the threatened and endangered species surveys are discussed in detail in Appendix 16.B.

In the 2008 edition of the Navajo Endangered Species List (NESL) (NNHP 2008) designates the banner-tailed kangaroo rat as a Group 4 species for only select areas of the Navajo Nation. A Group 4 designation is given to a species or subspecies in which the NNDFW does not have sufficient information to designate the species as endangered (Group 2 or Group 3), however they have reason to consider them. Only the populations of banner-tailed kangaroo rat in the Arizona and Utah portions of the Navajo Nation are designated as a Group 4 species. The populations of banner-tailed kangaroo rats found in New Mexico are not included in the Group 4 designation. This change to the banner-tailed kangaroo rat's designation occurred after the completion of the baseline wildlife (Appendix 16.A) and threatened and endangered species (Appendix 16.B) surveys. These baseline surveys reflect the NESL designation of the banner-tailed kangaroo rat at the time of the surveys and not their current designation.

In 2005 and 2007, Ecosphere completed baseline surveys in Area 4 South and Area 5 for general wildlife species and TES species, including species of concern (Ecosphere 2008a and Ecosphere 2008b). Results of the 2005 surveys were not submitted to NTEC in a comprehensive report, but the 2005 data was used to supplement the 2007 baseline wildlife surveys. Procedures and methodologies for the 2007 baseline general wildlife and TES species surveys were reviewed and approved by the NNDFW and the Office of Surface Mining Reclamation and Enforcement (OSM) prior to commencing fieldwork.

In 2025, Barr Engineering, previously known as Ecosphere Environmental Services, conducted a survey for the Threatened and Endangered Species Survey in the No Name Permit area. The report updates the 2008 Threatened and Endangered Species Survey, Navajo Mine Extension Project (Ecosphere 2008). The 2025 results are located in Appendix 16.C.

16.1.2.6 Kit Fox

Four biologists, operating in pairs in separate vehicles, conducted nocturnal spotlight surveys on two consecutive nights for 2 to 4 hours after midnight on four different occasions. Survey routes included passable roads throughout Areas 4 South and 5 (Exhibit 16.1-1). While one biologist drove slowly through the survey routes, the other biologist used a two-million candlepower spotlight to scan for green eyeshine. Predator calls were used during each spotlighting session to attract canids in the area and allow for identification.

16.1.2.7 Pronghorn Antelope

According to NNHP, pronghorn antelope are not known to occur in the permit area (Mikesic et al. 2005). Therefore, no formal surveys were conducted for pronghorn; rather, surveys for pronghorn were conducted concurrently with vegetation and wildlife surveys in spring, summer, and fall. High-powered optics were used to identify distinguishing physical characteristics of pronghorn antelope and their sign.

16.2 General Fish and Wildlife Results

A total of 62 different wildlife species were documented during the 2005 and 2007 baseline surveys within the permit area (and 1-mi buffer zone for raptors), including 9 raptor species, 29 avian non-raptor species, 14 mammal species, and 10 herptile species (Table 16.2-1).

A detailed discussion on the results of the general wildlife surveys is provided in Appendix 16.A.

16.2.1 Raptors

In 2005, five raptor species were observed, including red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk, prairie falcon (*Falco mexicanus*), burrowing owl, and great-horned owl (*Bubo virginianus*). Nine raptor species were observed within the study area during the 2007 surveys. These species include northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk, ferruginous hawk, golden eagle, American kestrel (*Falco sparverius*), prairie falcon, burrowing owl, and great-horned owl. Results from ferruginous hawk, golden eagle, and burrowing owl surveys are described in Section 16.3.

16.2.2 Avian non-raptor species

A variety of non-raptor birds were documented during 2007 breeding bird surveys. Mean number of individuals per 1-km transect, species richness (i.e., number of species detected), and species diversity were calculated for five vegetation communities (Table 16.2-2). On average, Alkali Wash and Arroyo Shrub

communities equally yield the highest number of individuals (14.8 individuals per 1-km transect), while Sands and Thin Breaks communities contain slightly lower numbers (13.8 and 12.8, respectively). Badlands communities are largely devoid of breeding birds. Species richness and diversity are by far highest in Arroyo Shrub communities (16 species, 0.75, respectively) followed by Sands and Alkali Wash (7 species, 0.33 and 5 species, 0.23, respectively) (Table 16.2-2). The lowest species richness and diversity are associated with Badlands and Thin Breaks communities

Relative abundance of individual species observed during the 2007 survey are summarized by habitat type and for all habitats combined in Table 16.2-3. Horned lark (*Eremophila alpestris*) is the most abundant species. Relative abundance of all other species is less than 0.1, with the exception of mourning dove (*Zenaida macroura*), where relative abundance is 0.17 in the Arroyo Shrub habitat.

Eleven species of waterfowl and shorebirds were observed at temporary ponds in Areas 4 South and 5 in 2007 (Table 16.2-4). Observed waterfowl species include American coot (*Fulica americana*), cinnamon teal (*Anas cyanoptera*), common merganser (*Mergus merganser*), Eurasian wigeon (*Anas penelope*), and mallard (*Anas platyrhynchos*). Shorebird species include American avocet (*Recurvirostra americana*), black-crowned night heron (*Nycticorax nycticorax*), great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), spotted sandpiper (*Actitis macularius*), and Wilson's phalarope (*Phalaropus tricolor*).

Overall, more species and individuals were observed at Pond 2 than either Pond 1 or Pond 3 (Table 16.2-4). Most birds at Pond 2 were observed in May 2007, with a few observations occurring in June 2007. Two species, mallard and killdeer, exhibited evidence of breeding activities during the 2007 Pond 2 surveys. A female mallard was seen with ducklings, and a pair of killdeer was observed behaving defensively.

16.2.3 Mammal species

In 2005, three species of small mammals were documented during trap efforts. Thirteen individuals were captured 14 times in 1,202 trap nights (number of traps x number of nights x number of replicates), including 7 banner-tailed kangaroo rats with 1 recapture, 5 grasshopper mice (*Onychomys leucogaster*) and 1 Ord's kangaroo rat (*Dipodomys ordii*). All captures in 2005 were made in the Sands vegetation community; no small mammals were captured in Arroyo Shrub. In 2007, four species of small mammals were documented from trapping in approximately 2,800 trap nights. Twenty individuals were captured 21 times; 1 juvenile antelope squirrel (*Ammospermophilus leucurus*) was recaptured. Other captures included 12 deer mice (*Peromyscus maniculatus*), 4 Ord's kangaroo rats, 2 banner-tailed kangaroo rats, and 1 piñon mouse (*Peromyscus truei*). Seventy-eight percent of small mammals were captured in Arroyo Shrub habitat and 11% of small mammals were captured each in Alkali Wash and Sands habitats.

Cattle frequently trampled the trapping webs and grids after they were set. On multiple occasions in 2007, greater than or equal to 50% of traps were found closed by cattle, thereby decreasing the actual number of traps set by an unknown number and dramatically reducing trap effort (i.e., trap nights). Similar difficulties were encountered in 2005, when cattle regularly closed approximately 25% of traps.

Additionally, tunnels of pocket gophers (*Thomomys* spp.) and the mounds of banner-tailed kangaroo rats were frequently observed in sandy soils within the permit area in both the 2005 and 2007 survey years.

In 2005, prairie dogs were commonly observed, but towns were not mapped. In 2007, five major Gunnison's prairie dog towns, ranging in size from 75 to 317 ac, in Areas 4 South and 5 were mapped (Exhibit 16.1-1). Burrows were enumerated in two prairie dog towns to approximate the burrow density for all five towns. The selected prairie dog towns, Towns B and C (Exhibit 16.1-1), each had burrow densities of 5 burrows ac⁻¹.

Black-tailed jack rabbits (*Lepus californicus*) and desert cottontails (*Sylvilagus audubonii*) were frequently observed throughout the permit area, as were scat and tracks, in both 2005 and 2007. No bobcats (*Lynx rufus*), bobcat sign, or any other felids were observed in the permit area in either 2005 or 2007. During spotlighting surveys for canids in 2005, green eyeshine was observed consistently during spotlighting efforts, indicating coyotes and foxes present throughout the permit area; scat and tracks of coyote (*Canis latrans*), kit fox, and likely red fox (*Vulpes vulpes*) were also documented. Spotlighting surveys in 2005 documented the presence of two coyotes, kit foxes, and one unidentified canid within the permit area. This unidentified sighting was recorded as a pair of light green eyes approximately 1 ft above the ground and moving quickly. An individual juvenile red fox was also observed during the 2005 small mammal trap survey. In 2007, green eyeshine was consistently observed during all spotlighting surveys. All occurrences of canids during this survey were identified as kit foxes, which are discussed in Section 16.3.7. In 2007, tracks of a badger (*Taxidea taxus*) were observed next to a prairie dog burrow while mapping prairie dog towns in Area 5. Bats were often observed around dusk, likely *Pipistrellus* species, in 2005 and 2007. No incidental observations of big game, specifically mule deer or pronghorn antelope, were made during 2005 or 2007 surveys in the permit area.

16.2.4 Herptile species

Ten species of herptiles were incidentally observed within the permit area in 2005 and 2007 surveys. Observed species include plateau striped whiptail (*Cnemidophorus velox*), western whiptail (*Cnemidophorus tigris*), gopher snake (*Pituophis melanoeucus*), bull snake (*Pituophis melanoeucus* sub. *sayi*), short-horned lizard (*Phrynosoma douglasii*), western yellow-bellied racer (*Coluber constrictor* sub. *mormon*), side-blotched lizard (*Uta stansburiana*), lesser earless lizard (*Holbrookia maculata*), prairie rattlesnake (*Crotalus viridis*), and collared lizard (*Crotaphytus collaris*).

16.3 Threatened and Endangered Wildlife Results

The Navajo Nation Biological Evaluation Guidelines (Navajo Nation Department of Fish and Wildlife 1997) specifies that locations of certain species are confidential and are not to be released in a public document. NTEC, NNHP, NNDFW, and OSM have agreed on a report format, where NTEC will not report locations or population numbers of threatened, endangered, and sensitive species in public documents. Therefore, the threatened, endangered, and sensitive species report (Appendix 16.B) has been redacted to protect these species.

Prior to conducting fieldwork, Ecosphere Environmental Services biologists compiled a list of federal and Navajo Nation listed species and evaluated their habitat requirements to determine their potential to occur within and adjacent to the permit area (Table 16.3-1). Federally listed species were obtained from the USFWS Southwest Region Endangered Species list (U.S. Fish and Wildlife Service 2008). Navajo Nation listed species were obtained through NNHP consultation. The evaluation of habitat requirements eliminated several species from survey, based on the absence of suitable habitat. Therefore, no further survey was conducted for these species. Seven species were identified as having suitable habitat within and adjacent to the permit area. Species-specific surveys were to determine presence or absence of the following target species: kit fox, mountain plover, ferruginous hawk, golden eagle, burrowing owl, black-footed ferret, and pronghorn antelope. A detailed discussion on the results of the threatened and endangered species survey is provided in Appendix 16.B. In 2025, Barr Engineering, previously known as Ecosphere Environmental Services, conducted an updated survey of the TES survey. Burrowing owls were observed nesting in the No Name permit area, while ferruginous hawk and golden eagle nests were inactive. No kit fox dens were seen, but they are known to use the area. No mountain plovers were found, and prairie dog colonies, previously inactive, are now active but small. A small Mesa Verde cactus population was recorded nearby, but none within the permit area. San Juan milkweed is likely present in the area. Ongoing surveys suggest no significant changes in wildlife, though further monitoring may be needed. The findings from the 2025 survey are presented in a redacted format in Appendix C.

16.3.1 Ferruginous Hawk

In 2008 surveys, ferruginous hawks or their nests were observed either within the permit area or within a 1-mi buffer of Area 4 South and Area 5. Further discussion on the presence of ferruginous hawks and their nests is presented in Appendix 16.B. In 2025, no ferruginous hawks were observed in the NNP permit area. The results can be found in Appendix C.

16.3.2 Golden Eagle

In 2008 survey, Golden eagles or their nests were observed either within the permit area or within a 1-mi buffer of Areas 4 South and 5. Further discussion on the presence of golden eagles and their nests is presented in Appendix 16.B and Appendix 16.C. In 2025, no golden eagles were observed in the NNP permit area. The results can be found in Appendix C.

16.3.3 Burrowing Owl

Burrowing owls were documented in July 2007 during a prairie dog burrow inventory. The presence of burrowing owls was also documented on separate occasions during vegetation surveys in June 2007 and mountain plover surveys in June 2007. Detailed survey results for burrowing owl are presented in Appendix 16.B for 2008 and Appendix 16.C for 2025. In 2025, burrowing owls were observed nesting within the NNP permit.

16.3.4 Mountain Plover

Mountain plovers were observed in 2007 during the first of three USFWS protocol surveys for mountain plovers. Repeat visits to the same location during the second and third surveys failed to document any new sightings. Incidental occurrences of mountain plovers were documented during the 2007 baseline vegetation community surveys. In 2025, Detailed survey results for mountain plovers are presented in Appendix 16.B. In 2025, mountain plovers were not observed in the NNP permit area. Details of the survey can be found in Appendix C.

16.3.5 Black-footed Ferret

Nocturnal spotlighting surveys for black-footed ferrets conducted in July and August of 2008 and resulted in no observations of black-footed ferrets. Further, there were no incidental observations of black-footed ferrets or their signs during previous wildlife and vegetation surveys. Detailed survey results for black-footed ferrets are presented in Appendix 16.B. In 2025, no black-footed ferret surveys were conducted because the permit area lacked sufficient prairie dog burrows to support this species.

16.3.6 Kit Fox

Spotlighting surveys in 2005 and 2007 documented the presence of kit fox individuals and dens within the permit area. Detailed survey results for kit fox are presented in Appendix 16.B. In 2025, no kit fox dens were observed during the assessment; however, it's important to note that species-specific surveys were not carried out. Kit foxes are known to frequently inhabit and traverse the permit area, indicating their regular presence. The results of the 2025 survey are presented in Appendix 16.C.

16.3.7 Pronghorn Antelope

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

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Table 16.2-1 List of Species Documented in the No Name Permit Area

Common name	Scientific name
Northern harrier	(<i>Circus cyaneus</i>)
Cooper's hawk	(<i>Accipiter cooperii</i>)
Red-tailed hawk	(<i>Buteo jamaicensis</i>)
Ferruginous hawk	(<i>Buteo regalis</i>)
Golden eagle	(<i>Aquila chrysaetos</i>)
American kestrel	(<i>Falco sparverius</i>)
Prairie falcon	(<i>Falco mexicanus</i>)
Great-horned owl	(<i>Bubo virginianus</i>)
Burrowing owl	(<i>Athene cunicularia</i>)
American crow	(<i>Corvus brachyrhynchos</i>)
Ash-throated flycatcher	(<i>Myiarchus cinerascens</i>)
Black-throated sparrow	(<i>Amphispiza bilineata</i>)
Blue grosbeak	(<i>Passerina caerulea</i>)
Brown-headed cowbird	(<i>Molothrus ater</i>)
Common raven	(<i>Corvus corax</i>)
Horned lark	(<i>Eremophila alpestris</i>)
House finch	(<i>Carpodacus mexicanus</i>)
Killdeer	(<i>Charadrius vociferus</i>)
Lark sparrow	(<i>Chondestes grammacus</i>)
Loggerhead shrike	(<i>Lanius ludovicianus</i>)
Mountain plover	(<i>Charadrius montanus</i>)
Mourning dove	(<i>Zenaida macroura</i>)
Northern mockingbird	(<i>Mimus polyglottos</i>)
Rock wren	(<i>Salpinctes obsoletus</i>)
Say's phoebe	(<i>Sayornis saya</i>)
Spotted towhee	(<i>Pipilo maculatus</i>)
Western scrub-jay	(<i>Aphelocoma californica</i>)
Yellow warbler	(<i>Dendroica petechia</i>)
American coot	(<i>Fulica americana</i>)
Cinnamon teal	(<i>Anas cyanoptera</i>)
Common merganser	(<i>Mergus merganser</i>)
Eurasian wigeon	(<i>Anas penelope</i>)

Table 16.2-1 (Continued)

Common name	Scientific name
Mallard	(<i>Anas platyrhynchos</i>)
American avocet	(<i>Recurvirostra americana</i>)
Black-crowned night heron	(<i>Nycticorax nycticorax</i>)
Great blue heron	(<i>Ardea herodias</i>)
Spotted sandpiper	(<i>Actitis macularius</i>)
Wilson's phalarope	(<i>Phalaropus tricolor</i>)
Antelope squirrel	(<i>Ammospermophilus leucurus</i>)
Deer mouse	(<i>Peromyscus maniculatus</i>)
Ord's kangaroo rats	(<i>Dipodomys ordii</i>)
Banner-tailed kangaroo rat	(<i>Dipodomys spectabilis</i>)
Pocket gopher	(<i>Thomomys</i> spp.)
Piñon mouse	(<i>Peromyscus truei</i>)
Gunnison's prairie dog	(<i>Cynomys gunnisoni</i>)
Kit fox	(<i>Vulpes macrotis</i>)
Red fox	(<i>Vulpes vulpes</i>)
Bat	(<i>Pipistrellus</i> spp.)
Desert cottontail	(<i>Sylvilagus audubonii</i>)
Black-tailed jack rabbit	(<i>Lepus californicus</i>)
Coyote	(<i>Canis latrans</i>)
Badger	(<i>Taxidea taxus</i>)
Plateau striped whiptail	(<i>Cnemidophorus velox</i>)
Western whiptail	(<i>Cnemidophorus tigris</i>)
Gopher snake	(<i>Pituophis melanoceus</i>)
Bull snake	<i>Pituophis melanoceus</i> sub. <i>sayi</i>)
Short-horned lizard	(<i>Phrynosoma douglassii</i>)
Western yellow-bellied racer	(<i>Coluber constrictor</i> sub. <i>mormon</i>)
Side-blotched lizard	(<i>Uta stansburiana</i>)
Lesser earless lizard	(<i>Holbrookia maculata</i>)
Prairie rattlesnake	(<i>Crotalus viridis</i>)
Collared lizard	(<i>Crotaphytus collaris</i>)

Table 16.2-2 Mean Number of Individuals Detected Per 1-km Transect, Species Richness, and Index of Species Diversity Within Each Habitat Type

Summary statistic	Alkali Wash	Arroyo Shrub	Badlands	Sands	Thin Breaks
Mean	14.8	14.8	5.3	13.8	12.8
Species richness	5	16	3	7	4
Species diversity	0.23	0.75	0.19	0.33	0.12

Table 16.2-3 Relative Abundance of Breeding Birds for the 2007 Survey in the No Name Permit Area

Species	Relative abundance					Total
	Alkali Wash	Arroyo Shrub	Badlands	Sands	Thin Breaks	
American crow (<i>Corvus brachyrhynchos</i>)	-	0.03	-	-	-	0.01
Ash-throated flycatcher (<i>Myiarchus cinerascens</i>)	-	-	-	0.02	-	<0.01
Black-throated sparrow (<i>Amphispiza bilineata</i>)	-	0.03	-	0.02	-	0.01
Blue grosbeak (<i>Passerina caerulea</i>)	-	0.02	-	-	-	<0.01
Brown-headed cowbird (<i>Molothrus ater</i>)	-	0.02	-	-	-	<0.01
Burrowing owl (<i>Athene cunicularia</i>)	0.02	-	-	-	-	<0.01
Common raven (<i>Corvus corax</i>)	0.03	0.02	-	-	0.02	0.02
Ferruginous hawk (<i>Buteo regalis</i>)	-	-	-	-	0.02	<0.01
Horned lark (<i>Eremophila alpestris</i>)	0.88	0.47	0.90	0.82	0.94	0.78
House finch (<i>Carpodacus mexicanus</i>)	-	0.03	-	-	-	0.01
Killdeer (<i>Charadrius vociferus</i>)	-	0.03	-	-	-	0.01
Lark sparrow (<i>Chondestes grammacus</i>)	-	0.02	-	0.05	-	0.02
Loggerhead shrike (<i>Lanius ludovicianus</i>)	-	0.02	-	-	-	<0.01
Mountain plover (<i>Charadrius montanus</i>)	0.03	-	-	-	0.02	0.01
Mourning dove (<i>Zenaida macroura</i>)	-	0.17	0.05	0.04	-	0.05

Table 16.2-3 (Continued)

Species	Relative abundance					Total
	Alkaline Wash	Arroyo Shrub	Badlands	Sands	Thin Breaks	
Northern mockingbird (<i>Mimus polyglottos</i>)	-	0.07	-	-	-	0.02
Rock wren (<i>Salpinctes obsoletus</i>)	-	-	-	0.02	-	<0.01
Say's phoebe (<i>Sayornis saya</i>)	0.03	0.02	0.05	0.04	-	0.02
Spotted towhee (<i>Pipilo maculatus</i>)	-	0.02	-	-	-	<0.01
Western scrub-jay (<i>Aphelocoma californica</i>)	-	0.02	-	-	-	<0.01
Yellow warbler (<i>Dendroica petechia</i>)	-	0.02	-	-	-	<0.01

Table 16.2-4 Waterfowl and Shorebird Sightings Within the No Name Permit Area

Species	Pond 1	Pond 2	Pond 3
American avocet (<i>Recurvirostra americana</i>)	1	1	
American coot (<i>Fulica americana</i>)			1
Back-crowned night heron (<i>Nycticorax nycticorax</i>)	2		
Cinnamon teal (<i>Anas cyanoptera</i>)	1	4	
Common merganser (<i>Mergus merganser</i>)		1	
Eurasian wigeon (<i>Anas penelope</i>)	4		
Great blue heron (<i>Ardea herodias</i>)		1	
Killdeer (<i>Charadrius vociferus</i>)	3	6	1
Mallard (<i>Anas platyrhynchos</i>)		18	
Spotted sandpiper (<i>Actitis macularius</i>)		2	
Wilson's phalarope (<i>Phalaropus tricolor</i>)		3	
Unidentified		1	
Total	11	37	2

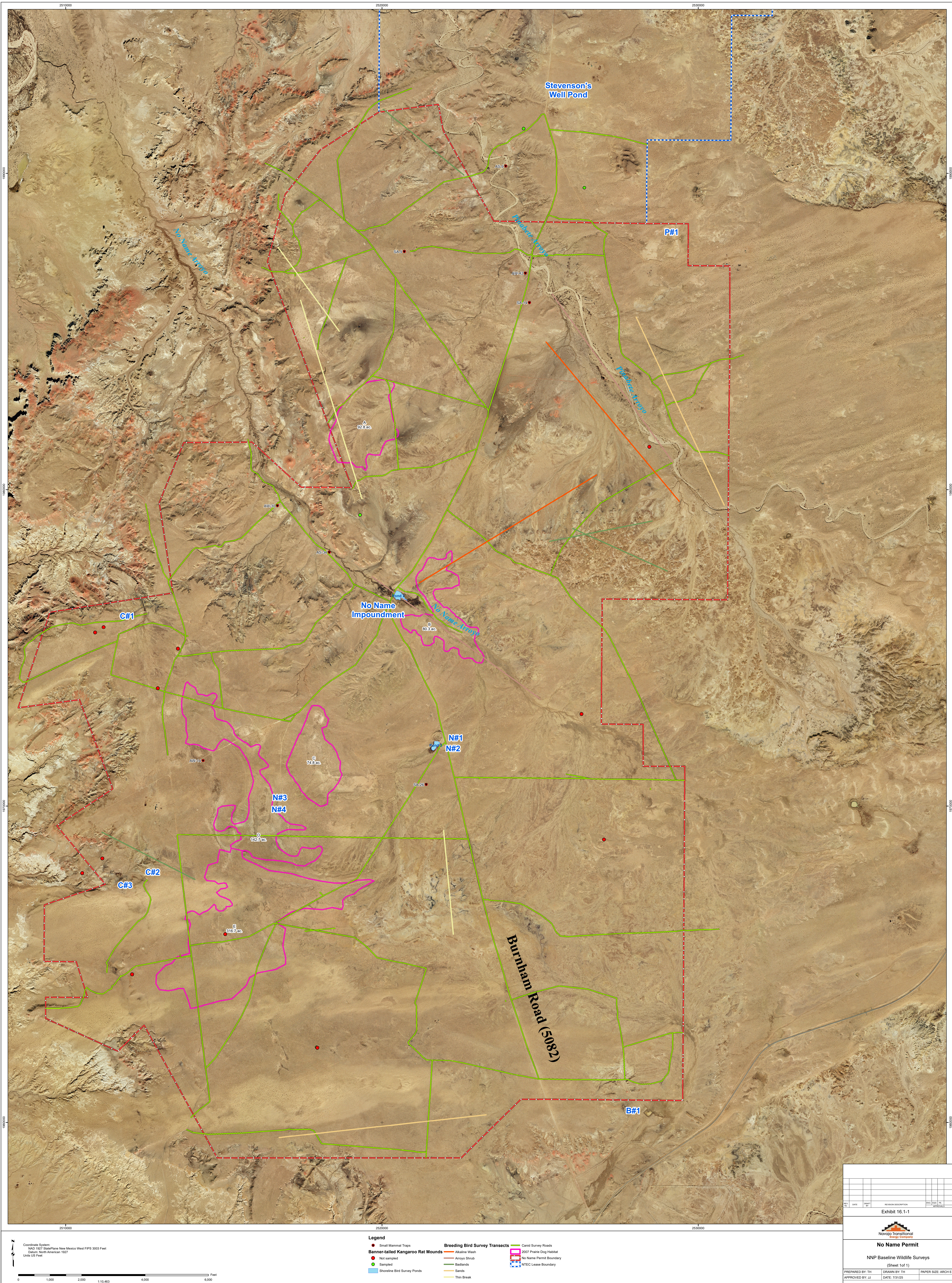
Table 16.3-1 U.S. Fish and Wildlife Service (USFWS) and Navajo Nation Natural Heritage Program (NNHP) Listed Species with the Potential to Occur in the No Name Permit Area

Species	Status*	Habitat association
Bird species		
Ferruginous hawk (<i>Buteo regalis</i>)	NESL G3	Nests in badlands, flat or rolling grasslands, and desert scrub.
Golden eagle (<i>Aquila chrysaetos</i>)	NESL G3	Open habitats in mountainous, canyon terrain. Nests primarily on steep cliffs and occasionally large trees.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Federally threatened NESL G3	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.
Mountain plover (<i>Charadrius montanus</i>)	NESL G4	Breeds in short sparse vegetation in disturbed prairies or semideserts with less than a 2-degree slope.
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Federally endangered NESL G2	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.
Western burrowing owl (<i>Athene cunicularia hypugea</i>)	NESL G4	Nests in ground burrows (often deserted prairie dog burrows) in dry open grasslands or desert scrub.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federal candidate NESL G2	Breeds in riparian woodlands with dense understory vegetation.
Fish species		
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	Federally endangered NESL G2	Large rivers with strong currents, deep pools, and quiet backwaters.
Razorback sucker (<i>Xyrauchen texanus</i>)	Federally endangered NESL G2	Medium to large rivers with silty to rocky substrates. Prefers strong currents and deep pools.
Mammal species ¹		
Black-footed ferret (<i>Mustela nigripes</i>)	Federally endangered NESL G1	Open grasslands with year-round prairie dog colonies.

Table 16.3-1 (Continued)

Species	Status*	Habitat association
Mammal species (continued)		
Chisel-tooth kangaroo rat (<i>Dipodomys microps</i>)	NESL G4	Open, sandy areas in desert scrub habitat with rock or gravel; sensitive to grazing.
Pronghorn antelope (<i>Antilocapra americana</i>)	NESL G3	Grasslands or desert-scrub with rolling or dissected hills or small mesas.
Banner-tailed Kangaroo Rat (<i>Dipodomys spectabilis</i>)	NESL G4	Grasslands or desert-scrub preferring areas with heavier soils
Kit Fox (<i>Vulpes macrotis</i>)		
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 NESL G2	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 NESL G2	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 G4	Mostly in sandy or sandy loam soils in pinion-juniper woodlands and Great Basin grassland communities. (5000 to 6200 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		

¹ The Navajo Endangered Species List (NESL) (Feb 2020) lists banner-tail kangaroo rat (*Dipodomys spectabilis*) as a Group 4 species only for populations in Arizona and Utah portions of the Navajo Nation. Populations in the New Mexico portion of the Navajo Nation are not included in the Group 4 designation.



Appendix16.A

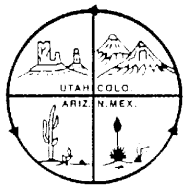
Wildlife Baseline Surveys

WILDLIFE BASELINE SURVEYS
for the
NAVAJO MINE EXTENSION PROJECT

Prepared for
BHP NAVAJO COAL COMPANY



Prepared by



ECOSPHERE ENVIRONMENTAL SERVICES

13 August 2008

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1.0 INTRODUCTION

Ecosphere Environmental Services (Ecosphere) was contracted by BHP Navajo Coal Company (BNCC) to conduct baseline wildlife surveys for the Navajo Mine Extension Project (NMEP). The NMEP comprises Area 4 South and Area 5 of the BNCC coal lease. The purpose of the wildlife baseline surveys is to ensure compliance with the Surface Mining Control and Reclamation Act of 1977 (SMCRA; 30 CFR 780.16) administered by the Office of Surface Mining Reclamation and Enforcement (OSM). The wildlife baseline surveys include general characterization and location of habitats and regionally common wildlife. We also include results of surveys for general wildlife conducted in Area 5 in 2005, but not compiled into a comprehensive report.

We also conducted surveys for species with special protection or conservation status according to the U.S. Fish and Wildlife Service and the Navajo Nation Department of Fish and Wildlife (NNDFW) Navajo Natural Heritage Program (NNHP) in 2007. We conducted 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*). The results of those surveys are provided under separate cover (Ecosphere 2008a).

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, The Newcomb NE, and The Pillar NW, New Mexico 7.5-minutes U.S. Geological Survey (USGS) quadrangles (Figure 1). The NMEP permit area comprises about 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 River 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 summer. The only standing surface water present within the boundaries of the project area is found in stock ponds scattered throughout the project area. Most precipitation in the area occurs from July through October in localized, short-duration, high-intensity thunderstorms.

2.2 *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 have been identified in this area are present in 2 or more plant communities, 6 vegetative communities with a few distinguishing or unique plant species typically define the vegetative community: dunes, sands, arroyo shrub, alkali wash, thin breaks, and badlands (Ecosphere 2004 and 2008b).

3.0 METHODS

We conducted general wildlife surveys in Areas 4 South and 5 following standard scientific protocols and NNHP guidelines. In 2007, we followed methods described in our study plan and subsequently approved by OSM and NNDFW on 29 May 2007 and 21 June 2007, respectively. We also incorporated our previous experience and knowledge of the area, as well as reviewing previous reports to develop effective survey methodologies. We recorded all wildlife species observed or documented by tracks, scat or other sign to provide a baseline wildlife inventory (Attachment 1). Ecosphere maintains a current NNDFW Special Permit for biological investigations.

3.1.1 Raptors

We systematically conducted surveys of the project area, plus a 1-mile buffer for all raptor species. We initiated raptor surveys by identifying potential habitat according to USGS topographic maps and aerial photographs of the project area, as well as reviewing historic nest locations from previous surveys. We conducted field surveys in spring of 2007 for nests or breeding individuals utilizing high-powered binoculars and spotting scopes to minimize disturbance. Field surveys in 2005 were conducted in July, outside the breeding season for most diurnal raptors; therefore, surveys consisted of identifying suitable nesting habitat, as well as any large stick nests or probable hunting perches that could indicate a raptor breeding territory.

3.1.2 Breeding Birds

We conducted general breeding bird surveys to determine avian species richness, diversity, and relative abundance in 5 vegetative communities within the project area. The sampled vegetative communities include alkali wash, arroyo shrub, badlands, thin breaks, and sands. The dunes vegetative community was not sampled, because it is patchily distributed and provides only limited habitat for breeding birds.

Breeding bird surveys were conducted following a strip-transect survey methodology. We used preliminary vegetation layers created in ArcMap © Version 9.2 (Environmental Systems Research Institute, Inc. [ESRI], Redlands, CA), based upon evaluation of aerial photographs supplied by BNCC, to randomly distribute transects throughout the 5 aforementioned vegetative communities. Transect start points were randomly selected prior to conducting field work in ArcMap using the Hawth's Analysis Tools © Version 3.23. For each start point, we also selected a random bearing for the transect using a random numbers table. We attempted to establish two 2-kilometer (km) transects in each of the 5 habitat types, for a total of 4-km sampled per habitat. The thin breaks vegetative community was patchily distributed in the project area and was not large enough to accommodate multiple 2-km transects. Therefore within the thin breaks community we established one 2-km transect and two 1-km transects totaling 4-km in length.

Breeding bird surveys were conducted during the peak breeding season, between mid-May and mid-June, for species utilizing the associated habitat types in San Juan County. Surveys were conducted between sunrise and 10:00 a.m. For each survey, biologists walked slowly along the length of the transect recording every bird visually or audibly observed within 200-meters (m) of the transect line. The 200-m distance was visually estimated by observers; therefore, some variation may have occurred. In general though, observers are not able to accurately identify most birds beyond 200-m. We identified birds to sex when known. We also recorded the method of detection, either aural, visual, or both aural and visual. Flyovers were recorded as incidental observations and were not included in the strip-transect counts.

We report the following information per habitat type and for all habitats combined: 1) mean number of individuals (per 1-km transect) detected; 2) species richness; 3) species diversity; and 4) relative abundance. Species richness refers to the number of species detected, i.e., it is the total number of different species present in a vegetative community. Species diversity takes into account the number of species as well as the relative abundance of each species. We calculated species diversity using Simpson's Index Diversity formula:

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

Where, n = the total number of organisms of a particular species and N = the total number of organisms of all species (Simpson 1949). The value of Simpson's Index ranges from 0 to 1; as the value increases from 0 to 1, species diversity also increases. Relative abundance was calculated by dividing the number of individuals of each species by the total number of individuals detected.

3.1.3 Shorebirds and Waterfowl

In summers 2005 and 2007, we identified temporary ponds in the project area to survey for waterfowl and shorebirds. In 2007, we visited temporary ponds intermittently from early May through late June, as long as they were inundated with water. Waterfowl and shorebird surveys generally occurred on the same days as raptor, mountain plover, and breeding bird surveys, to maximize our field effort and efficiency. Observations

occurred between sunrise and approximately 11:00 a.m. We used binoculars and spotting scopes to scan the shorelines and water surfaces of temporary ponds, recording every individual waterfowl and shorebird present on each day. We identified individuals to sex, when known, and recorded their general behavior to evaluate the potential for breeding activities.

3.1.4 Small Mammals

We conducted small mammal trapping from July through August 2005 and May through June 2007 in Areas 4 South and 5 (Figure 3) to document species in the Geomyidae, Heteromyidae, and Muridae families (Attachment 2). In 2005, we located trapping grids of about 140 traps in 2 vegetative communities: arroyo shrub and sands (formerly divided into sand dune, desert shrub/shadscale sand dune, and ephedra sand dune in 2005). We used Geographic Information System (GIS) to randomly locate the trapping grids in each vegetative community. We trapped each grid for 2 to 3 consecutive nights with 3 replicates in arroyo shrub and 5 replicates in sands.

In 2007, we established trapping webs in 3 of the 6 vegetative community types: arroyo shrub, alkali wash, and sands. No trapping webs were established in dunes, thin breaks, and badlands communities due to the lack of forage and cover for small mammals. Two sets of criteria were used to randomly select the site of the trapping webs in 2007. The first set of criteria was based upon using a GIS database of coverages made available by BNCC:

1. vegetative communities included were arroyo shrub, alkali wash, and sands (combined alkaline sands, sands, and saline sands in 2007), and
2. 45 random points were generated in each of the 3 habitat types within Areas 4 South and 5. Each point was displayed in ArcMap.

Each potential trapping grid was then visited in the field in a random order, and a second set of criteria was applied. A candidate-trapping web was eliminated based upon the following criteria:

3. if $\geq 40\%$ of the candidate web was dominated by a cover other than the target vegetative community,
4. if it was inaccessible by foot,

5. if grazing was recently evident or cattle were present
6. if it was >500 m from an established, passable road.

Potential sites were visited until 3 replicate trapping grids of the vegetative community met the criteria. Due to the naturally linear occurrence of alkali wash habitat, we used 2 parallel line transects of about 70 traps each in that habitat. We ran 1 trapping web or grid in 3 replicates of each habitat type for 2 to 3 consecutive nights. We used Sherman live-traps and baited traps with sweet feed, apples, and raisins. We also used polyester fiberfill inside each trap to provide nesting material and reduce trap-associated deaths as necessary. We baited and set each trap in the evening and checked and closed traps every morning at dawn. Whenever possible, we recorded the species, sex, and condition of each captured animal and uniquely marked them with a permanent marker. Experienced field biologists handled animals in accordance with standardized health procedures and immediately released individuals into the same area they were captured.

3.1.5 Lagomorphs

We surveyed for lagomorphs (i.e. jack rabbits [*Lepus* spp.] and cottontails [*Sylvilagus* spp.]) by visual observation concurrently with other surveys in 2005 and 2007. We recorded any incidental sightings, as well as lagomorph tracks or scat made during other wildlife or vegetation surveys throughout the summer on a standardized data sheet, including the location using a handheld Garmin® Global Positioning System (GPS) unit or a handheld Trimble GeoXT™ GPS unit and a photograph for unique sightings, i.e. anything other than a black-tailed jack rabbit (*Lepus californicus*) or desert cottontail (*Sylvilagus audubonii*).

3.1.6 Sciurids

We surveyed for sciurids (e.g. squirrels [*Spermophilus* spp.], chipmunks [*Tamias* spp.], prairie dogs [*Cynomys gunnisonii*] etc.) concurrently with other pedestrian and driving surveys in 2005 and 2007. We recorded any incidental sightings, as well as sciurid tracks or scat on a standardized data sheet, including the location using a handheld Garmin® GPS unit or a handheld Trimble GeoXT™ GPS unit. We searched for prairie dogs in spring when they emerge from hibernation. In October and November of 2007, we visited the locations where we observed prairie dogs. At those locations, we

identified the outer-most burrow entrances and recorded them with a GPS unit to create a polygon and determine the size of each town in ArcGIS 9.2. Within 2 prairie dog towns (or polygons), we enumerated the number of burrows, marking each counted burrow and recording it with a GPS unit, to calculate the approximate burrow densities for individual towns. 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) if more precise estimates are desired. We did not map prairie dog towns in 2005.

3.1.7 Felids

We conducted surveys for felids, namely bobcats (*Felis rufus*), concurrently with spotlighting surveys for kit fox in 2005 and 2007. We recorded any incidental sightings, as well as felid tracks and scat made during other wildlife or vegetation surveys throughout the summer and fall on a standardized data sheet, including the location using a handheld Garmin® GPS unit or a handheld Trimble GeoXT™ GPS unit.

3.1.8 Canids

We conducted surveys for canids such as coyotes (*Canis lupus*) and foxes (*Vulpes* spp.) concurrently with spotlighting surveys for kit fox in 2005 and 2007 (Ecosphere 2008a). We recorded incidental sightings, including canid tracks and scat made during other wildlife or vegetation surveys throughout the summer and fall on a standardized data sheet, including the location using a handheld Garmin® GPS unit or a handheld Trimble GeoXT™ GPS unit.

3.1.9 Mustelids

We conducted surveys for mustelids, namely badgers (*Taxidea taxus*), concurrently with spotlighting surveys for kit fox in 2005 and 2007, and mapping prairie dog towns in 2007. We also documented mustelid tracks and scat during concurrent surveys.

3.1.10 Big Game

We conducted surveys for big game concurrently with other surveys in 2005 and 2007. We recorded any incidental sightings made during other wildlife or vegetation surveys throughout the summer and fall on a standardized data sheet, including the location using a handheld Garmin® GPS unit or a handheld Trimble GeoXT™ GPS unit.

3.1.11 Herptiles

We surveyed for herptiles (i.e. reptiles and amphibians) in conjunction with other species-specific and vegetation surveys in 2005 and 2007. We recorded any incidental sightings made during other wildlife or vegetation surveys throughout the summer and fall on a standardized data sheet, including the location using a handheld Garmin® GPS unit or a handheld Trimble GeoXT™ GPS unit.

3.1.12 Fish

Currently, there are no known permanent waters capable of supporting fish species in the project area.

4.0 RESULTS

We documented a total of 62 different wildlife species during the 2005 and 2007 baseline surveys within the project area (and 1-mile buffer zone for raptors), including 9 raptor species, 29 avian non-raptor species, 14 mammal species, and 10 herptile species (Table 1).

4.1.1 Raptors

In 2005, we observed 5 raptor species including red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia hypogaea*), and great-horned owl (*Bubo virginianus*). Nine raptor species were observed within the project area during the 2007 surveys: northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk, ferruginous hawk, golden eagle (*Aquila chrysaetos*), American kestrel (*Falco sparverius*), prairie falcon, burrowing owl, and great-horned owl. Ferruginous hawk,

golden eagle, and burrowing owl are described in detail in the threatened and endangered species survey report provided under separate cover (Ecosphere 2008a).

4.1.2 Avian non-raptor species

We documented a variety of non-raptor birds during 2007 breeding bird surveys. We also calculated mean number of individuals per 1-km transect, species richness (i.e. number of individuals detected), and species diversity per habitat type for all habitats (Table 2). Alkaline wash and arroyo shrub communities equally yielded the highest number of individuals (14.8 individuals per 1-km transect each); however, sands and thin break communities followed with only slightly lower numbers (13.8 and 12.8, respectively; Table 2). Data from badland communities showed these habitats were largely devoid of breeding birds (Table 2). Species richness and diversity were by far highest in arroyo shrub communities (16 species, 0.75, respectively) followed by sands and alkaline wash (7 species, 0.33 and 5 species, 0.23, respectively; Table 2). Species richness was lowest in badlands communities (3 species), although richness in thin breaks was only slightly higher (4 species). Conversely, species diversity was lowest in thin breaks (0.12), and only slightly higher in badlands (0.19).

Relative abundance per habitat type and for all habitats is summarized in Table 3. Horned lark (*Eremophila alpestris*) was the most abundant species in each habitat type and for all habitats combined. Relative abundance of all other species was <0.1 for each habitat and all habitats combined, with the exception of mourning dove (*Zenaida macroura*), for which the relative abundance was 0.17 in the arroyo shrub habitat.

We observed 11 species of waterfowl and shorebirds at temporary ponds in Areas 4 South and 5 in 2007 (Figure 2). Waterfowl species observed included American coot (*Fulica americana*), cinnamon teal (*Anas cyanoptera*), common merganser (*Mergus merganser*), Eurasian wigeon (*Anas penelope*), and mallard (*Anas platyrhynchos*). Shorebird species observed included American avocet (*Recurvirostra americana*), black-crowned night heron (*Nycticorax nycticorax*), great blue heron (*Ardea herodias*), killdeer (*Charadrius vociferus*), spotted sandpiper (*Actitis macularius*), and Wilson's phalarope (*Phalaropus tricolor*).

Overall, we observed more species and individuals at Pond 2 than either Pond 1 or Pond 3, and both Ponds 1 and 3 combined (Figure 2). However, most birds at Pond 2 were observed in May, with few observations in June. We did not detect any waterfowl or shorebirds at Pond 1 until 1 June. Pond 3 was absent of birds during all survey days except 5 June. We observed evidence of breeding activities for 2 species, mallard and killdeer. A female mallard was seen with ducklings at Pond 2 on 30 May and 5 June. A pair of killdeer was observed behaving defensively at Pond 2 on 14 and 18 May.

4.1.3 Mammal species

In 2005, we documented 3 species of small mammals during our trap efforts. We captured 13 individuals 14 times in about 1,202 trap nights (number of traps x number of trap nights x number of replicates), including 7 banner-tailed kangaroo rats (with 1 recapture), 5 grasshopper mice (*Onychomys leucogaster*) and 1 Ord's kangaroo rat. All captures in 2005 were made in sands vegetative community; no small mammals were captured in arroyo shrub. In 2007, we documented 4 species of small mammals from trapping in about 2,800 trap nights. We captured 18 individuals 19 times, i.e. 1 individual small mammal, a juvenile antelope squirrel (*Ammospermophilus leucurus*), was recaptured. Other captures included 12 deer mice (*Peromyscus maniculatus*), 4 Ord's kangaroo rats (*Dipodomys ordii*), and 1 piñon mouse (*Peromyscus truei*). We captured 78% of small mammals in arroyo shrub habitat and 11% of small mammals each in alkali wash and saline sand habitats.

Cattle frequently trampled the trapping webs and grids after they were set. In 2007, we found $\geq 50\%$ of traps closed by cattle on multiple occasions, thereby decreasing the actual number of traps we set by an unknown number and dramatically reducing our trap effort (i.e. trap nights). We had similar difficulties in 2005, but cattle regularly closed only about 25% of traps.

Additionally, we observed tunnels of pocket gophers (*Thomomys* spp.) and frequently observed the mounds of banner-tailed kangaroo rats (*Dipodomys spectabilis*) in sandy soils within the project area in both survey years.

In 2007, we mapped 5 major prairie dog towns ranging in size from 75 to 317 acres in Areas 4 South and 5 of the NMEP (Figure 4). In 2005, we commonly observed prairie dogs, but we did not map towns.

We frequently observed black-tailed jack rabbits and desert cottontails throughout the project area, as well as scat and tracks, in both 2005 and 2007. We did not observe any bobcat (*Lynx rufus*) or their sign, or any other felids in the project area in either 2005 or 2007. During spotlighting surveys for canids in 2005 we observed green eyeshine consistently through the night during our efforts, indicating coyotes and foxes present throughout the project area; we also documented scat and tracks of coyote, kit fox, and likely red fox (*Vulpes vulpes*; Figure 5). Specifically, we sighted 2 coyotes, as well as 4 kit foxes and 1 kit fox den. One kit fox sighting included 2 individuals, possibly juveniles. We also sighted 1 unidentified canid. This unidentified sighting was recorded as a pair of light green eyes approximately 1-foot above the ground and moving quickly. And, we observed an individual juvenile red fox investigating mounds of banner-tailed kangaroo rats at our nearby traps in 2005. Spotlighting efforts for kit fox in 2007 are described in detail the threatened and endangered species survey report provided under separate cover (Ecosphere 2008a). In 2007, we observed tracks of a badger (*Taxidea taxus*) next to a prairie dog burrow while mapping prairie dog towns in Area 5. We also often observed bats around dusk, likely *Pipistrellus* species, in 2005 and 2007. We did not make any incidental observations of big game, specifically mule deer or pronghorn antelope, during 2005 or 2007 surveys in the project area.

4.1.4 Herptile species

Ten species of herptiles were incidentally observed within the project area in 2005 and 2007 surveys. The species observed included plateau striped whiptail (*Cnemidophorus velox*), western whiptail (*Cnemidophorus tigris*), gopher snake (*Pituophis melanoceus*), bull snake (*Pituophis melanoceus* sub. *sayi*), short-horned lizard (*Phrynosoma douglasii*), western yellow-bellied racer (*Coluber constrictor* sub. *mormon*), side-blotched lizard (*Uta stansburiana*), lesser earless lizard (*Holbrookia maculata*), prairie rattlesnake (*Crotalus viridis*), and collared lizard (*Crotaphytus*

collaris). Anecdotally, we encountered a relatively high number of prairie rattlesnakes in Area 5 during 2005 surveys.

5.0 SUMMARY

The primary goal of monitoring wildlife is to ensure reclaimed areas of NMEP are capable of supporting post-mining land uses of livestock grazing and wildlife habitat. The NMEP provides habitat for a variety of wildlife species, including 9 raptor species, 29 avian non-raptor species, 14 mammal species, and 10 herptile species, some of which are sensitive species. In order to identify the presence of wildlife species and their habitats, including sensitive species, we suggest annual monitoring continue in accordance with SMCRA permitting. Further, we suggest mitigation measures and reclamation efforts be evaluated annually and improvements and adjustments be made accordingly to reduce the impact of mining on wildlife as intended.

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7.0 TABLES

Table 1. List of species documented in the project area, Navajo Mine Extension Project, BNCC, 2007.

Northern harrier	(<i>Circus cyaneus</i>)
Cooper's hawk	(<i>Accipiter cooperii</i>)
red-tailed hawk	(<i>Buteo jamaicensis</i>)
ferruginous hawk	(<i>Buteo regalis</i>)
golden eagle	(<i>Aquila chrysaetos</i>)
American kestrel	(<i>Falco sparverius</i>)
prairie falcon	(<i>Falco mexicanus</i>)
great-horned owl	(<i>Bubo virginianus</i>)
burrowing owl	(<i>Athene cunicularia</i>)
American crow	(<i>Corvus brachyrhynchos</i>)
ash-throated flycatcher	(<i>Myiarchus cinerascens</i>)
black-throated sparrow	(<i>Amphispiza bilineata</i>)
blue grosbeak	(<i>Passerina caerulea</i>)
brown-headed cowbird	(<i>Molothrus ater</i>)
common raven	(<i>Corvus corax</i>)
horned lark	(<i>Eremophila alpestris</i>)
house finch	(<i>Carpodacus mexicanus</i>)
killdeer	(<i>Charadrius vociferus</i>)
lark sparrow	(<i>Chondestes grammacus</i>)
loggerhead shrike	(<i>Lanius ludovicianus</i>)
mountain plover	(<i>Chardrius montanus</i>)
mourning dove	(<i>Zenaida macroura</i>)
northern mockingbird	(<i>Mimus polyglottos</i>)
rock wren	(<i>Salpinctes obsoletus</i>)
Say's phoebe	(<i>Sayornis saya</i>)
spotted towhee	(<i>Pipilo maculatus</i>)
western scrub-jay	(<i>Aphelocoma californica</i>)
yellow warbler	(<i>Dendroica petechia</i>)
American coot	(<i>Fulica americana</i>)
cinnamon teal	(<i>Anas cyanoptera</i>)
common merganser	(<i>Mergus merganser</i>)
Eurasian wigeon	(<i>Anas penelope</i>)
mallard	(<i>Anas platyrhynchos</i>)
American avocet	(<i>Recurvirostra americana</i>)
black-crowned night heron	(<i>Nycticorax nycticorax</i>)
great blue heron	(<i>Ardea herodias</i>)
spotted sandpiper	(<i>Actitis macularius</i>)
Wilson's phalarope	(<i>Phalaropus tricolor</i>)
antelope squirrel	(<i>Ammospermophilus leucurus</i>)
deer mouse	(<i>Peromyscus maniculatus</i>)
Ord's kangaroo rats	(<i>Dipodomys ordii</i>)
banner-tailed kangaroo rat	(<i>Dipodomys spectabilis</i>)
pocket gopher	(<i>Thomomys spp.</i>)

Table 1. Continued.

piñon mouse	(<i>Peromyscus truei</i>)
Gunnison's prairie dog	(<i>Cynomys gunnisoni</i>)
kit fox	(<i>Vulpes macrotis</i>)
red fox	(<i>Vulpes vulpes</i>)
bat	(<i>Pipistrellus</i> spp.)
desert cottontail	(<i>Sylvilagus audobonii</i>)
black-tailed jack rabbit	(<i>Lepus californicus</i>)
coyote	(<i>Canis latrans</i>)
badger	(<i>Taxidea taxus</i>)
plateau striped whiptail	(<i>Cnemidophorus velox</i>)
western whiptail	(<i>Cnemidophorus tigris</i>)
gopher snake	(<i>Pituophis melanoceus</i>)
bull snake	(<i>Pituophis melanoceus</i> sub. <i>sayi</i>)
short-horned lizard	(<i>Phrynosoma douglassii</i>)
western yellow-bellied racer	(<i>Coluber constrictor</i> sub. <i>mormon</i>)
side-blotched lizard	(<i>Uta stansburiana</i>)
lesser earless lizard	(<i>Holbrookia maculata</i>)
prairie rattlesnake	(<i>Crotalus viridis</i>)
collared lizard	(<i>Crotaphytus collaris</i>)

Table 2. Mean number of individuals detected per 1-km transect, species richness, (i.e. number of species detected), and index of species diversity (Simpson 1949), for strip transects conducted in 5 vegetative communities Areas 4 South and 5 during breeding bird surveys, Navajo Mine Extension Project (NMEP), BHP Navajo Coal Company (BNCC) mine lease area, 2007. Bolding indicates highest value for that statistic.

Summary Statistic	Alkali Wash	Arroyo Shrub	Badlands	Sands	Thin Breaks
Mean no. individuals	14.8	14.8	5.3	13.8	12.8
Species richness	5	16	3	7	4
Species diversity	0.23	0.75	0.19	0.33	0.12

Table 3. Relative abundance of bird species calculated from breeding bird survey data from Areas 4 South and 5, Navajo Mine Extension Project, BNCC Mine lease area, 2007. The highest relative abundance (horned lark) in each vegetative community is in bold text.

Species	<u>Relative Abundance</u>					Total
	Alkaline Wash	Arroyo Shrub	Badlands	Sands	Thin Breaks	
American crow (<i>Corvus brachyrhynchos</i>)	-	0.03	-	-	-	0.01
Ash-throated flycatcher (<i>Myiarchus cinerascens</i>)	-	-	-	0.02	-	<0.01
Black-throated sparrow (<i>Amphispiza bilineata</i>)	-	0.03	-	0.02	-	0.01
Blue grosbeak (<i>Passerina caerulea</i>)	-	0.02	-	-	-	<0.01
Brown-headed cowbird (<i>Molothrus ater</i>)	-	0.02	-	-	-	<0.01
Burrowing owl (<i>Athene cunicularia</i>)	0.02	-	-	-	-	<0.01
Common raven (<i>Corvus corax</i>)	0.03	0.02	-	-	0.02	0.02
Ferruginous hawk (<i>Buteo regalis</i>)	-	-	-	-	0.02	<0.01
Horned lark (<i>Eremophila alpestris</i>)	0.88	0.47	0.90	0.82	0.94	0.78
House finch (<i>Carpodacus mexicanus</i>)	-	0.03	-	-	-	0.01
Killdeer (<i>Charadrius vociferus</i>)	-	0.03	-	-	-	0.01
Lark sparrow (<i>Chondestes grammacus</i>)	-	0.02	-	0.05	-	0.02
Loggerhead shrike (<i>Lanius ludovicianus</i>)	-	0.02	-	-	-	<0.01
Mountain plover (<i>Chardrius montanus</i>)	0.03	-	-	-	0.02	0.01
Mourning dove (<i>Zenaida macroura</i>)	-	0.17	0.05	0.04	-	0.05
Northern mockingbird (<i>Mimus polyglottos</i>)	-	0.07	-	-	-	0.02
Rock wren (<i>Salpinctes obsoletus</i>)	-	-	-	0.02	-	<0.01
Say's phoebe (<i>Sayornis saya</i>)	0.03	0.02	0.05	0.04	-	0.02
Spotted towhee (<i>Pipilo maculatus</i>)	-	0.02	-	-	-	<0.01
Western scrub-jay (<i>Aphelocoma californica</i>)	-	0.02	-	-	-	<0.01
Yellow warbler (<i>Dendroica petechia</i>)	-	0.02	-	-	-	<0.01

8.0 FIGURES

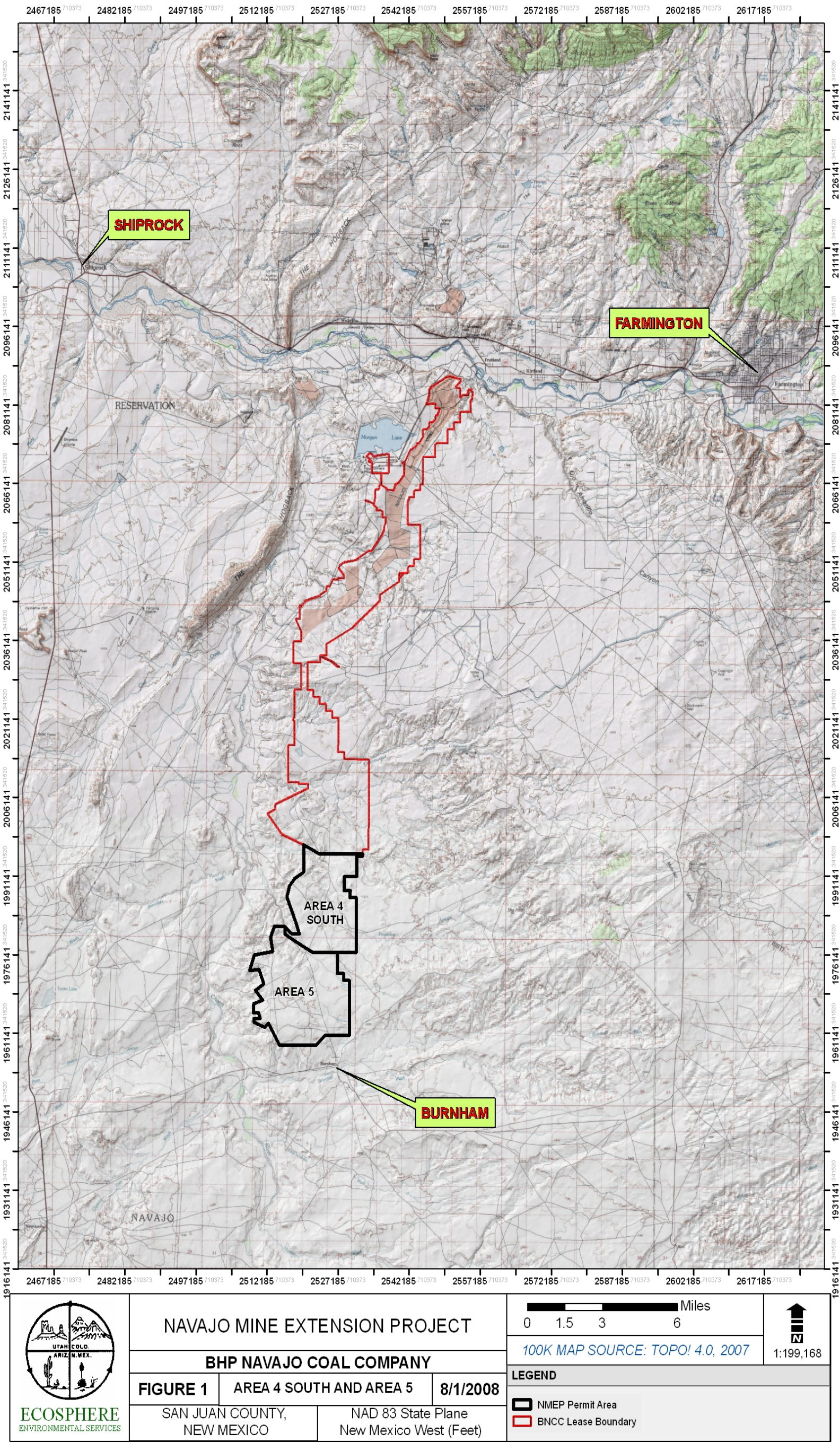


Figure 1. Vicinity map and project area for 2005 and 2007 Wildlife Baseline Inventories, Navajo Mine Extension Project, BNCC Mine lease area.

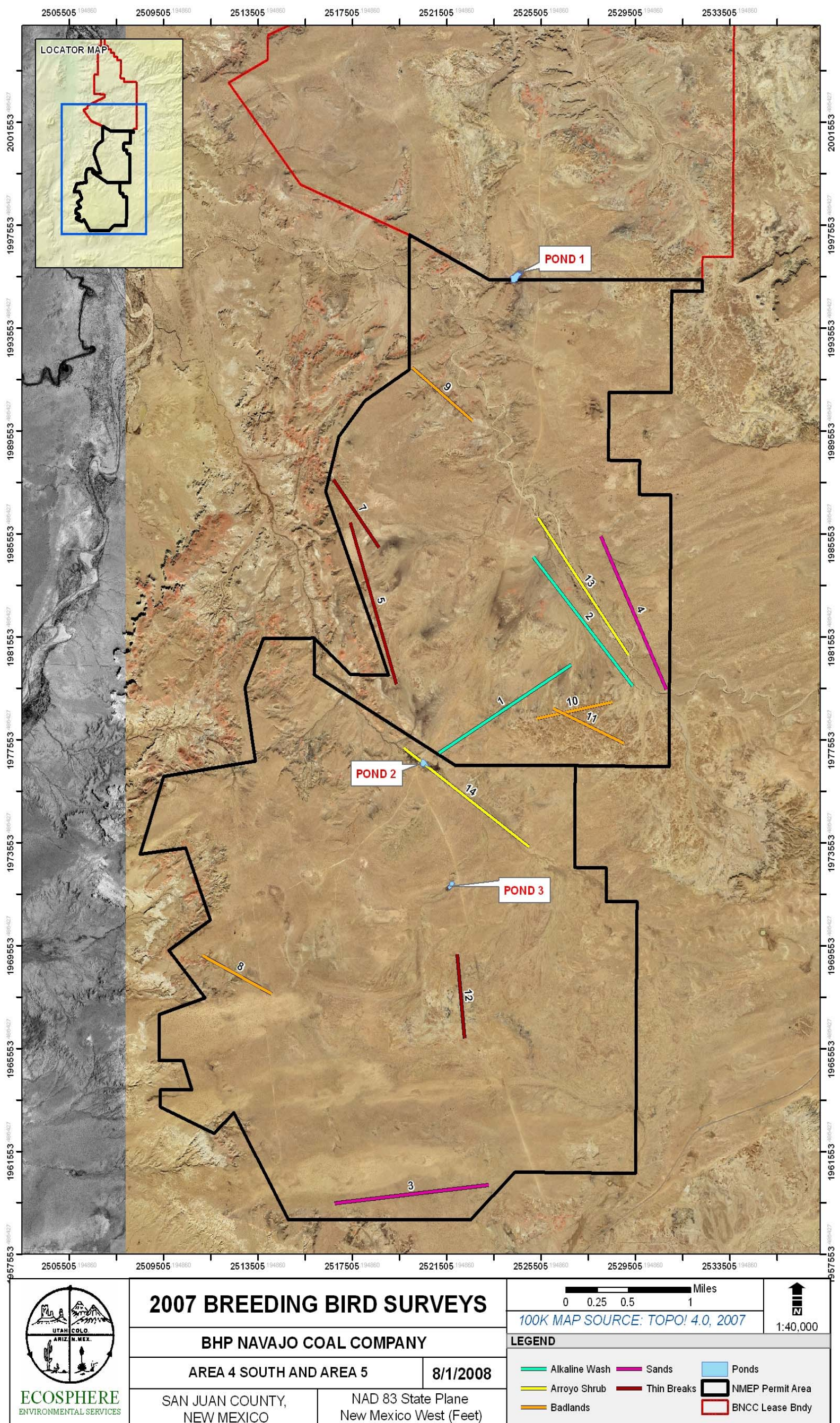


Figure 2. The locations of transects and ponds for breeding birds surveys, Navajo Mine Extension Project, BNCC Mine lease area.

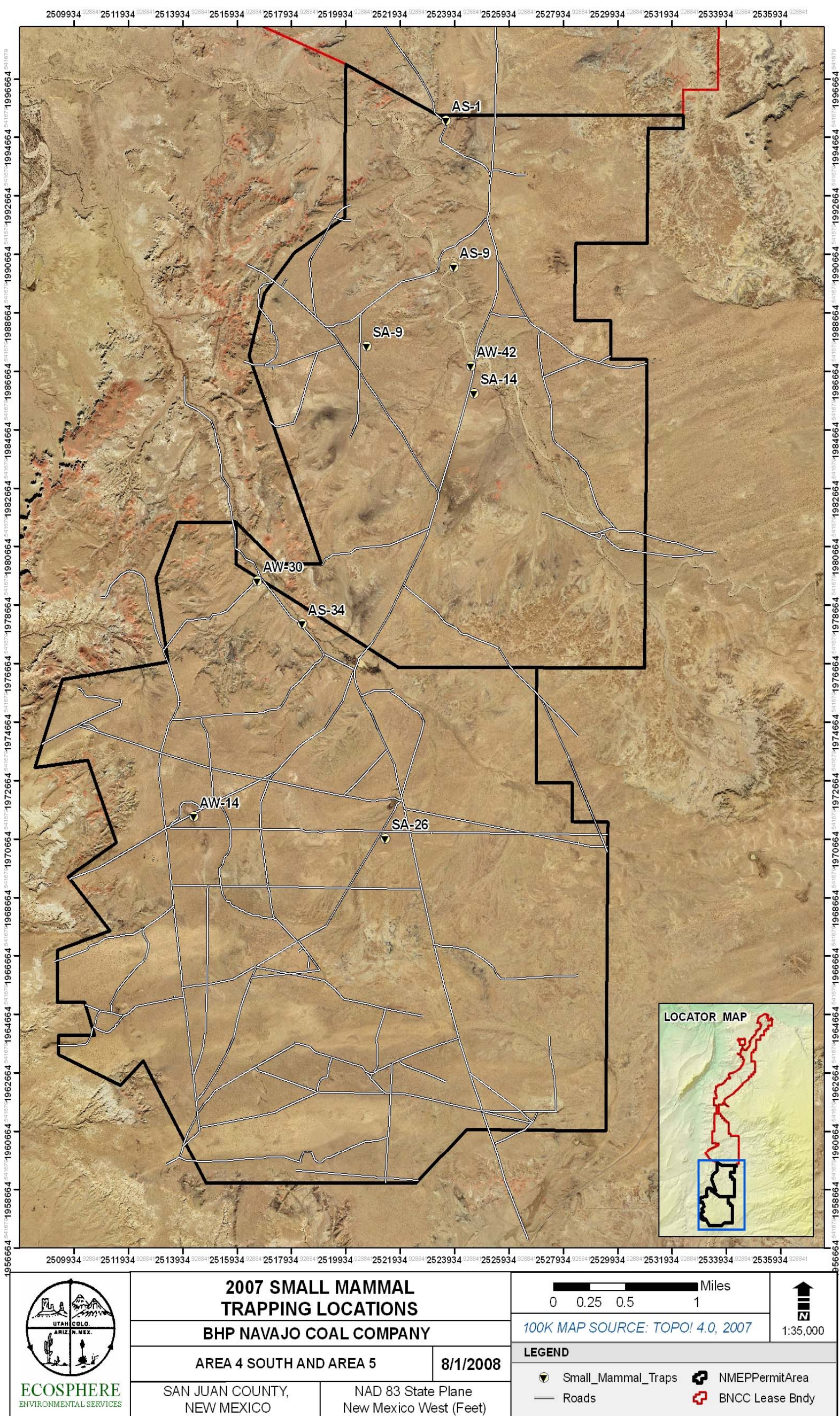


Figure 3. The locations of small mammal trapping webs and grids in 3 habitat types arroyo shrub (AS), alkali wash (AW) and sands (SA), 2007, and in 2 habitat types (AS and SA) in 2005, Navajo Mine Extension Project, BNCC Mine lease area.

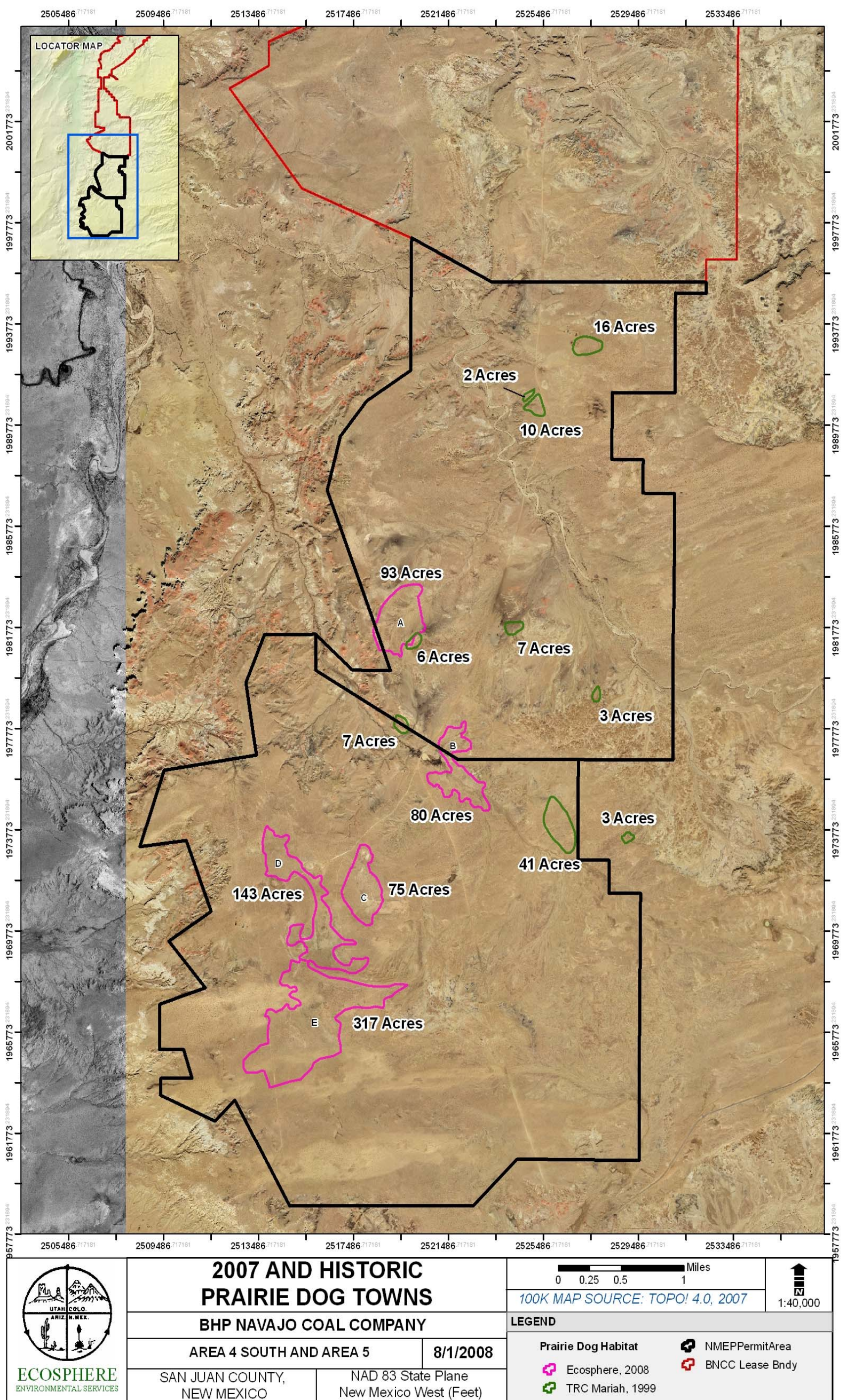


Figure 4. Prairie dog towns mapped within the project area and their respective size, Navajo Mine Extension Project, BNCC Mine lease area, 2007.

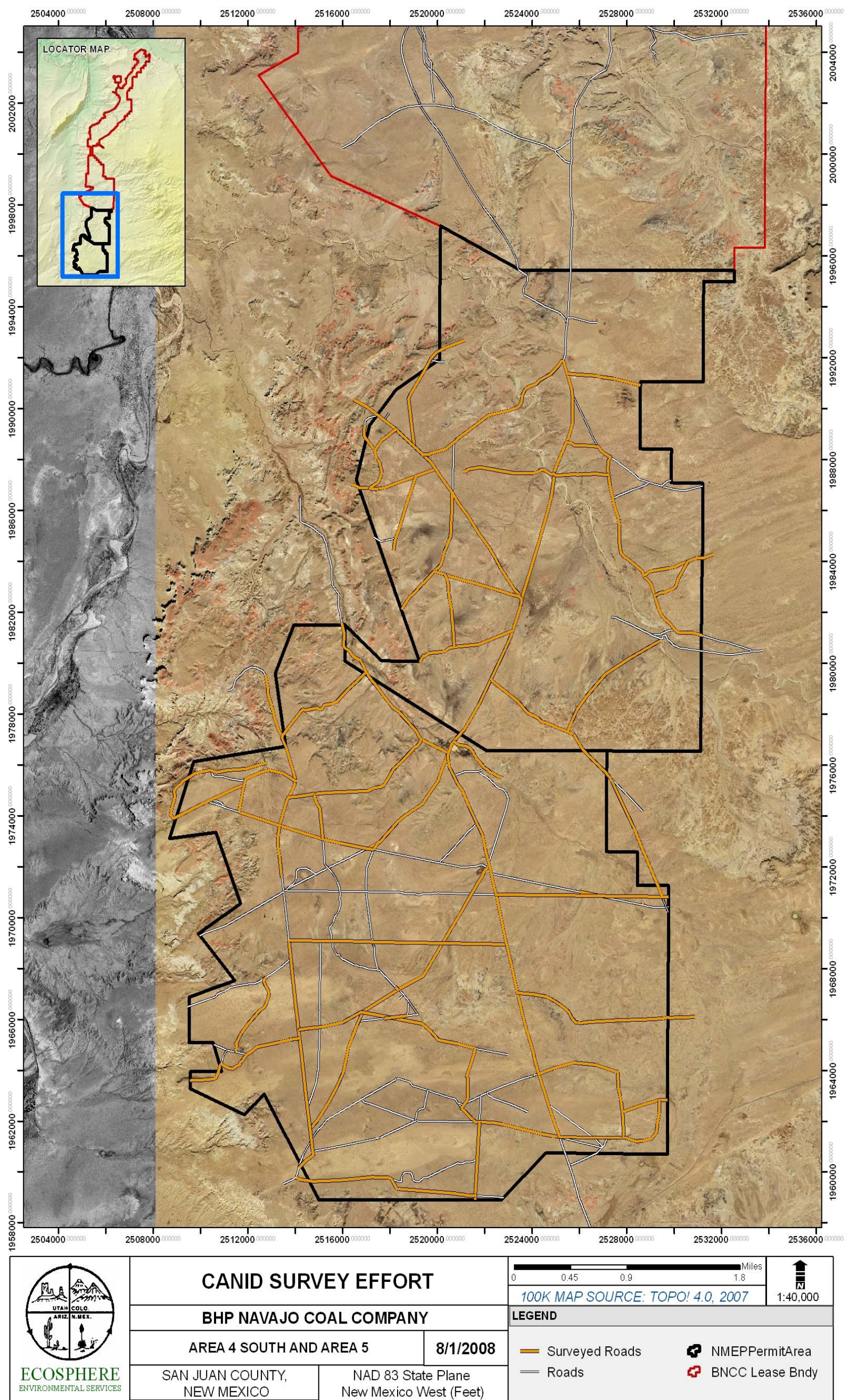


Figure 5. Spotlighting survey effort for canids in 2005 and target spotlighting surveys for kit fox in 2007 (Ecosphere 2008a) Navajo Mine Extension Project, BNCC Mine lease area.

9.0 ATTACHMENTS

Attachment 1. Data sheet for reconnaissance observations, 2005 and 2007, BNCC Mine Lease.

Reconnaissance Observations

<u>Date and Time</u>	<u>Observation</u>	<u>UTM Coordinates (NAD 83)</u>	<u>Location</u> IV North, IV South , V	
			Other:	
<u>Habitat type</u> (arroyo shrub, alkali wash, sands, dunes, thin-break, badlands, or specify)		<u>Biologist</u>	<u>Photo</u> Yes No	
<u>Description</u>				

<u>Date and Time</u>	<u>Observation</u>	<u>UTM Coordinates (NAD 83)</u>	<u>Location</u> IV North, IV South , V	
			Other:	
<u>Habitat type</u> (arroyo shrub, alkali wash, sands, dunes, thin-break, badlands, or specify)		<u>Biologist</u>	<u>Photo</u> Yes No	
<u>Description</u>				

<u>Date and Time</u>	<u>Observation</u>	<u>UTM Coordinates (NAD 83)</u>	<u>Location</u> IV North, IV South , V	
			Other:	
<u>Habitat type</u> (arroyo shrub, alkali wash, sands, dunes, thin-break, badlands, or specify)		<u>Biologist</u>	<u>Photo</u> Yes No	
<u>Description</u>				

Vegetation and Wildlife Baselines

Attachment 2. Data sheet for small mammal trapping, 2005 and 2007, BNCC Mine Lease.

Capture Data for Small Mammal Trapping

Set Date:	# of Traps:	Habitat Type and # (Grid #):
Check Date:	Biologists:	Weather and Moon of trap set (night):
UTMs:		Weather and Moon of trap check (day):

Trap #	Species	Mark	Sex	Comments

Appendix16.B

2008 Threatened and Endangered Species Surveys

Navajo Mine Extension Project

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

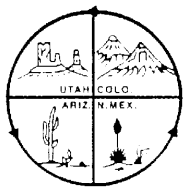
Threatened and Endangered Species Surveys

Navajo Mine Extension Project

Prepared for:

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

Prepared by:



ECOSPHERE ENVIRONMENTAL SERVICES

August 2008

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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-minutes 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 2004a, 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 crassiseppala*), 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.

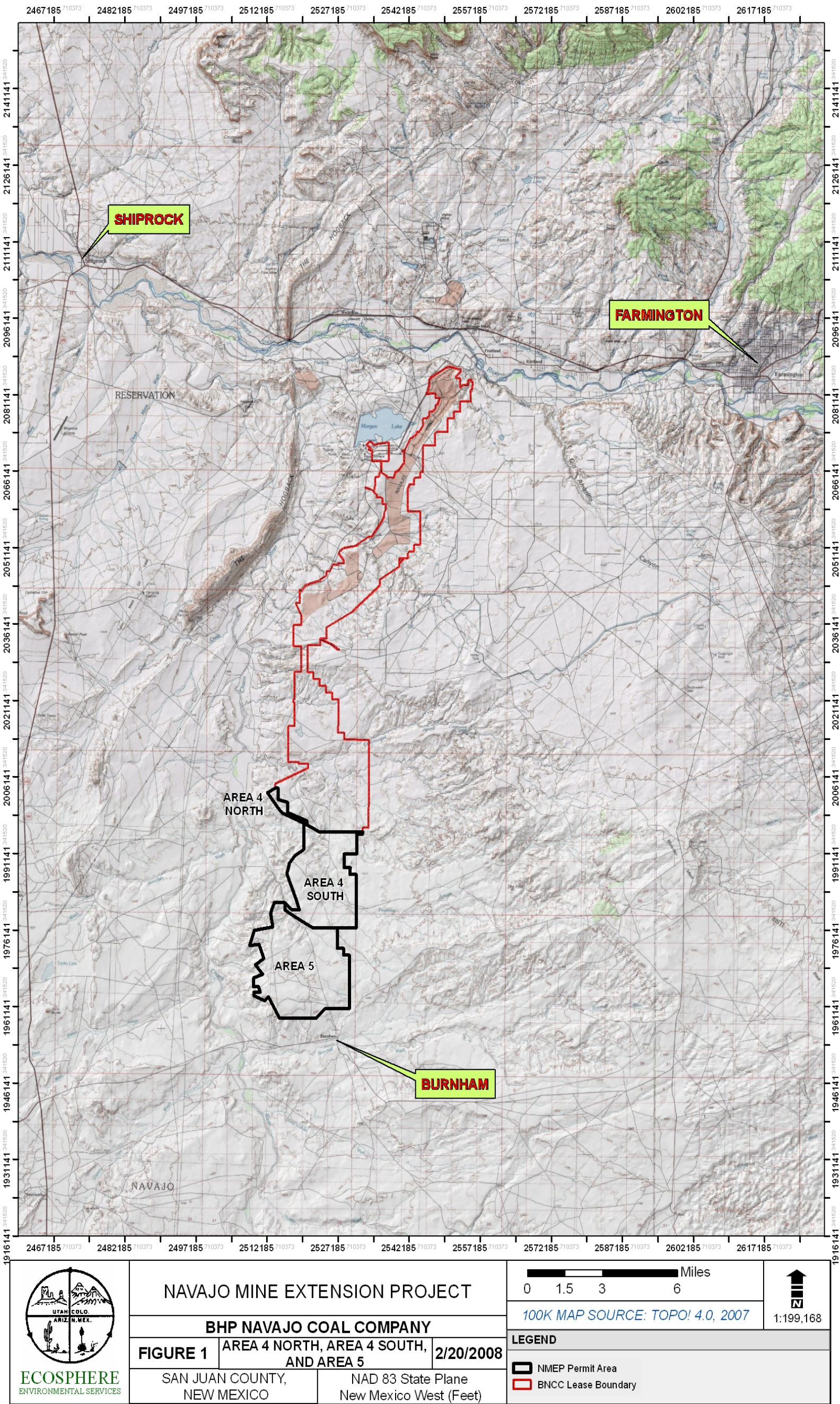


Figure 1. Vicinity map, Threatened and Endangered Species Surveys, NMEP 2007

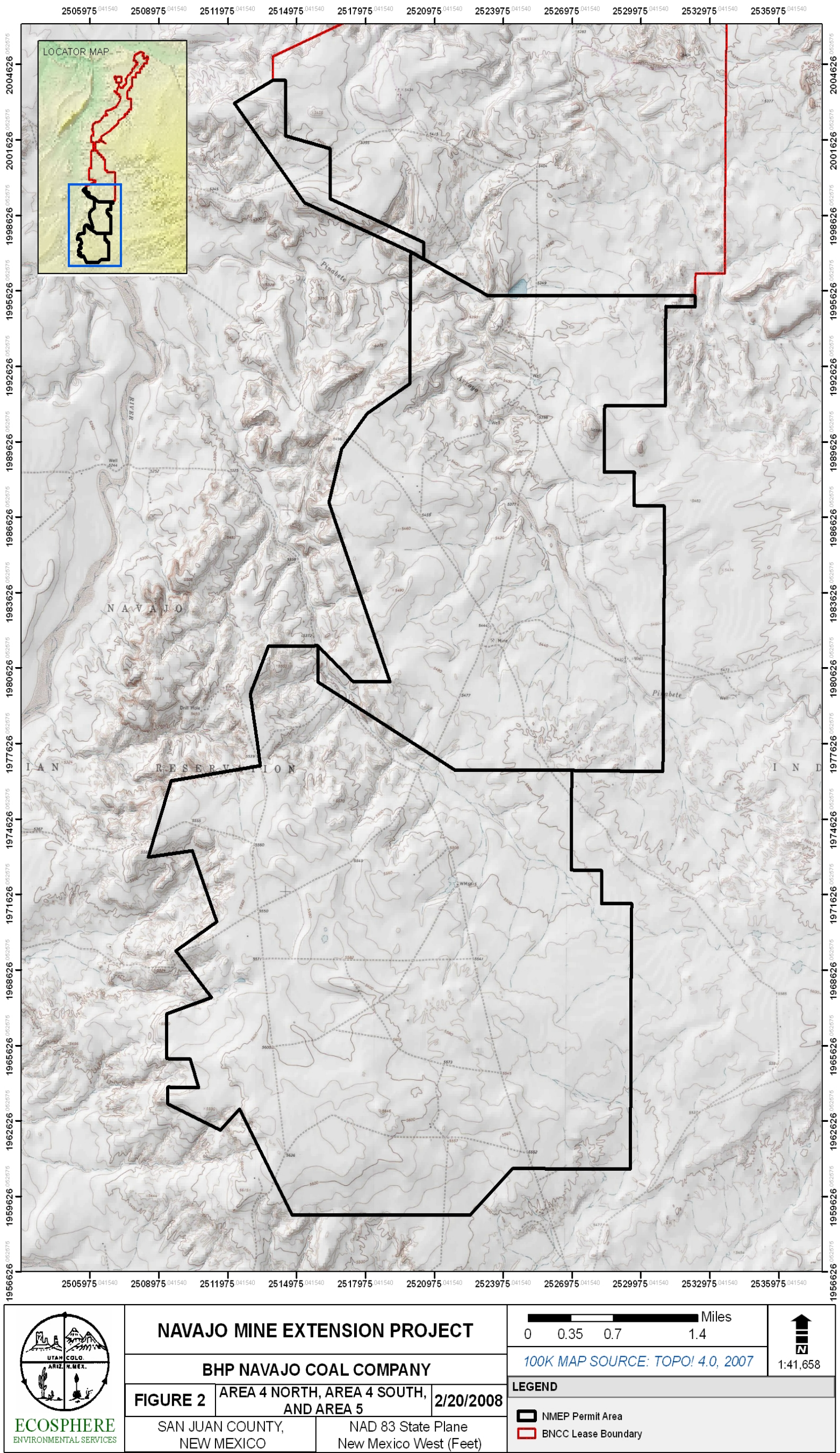


Figure 2. Map of project area, threatened and endangered species surveys, NMEP 2007.

Attachment C: 2008 Black Footed Ferret Nocturnal Survey Report

2008 BLACK-FOOTED FERRET NOCTURNAL SURVEYS

Navajo Mine Extension Project



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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

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- Hoogland, J.L. 2006. Conservation of the Black-tailed Prairie Dog: Saving North America's Western Grasslands. Island Press, Washington, D.C.
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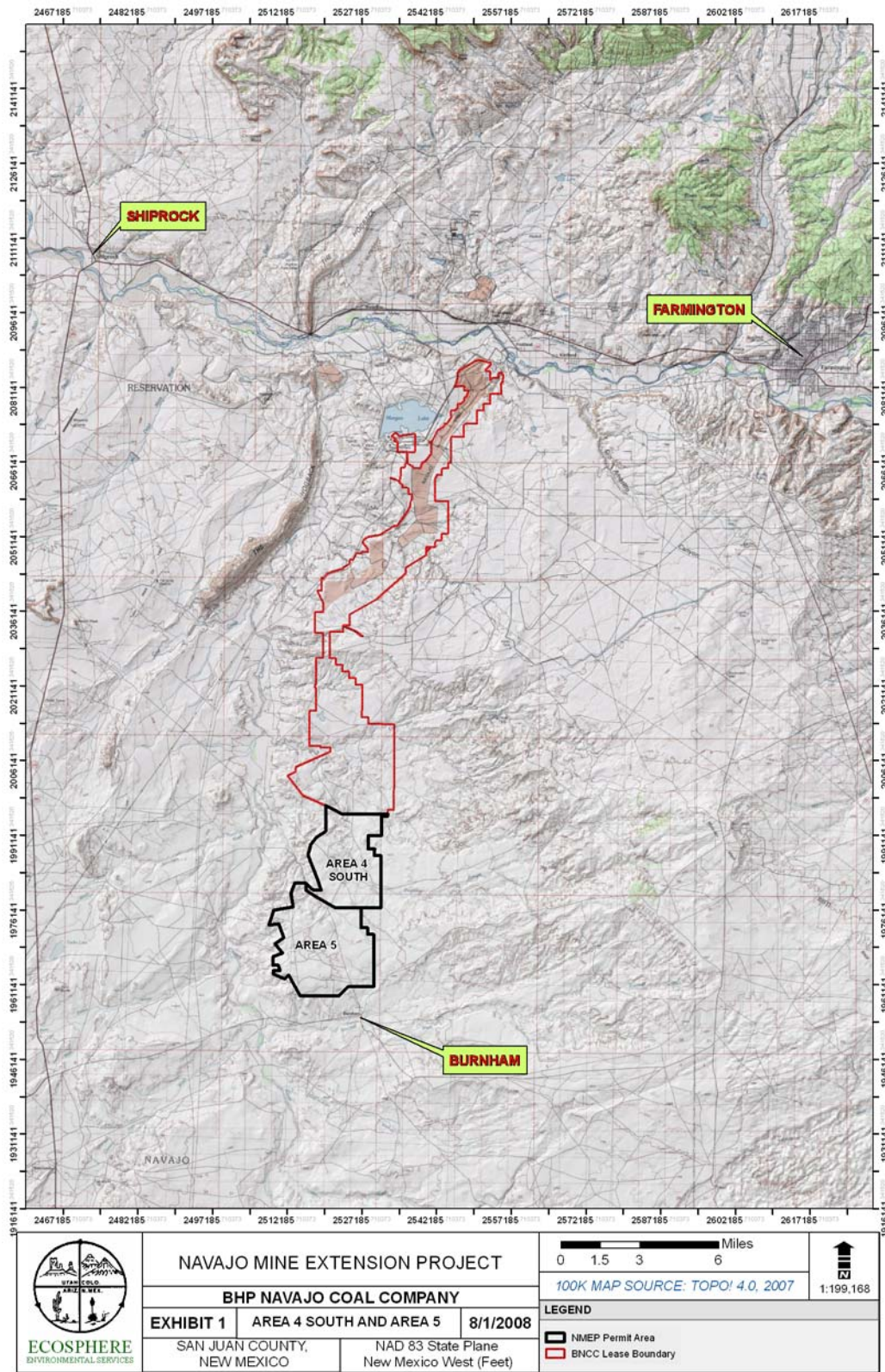


Figure 1. Vicinity map of Navajo Mine Extension Project (NMEP).

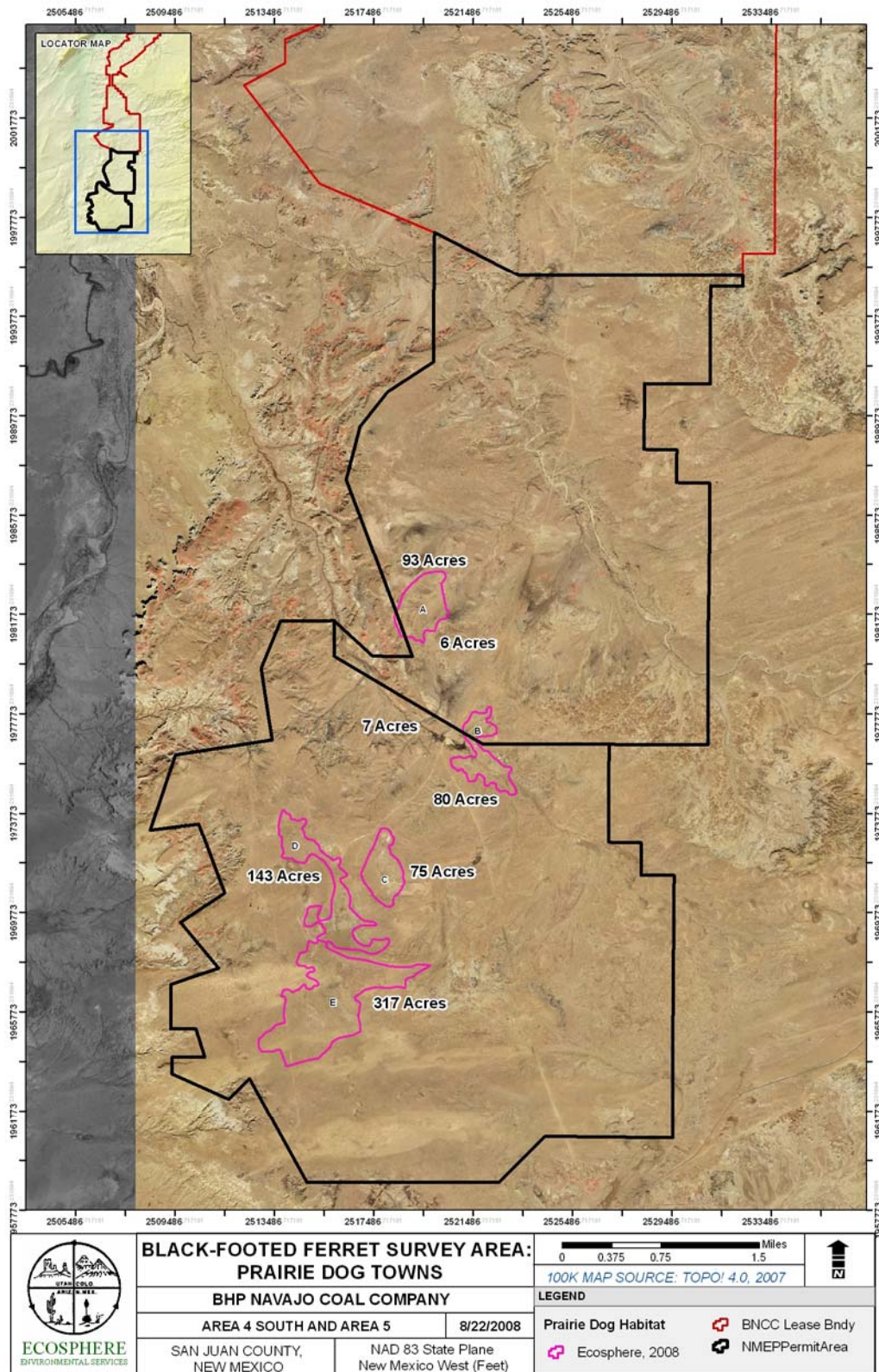


Figure 2. Map of prairie dogs towns surveyed for black-footed ferrets, Navajo Mine Extension Project (NMEP), 2008.

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

Jennifer L. Zahratka
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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.

NMFS ASH &
NMFS DEPT.

83

BLACK-FOOTED FERRET SURVEY FORM
NOCTURNAL (NIGHTTIME) SURVEY

Date of Survey 30/31 July 2008 Species of Prairie Dog Gunnisoni

Name of Individual, Location survey was conducted:

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

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

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

Cloud Cover clear (ENE)

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.

N. M. ASEM &
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

www.underground.com/us/NM/Farmington.htm/#History
General Comments: (possible ferret sign encountered, tracks observed,
unidentified green eyeshine observed etc.)

No black footed ferrets or their sign observed.

W. ASH &
DEPT.

MV
JB

Appendix16.C

2025 Threatened and Endangered Species Surveys

Navajo Mine Extension Project

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



Threatened and Endangered Species Surveys

No Name Permit Project



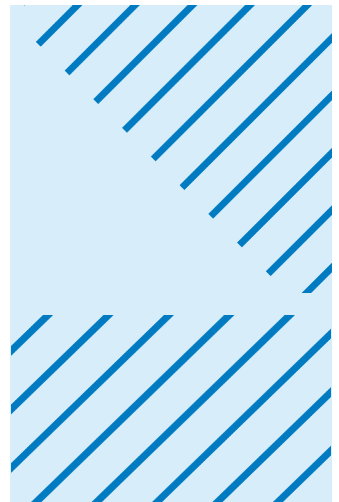
Prepared for
Navajo Transitional Energy Company
PO Box 3767
Farmington, NM 87499

Prepared by
Barr Engineering Co.

September 2025

4801 North Butler, Suite 15101
Farmington, NM 87401
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Threatened and Endangered Species Survey

No Name Permit Project

September 2025

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Abbreviations

BARR	Barr Engineering Co.
CFR	Code of Federal Regulations
GPS	global positioning system
NNC	Navajo Nation Code
NNDFW	Navajo Nation Department of Fish and Wildlife
NNHP	Navajo Nation Heritage Program
NTEC	Navajo Transitional Energy Company
OSMRE	Office of Surface Mining Reclamation and Enforcement
PAP	permit application package
SMCRA	Surface Mining Control and Reclamation Act of 1977
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction

Navajo Transitional Energy Company (NTEC) is preparing a permit application package (PAP) for submittal to the Office of Surface Mining Reclamation and Enforcement (OSMRE) to extend its Navajo Mine mining permit on the Navajo Nation in San Juan County, New Mexico. NTEC contracted Barr Engineering Co. (Barr) to survey for threatened and endangered species and update the 2008 surveys. The No Name permit boundary is within Navajo Mine Areas 4 South and 5 of the existing lease. The purpose of the surveys was to adhere to the Endangered Species Act of 1973, as amended (16 United States Code 1531 et seq.), the Navajo Nation code requirement for species of concern (17 NNC 507) 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 Code of Federal Regulations 780.16).

This report outlines the data collection and methodologies implemented for inventorying the permit area and the survey results. The methodologies are consistent with U.S. Fish and Wildlife Service (USFWS) and NNDFW guidelines and requirements. This report updates the 2008 *Threatened and Endangered Species Survey, Navajo Mine Extension Project* (Ecosphere 2008).

2 Project Area

2.1 Location

The No Name permit area (Areas 4 South and 5) is approximately 25 miles southwest of Farmington, New Mexico (Appendix A, Map 1). The No Name permit area encompasses approximately 11,526 acres in Area 4 South and 5. It is found on the Newcomb NE, and the Pillar NW, New Mexico 7.5-minute U.S. Geological Survey (USGS) quadrangles (Appendix A, Map 2).

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, which has shallow soils, steep hills, and rock outcrops. Although Pinabete and No Name arroyos intersect this area, the drainages are dry much of the summer. The only standing surface water present within the boundaries of the project area is found in several 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 comprises Great Basin desert-scrub habitat (Dick-Peddie 1993). Great Basin desert-scrub habitat is a cold desert ecosystem dominated by various shrubs with a sparse understory of forbs and grasses, with bare ground dominating in poor, alkaline soils (Fitzgerald et al. 1994; Dick-Peddie 1993). Many of the more than 160 plant species identified in this area are present in two or more plant communities (Ecosphere 2004a, 2004b, 2008). Each vegetation community type contains a few distinguishing or unique plant species. These six vegetation communities are briefly described below.

2.3.1 Dunes

The deep sands in this community 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 community can vary from saline to calcareous. The Sands habitat often transitions to and can be mixed with Thin Breaks habitat. In years with high 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 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, and snakeweed (*Gutierrezia sarothrae*).

2.3.4 Alkali Wash

Alkali Wash is associated with minor waterways. These areas are typically broad and level with occasional small, dense patches of galleta grass and alkali sacaton. Alkali Wash is typically located in and along washes and drainages, as well as at the base of the Badlands. Terrain is nearly level to moderately sloping, ranging from 0 to 3 percent. Other plants that are common in Alkali Wash include tansy mustard, Russian thistle, scorpion weed, mound saltbush (*Atriplex obovata*), 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 more water to run off and accumulate in crevices or fissures between rocks. Thin Breaks plant species found in these fissures include Russian thistle, tansy mustard, cryptantha, shadscale (*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 powellii* var. *powellii*), mound saltbush, annual Townsend daisy, stickseed, woolly plantain, salty buckwheat

(*Stenogonum salsuginosum*), Gordon's buckwheat (*Eriogonum gordonii*), scorpion weed, and globemallow.

3 Methods

3.1 Pre-Field Surveys

Barr biologists compiled an updated list of USFWS- and NNHP-listed species that occur or have the potential to occur in or near the project area. We obtained data from the Information for Planning and Consultation system and through consultation with the NNHP. According to USFWS, five threatened and endangered species and two proposed species have the potential to occur in the project area.

Navajo Natural Heritage Program 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. Group 1 species are those species or subspecies that no longer occur in the Navajo Nation. Group 2 species are considered endangered, or a species or subspecies whose prospects of survival or recruitment on the Navajo Nation are in jeopardy. Group 3 represents a species whose prospects of survival or recruitment will likely be in jeopardy in the foreseeable future. Group 4 species are those for which the NNDFW does not currently have sufficient information to support being listed as Group 2 or Group 3, but has reason to consider them. The NNHP currently has six records of species occurring within 1 mile to 3 miles of the permit area and lists four species with the potential to occur in the area encompassed by the Newcomb NE and The Pillar NW, New Mexico, 7.5-minute quadrangle maps (Appendix B).

Table 3-1 presents species currently identified by the agencies that do not have the potential to occur in the project area. These species are eliminated from further consideration. The USFWS and NNHP species lists are in Appendix B.

Table 3-1. Special Status Species Eliminated from Further Consideration

Species	Status	Habitat Associations	Rationale for Elimination
Mammals			
Black-foot ferret (<i>Mustela nigripes</i>)	Federal E Group 1	Occupies medium to large prairie dog towns greater than 8 hectares in size with 20 or more burrows per hectare.	This species is unlikely to occur in the permit area since it is well outside the population's current distribution. The permit area lacks sufficient prairie dog burrows to support this species.
Banner-tailed kangaroo rat (<i>Dipodomys spectabilis</i>)	Group 4	Great Basin desert grassland or desert scrub with heavier soils.	The Group 4 status for this species applies only to the populations in Arizona (NNHP 2020).

Species	Status	Habitat Associations	Rationale for Elimination
Birds			
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Federally Endangered, Group 2	Occurs in dense riparian habitats along streams, rivers, and other wetlands. Habitat types for this species include native broadleaf riparian, monotypic exotic, and mixed exotic/native broadleaf. It prefers very dense mid-story riparian vegetation stands at least 30 feet wide.	No riparian habitats in the permit area.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federally Threatened, Group 2	Breeds in riparian woodlands with developed canopies and dense understory vegetation, greater than 12.3 acres in size.	No riparian woodlands in the permit area.
Fish			
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	Federally Endangered, Group 2	Occurs in large rivers with strong currents, deep pools, and quiet backwaters.	No rivers occur in the permit area.
Razorback sucker (<i>Xyrauchen texanus</i>)	Federally Endangered, Group 2	Occurs in medium to large rivers with silty to rocky substrates. Prefers strong currents and deep pools.	No rivers occur in the permit area.
Insects			
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	Occurs throughout New Mexico during the warm season but is most abundant in southeast New Mexico. For reproduction, it exploits large milkweed populations during summer. Habitat is generally mesic or wet areas supporting milkweed or other nectar species.	No large areas of milkweed or nectar species in the permit area. No mesic or wet areas in the permit area.
Suckley's cuckoo bumble bee (<i>Bombus suckleyi</i>)	Proposed Endangered	A generalist nectar forager with meadows, grasslands, and developed areas providing important foraging habitat.	No abundant nectar resources in the permit area. This species has not been recorded as occurring in New Mexico.

Biologists reviewed available aerial imagery, species accounts, previous surveys, and geographic information system (GIS) data to determine the potential for occurrence of USFWS and NNHP-listed species within the proposed No Name permit area.

3.2 Designated or Proposed Critical Habitat

No designated or proposed critical habitats for federally listed species are within the permit area. Using geographic information system software, a search of designated critical habitats near the project area was performed. The nearest designated critical habitat for the Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*) is approximately 18 miles north of the proposed action.

3.3 Wildlife Areas

The NNDFW is responsible for managing and protecting the Navajo Nation's fish, wildlife, plants, and their habitats and has established wildlife habitat, sensitive areas, and associated Biological Resource Land Use Clearance Policies and Procedures. There are six wildlife area classifications mapped on the Navajo Nation. The project area occurs in an area designated as Area 2 – Moderately Sensitive Area and Area 3 – Less Sensitive Area.

3.3.1 Area 2 – Moderate Sensitive Areas

Moderate sensitive areas are those with a high concentration of rare, endangered, sensitive, and game species occurrences, or areas with a high potential for these species to occur throughout the landscape. The purpose of Area 2 is to minimize impacts to these species and their habitats and to ensure that the habitats in Area 1 do not become fragmented.

Development in Area 2 is required to be placed to avoid Navajo Endangered Species List (NESL) species and their habitats. Avoidance includes an adequate buffer to address long-term and cumulative impacts and will depend on the species and the type of development.

3.3.2 Area 3 – Less-Sensitive Areas

Less Sensitive Areas contain low or fragmented concentrations of sensitive-status species. These species may occur on the landscape in “islands” of well-spaced habitat that are limited in number on the landscape. Additionally, lands considered Less Sensitive may not be surveyed entirely for potential occurrences of sensitive-status species or habitat.

3.4 Species-Specific Field Surveys

Species-specific surveys were conducted during the 2025 field season and are summarized below. Surveys were conducted in the permit area using USFWS and NNDFW species-specific guidelines and in accordance with accepted scientific standards or guidelines (NNHP 2020). Previous threatened and endangered species surveys were reviewed in the mine lease area. We evaluated the methods used and species detected (TRC Mariah 1999, Ecosphere 2008) to develop a plan for efficient and thorough survey strategies. Barr used our knowledge of the area, biological expertise, and experience with the survey methods for these target species.

3.4.1 Burrowing Owl

Burrowing owls (*Athene cunicularia*) typically use burrows made by fossorial mammals, namely prairie dogs (*Cynomys gunnisoni*), but also ground squirrels (*Sciuridae* sp.) or badgers (*Taxidea taxus*) (Henny and Blus 1981). Therefore, we conducted surveys for burrowing owls in conjunction with mapping and describing prairie dog towns within the permit area and recorded observations during other wildlife or flora surveys. We conducted surveys in pairs by walking parallel 100-foot-wide transects with high-powered

binoculars through suitable habitat. Locations of potential nest burrows or burrowing owls were digitally recorded using a handheld sub-meter global positioning system (GPS) unit.

3.4.2 Ferruginous Hawk and Golden Eagle

Barr conducted initial ground-based surveys of historic raptor nests and ferruginous hawk (*Buteo regalis*) territories on April 14, 15, 16, 17, and 18, 2025. Follow-up surveys were conducted on June 3, 5, and 6, 2025. Aerial surveys are conducted within the 1-mile mine lease buffer every 3 years per NTEC's mine permit. The last aerial flight of the project area was completed in 2024. No additional ferruginous hawk and golden eagle (*Aquila chrysaetos*) surveys beyond annual monitoring were conducted. Barr biologists used binoculars and hand-held GPS units to locate and record raptor nest locations and determine the status of those nests, if possible. Location data were recorded in North American Datum (NAD) 1983 Universal Transverse Mercator (UTM). At the request of NTEC, data are converted to NAD 27 State Plane New Mexico West using ArcGIS software after surveys are completed.

3.4.3 Kit Fox

Spotlight surveys were conducted in the permit area in 2008 (Ecosphere 2008). Barr did not conduct additional spotlight surveys for kit fox (*Vulpes macrotis*) in 2025, as the species is known to occur within and adjacent to the No Name permit area. Kit fox, or signs thereof, have been regularly observed over the last 5 years during annual summer and winter wildlife surveys conducted for Navajo Mine (Barr 2023, 2024; Ecosphere 2019, 2021, 2022a, 2022b).

3.4.4 Mesa Verde Cactus

In 2025, during annual raptor monitoring, Barr biologists identified a new population of Mesa Verde cactus (*Sclerocactus mesae-verdae*) within the 1-mile buffer of the No Name permit area. Using a desktop analysis, the potential Mesa Verde cactus habitat was identified within the permit area. Biologists ground-truthed the habitat using vehicular or pedestrian surveys. Approximately 846 acres of potential Mesa Verde cactus habitat were identified within the No Name permit boundary.

Pedestrian field surveys were conducted within the potential Mesa Verde cactus habitat on May 27, 28, 29, and 30, 2025. Before conducting fieldwork, GIS data delineating the survey area boundaries were loaded onto handheld GPS units capable of recording data to sub-meter accuracy. Surveys were conducted by qualified biologists experienced with identifying Mesa Verde cactus and suitable habitat using parallel pedestrian transects spaced 10 feet apart within identified potential habitat.

3.4.5 Mountain Plover

In 2025, surveys for the mountain plover (*Charadrius montanus*) were conducted in locations where the species was recorded in 2008 (Ecosphere 2008). Mountain plover surveys are not conducted annually within the mine lease. While the species has been recorded incidentally in the permit area, it has not been observed nesting.

3.4.6 Prairie Dog Colonies

Prairie dog colonies are surveyed annually in September within the mine lease using a systematic approach to identify functional prairie dog burrows. Functional burrows are structurally suitable to house prairie dogs—they are entirely open, are only partially filled with dirt, or are open but are blocked by sticks, weeds, cobwebs, or other debris. They can be either occupied or unoccupied. Occupied and

unoccupied burrows were included, as prairie dog towns can shift (depending on resource availability) and old towns can be recolonized over time. Non-functional burrows (i.e., burrows with an opening of less than 3 inches or those filled with dirt) were not recorded. Each colony's status (occupied or unoccupied) was documented based on visual observations such as prairie dogs seen or heard, or recent prairie dog activity (e.g., fresh digging, scat, tracks).

Previously mapped prairie dog towns were located using a handheld GPS unit. Biologists walked within and along the perimeter of each mapped prairie dog town, marking burrows using the GPS unit. If a burrow was outside the established perimeter, the biologist moved in the direction of the new burrow to determine if it was part of the established town or in a new town. If a burrow was more than 750 feet from the last known burrow, it was not considered part of the previously mapped town, and a new town was delineated. If burrows were not observed within 750 feet of the last known burrow, the biologist returned to the previous burrow location to continue the validation and re-delineation of the perimeter until the entire prairie dog town was mapped.

A 375-foot buffer around burrows (half the distance used to delineate different towns) was used to map the town's boundary using a geographic information system.

3.4.7 San Juan Milkweed

In 2008, San Juan milkweed (*Asclepias sanjuanensis*) was encountered at six widely dispersed locations in the permit area. In 2025, biologists revisited the 2008 San Juan milkweed occurrences and surveyed suitable habitat in the Dunes vegetation community. Pedestrian field surveys were conducted on June 11, 12, and 13, using parallel pedestrian transects spaced 15 feet apart. An intensive inventory of the permit area was not conducted.

4 Results

4.1.1 Burrowing Owl

No federal, state, or Navajo Nation protections exist for this species, and the Navajo Nation does not have sufficient information to support its threatened or endangered status on the NESL.

Burrowing owls are small, buff-colored owls that are typically active during the day (NNHP 2020). Burrowing owls are found throughout the western U.S (Poulin et al. 2011). This owl inhabits level, open areas in heavily grazed or low-stature desert vegetation. On the Navajo Nation, this species occurs in dry, open grasslands or desert scrub, but grassland with sparse junipers may also be used (NNHP 2020). This species does not create its burrows; consequently, suitable habitat must have available burrows. Burrowing owls use abandoned burrows of prairie dogs, kangaroo rats (*Dipodomys* sp.), badgers (*Taxidea taxus*), and foxes (*Vulpes* sp.) for nesting and escape cover (Poulin et al. 2011).

In June 2025, biologists observed one burrowing owl nest in the Badland vegetation community in the permit area. We identified several burrowing owls within a prairie dog colony in Area 5. The success of this nest was not determined.

4.1.2 Ferruginous Hawk and Golden Eagle

The golden eagle nests on steep cliffs, usually over 100 feet tall, and forages in surrounding shrublands and grasslands (NNHP 2020). Typically, this species avoids heavily forested areas. The golden eagle feeds on black-tailed jackrabbits and other small mammals (Kochert et al. 2002).

Ferruginous hawks occur year-round throughout the southwest, inhabiting dry, flat, or rolling grasslands and desert scrub. This species often prefers elevated nest sites on rock pinnacles, buttes, or short cliffs. Nests have also been documented in juniper trees, transmission line towers, and on the ground (NNHP 2020).

In 2025, Barr biologists visited three historical golden eagle nests (#986, #908, #907). All of these nests were determined to be inactive. Nest #986 was active in 2024, had one fledgling, and was determined to be successful. Nest #907 has not been active in more than 10 years. Nest #908 historically was a golden eagle nest, but more recently has been occupied by a red-tailed hawk (*Buteo jamaicensis*). Nest #908 was last active in 2017 and 2018. Golden eagles were incidentally observed twice during surveys in the No Name permit area in 2025.

4.1.3 Kit Fox

There are no federal, state, or Navajo Nation protections for this species, and the Navajo Nation does not currently have sufficient information to support its listing as threatened or endangered on the NESL.

Kit fox are distributed throughout northern Mexico, southern Idaho and Oregon, and the southwestern United States, including Arizona, Colorado, California, Utah, and New Mexico. On the Navajo Nation, kit foxes are found east of the Chuska Mountains and Chinle Valley in Arizona and Utah (NNHP 2020).

In 2008, two kit fox dens were recorded, one in the permit area and one within the 1-mile buffer. No spotlighting or kit fox species-specific surveys were conducted in 2025. The species, or signs thereof, are regularly observed in the No Name permit area. No fox dens were incidentally observed. This highly mobile species may change den sites over time.

4.1.4 Mesa Verde Cactus

The Mesa Verde cactus is a federally listed threatened species. This species has gray-green to pale green stems that are depressed-globose to oval in shape and typically produces yellowish-cream flowers from late April to early May, although extreme southern populations tend to produce pink flowers. Stems are low growing and 1.5 to 3.1 inches in diameter (Heil and Porter 1994), but large mature individuals can reach up to 7.5 inches in diameter (USFWS 2011; Roth 2020).

Mesa Verde cactus is typically found on or near clay hills associated with the Fruitland and Mancos Shale geological formations at elevations ranging from 4,900 to 5,500 feet (Heil and Porter 1994). A small portion of the habitat is near the Hogback and is characterized by highly sodic, fluvial soils containing selenite gypsum (Roth 2020). Soil surfaces within appropriate habitat can have a cover of gravel or cobbles ranging from up to 100 percent. However, appropriate Mesa Verde cactus habitat is related to the underlying clay soil and is independent of any overlying cover of cobbles or gravel (Roth 2020).

A small population of Mesa Verde cactus was recorded within the 1-mile buffer of the No Name permit area. The population contained four live cacti and one dead cactus. No other Mesa Verde cacti were recorded within the suitable habitat identified within the permit area.

4.1.5 Mountain Plover

The mountain plover breeds in flat, open grasslands and is often associated with prairie dog towns and intensive grazing (NNHP 2020). In May 2007, mountain plovers were observed during vegetation and breeding bird surveys (Ecosphere 2008). No federal, state, or Navajo Nation protections exist for this species. The Navajo Nation does not have sufficient information to support this species being listed as threatened or endangered on the NESL.

No protocol or species-specific surveys were conducted in 2025. Previous mountain plover locations from 2008 were revisited, and no mountain plovers were observed. However, surveys for mountain plovers were done in late June and July, which is late in the season for this species.

4.1.6 Prairie Dog Colonies

Five major prairie dog colonies were documented in the No Name permit area in 2008. The towns ranged in size from 75 to 317 acres and totaled 708 acres (Ecosphere 2008).

Prairie dogs (*Cynomys* sp.) serve as keystone species for sensitive raptors and other wildlife, and their towns often fluctuate in size. Because of this, prairie dog surveys and annual mapping of colonies in the Navajo Mine lease began in September 2012. The large prairie dog colonies identified in the No Name permit area in 2008 have not been surveyed since and considered dormant.

In 2025, Barr biologists revisited the historic colonies and discovered active prairie dogs. Table 4-1 lists the location and size of the prairie dog colonies recorded in 2025 in the No Name permit area. While these areas are not as large as recorded in 2008, they may reflect a resurgence in Area 5 since annual monitoring has not identified them as active.

Table 4-1. Prairie Dog Colonies Mapped in the No Name Permit Area

Location	Size (acres)
Area 5	17.4
Area 5	34.8
Area 5	24.4
Total	76.6

4.1.7 San Juan Milkweed

There are no federal, state, or Navajo Nation protections for this species, and the Navajo Nation does not currently have sufficient information to support its listing as threatened or endangered on the NESL.

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 permit area, this species occurs in the Dunes and Sands vegetation communities.

In 2025, biologists revisited San Juan milkweed locations in the No Name permit area and recorded 150 individuals in 7 populations. The surveys focused on the Dunes vegetation community, as the 2008 report identified it as suitable habitat. However, the species was also found in the Sands vegetation community. It's likely that San Juan milkweed is more widespread in the permit area, as a complete inventory was not conducted in 2025.

5 Conclusions and Recommendations

Federal and tribal special status species lists have changed since 2008. In 2025, no spotlighting, breeding bird surveys, or mountain plover surveys were conducted to update the 2008 data since existing data were deemed to be sufficient.

In 2025, Barr biologists observed burrowing owls nesting in the No Name permit area. Historic ferruginous hawk and golden eagle nests were not active. No kit fox dens were observed, but species-specific surveys were not conducted. Kit fox are known to regularly use the permit area. No mountain plovers were observed, and it has been more than 5 years since they were recorded within the overall mine lease. Prairie dog colonies previously inactive were determined to be active, though small in size.

A small Mesa Verde cactus population was recorded within the 1-mile buffer of the No Name permit area, but no individuals were identified within the permit area. San Juan milkweed tends to be widely distributed in the Dunes vegetation community and may also be found in the Sands vegetation community.

Further surveys and monitoring may be needed pending recommendations from NNHP or OSMRE. NTEC annually monitors wildlife on the entire mine lease. The results of these efforts are generally consistent with previous years, and no marked changes in species observed, total observations, or the typical size of prairie dog towns have been detected.

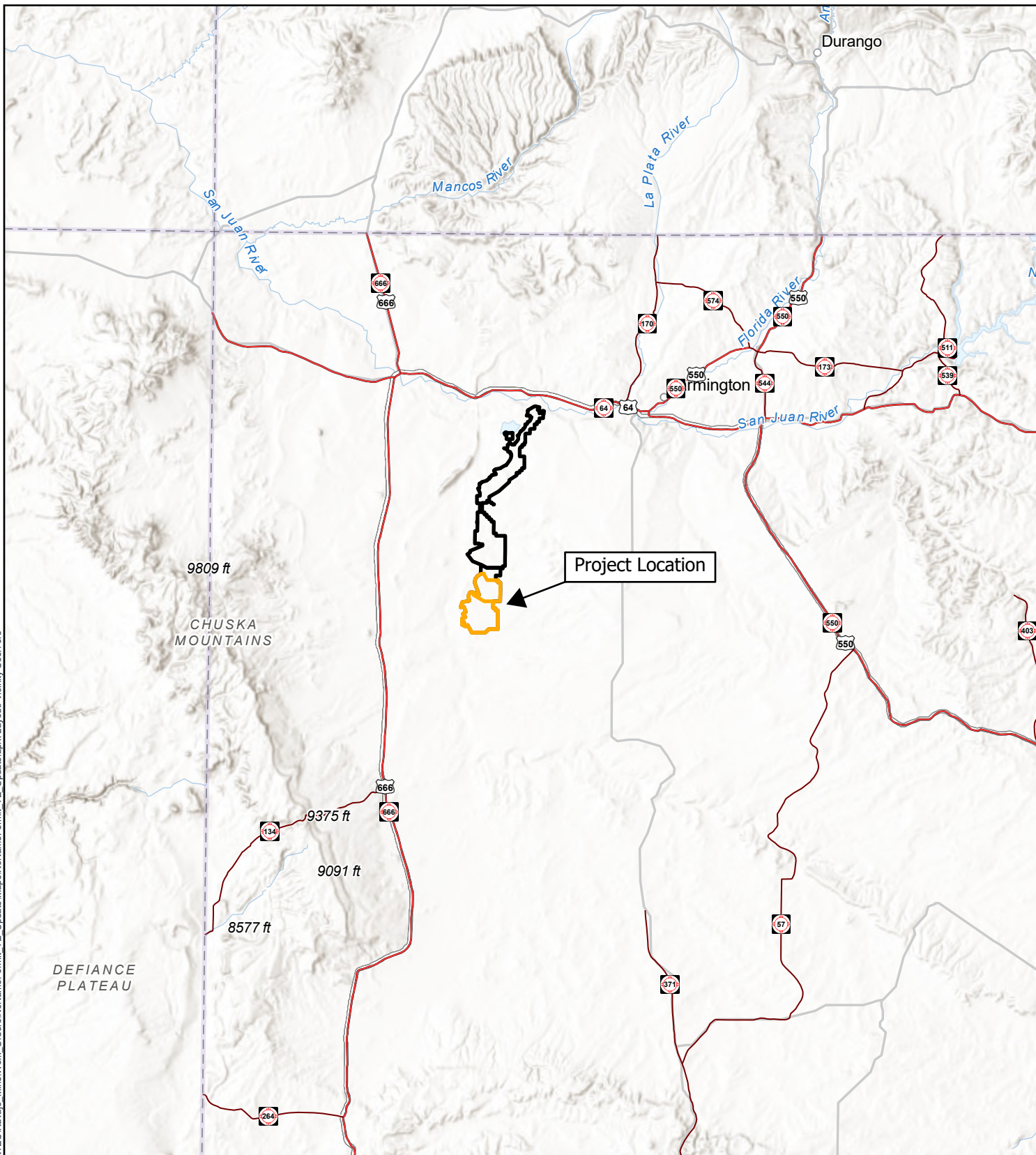
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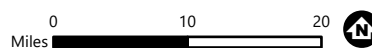


Appendix A

Maps



-  No Name Permit Boundary
-  Navajo Mine Lease Boundary
-  Interstate
-  U.S. Highway
-  State Route



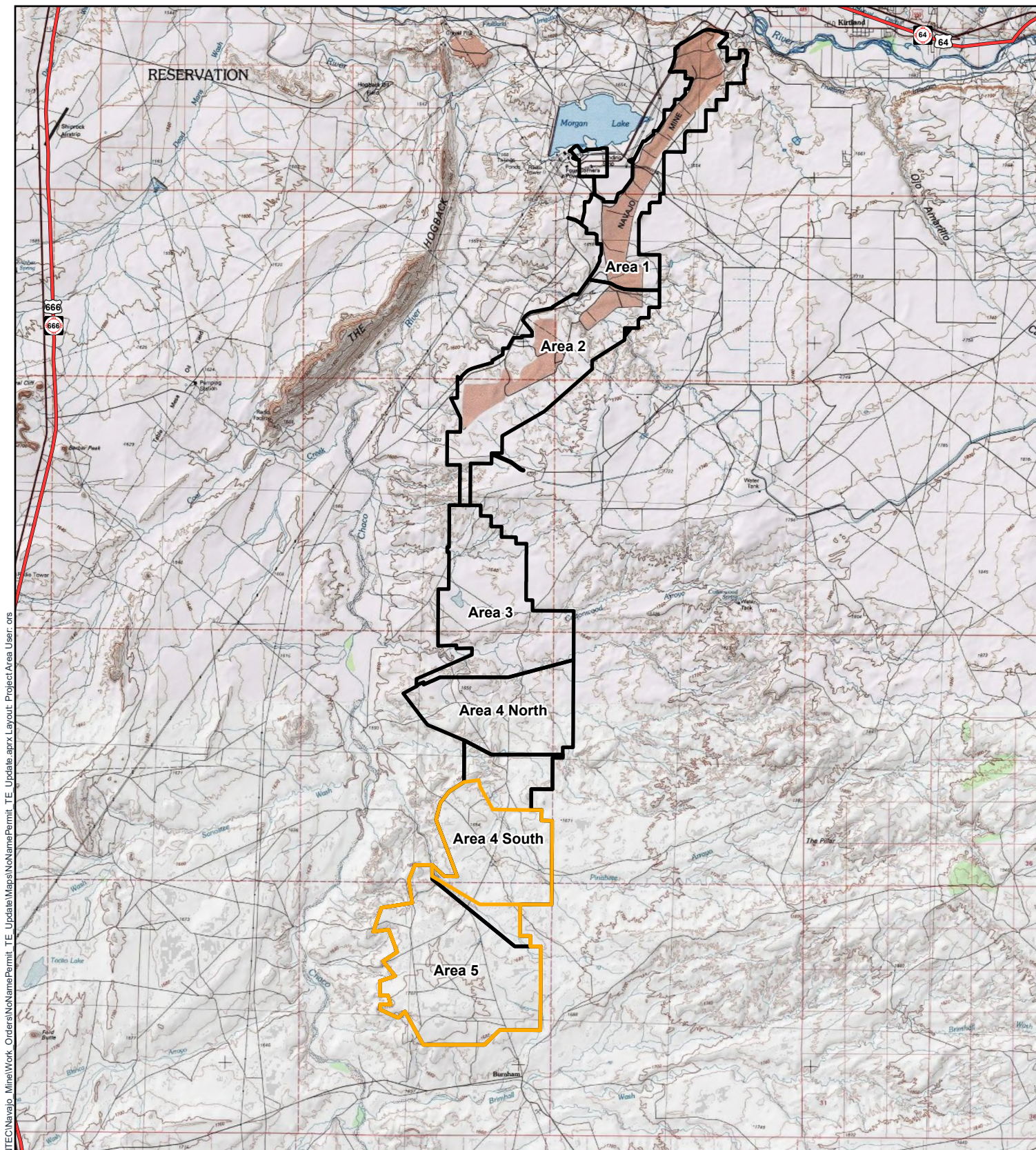
Sources: NTEC, ESRI, Barr

Navajo Transitional Energy Company

No Name Permit
Threatened and Endangered
Species Surveys

Vicinity



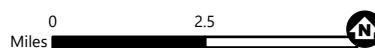


- No Name Permit Boundary
- Navajo Mine Mining Areas
- U.S. Highway

Navajo Transitional Energy Company

No Name Permit
Threatened and Endangered
Species Surveys

Project Area





Appendix B

Species Lists



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542



In Reply Refer To:

06/04/2025 15:07:21 UTC

Project Code: 2025-0105272

Project Name: No Name Permit Application

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 *et seq.*), the Migratory Bird Treaty Act as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act as amended (16 USC 668-668(c)). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area, and to recommend some conservation measures that can be included in your project design.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the ESA is to provide a means whereby threatened and endangered species and

the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA; 42 USC 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico State agencies. These lists, along with species information, can be found at the following websites.

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program:
<https://www.emnrd.nm.gov/sfd/rare-plants/>

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmrareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html, integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

In addition to responsibilities to protect threatened and endangered species under the ESA, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 CFR 10.12 and 16 USC 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a Federal nexus) or a Bird/Eagle Conservation Plan (when there is no Federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>. We also recommend review of the Birds of Conservation Concern list (<https://www.fws.gov/media/birds-conservation-concern-2021>) to fully evaluate the effects to the birds at your site. This list identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent top conservation priorities for the Service, and are potentially threatened by disturbance, habitat impacts, or other project development activities.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 thereby provides additional protection for both migratory birds and migratory bird habitat. Please visit <https://www.fws.gov/partner/council-conservation-migratory-birds> for information regarding the implementation of Executive Order 13186.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State protected and at-risk species fish, wildlife, and plants.

For further consultation with the Service we recommend submitting inquiries or assessments electronically to our incoming email box at nmesfo@fws.gov, where it will be more promptly routed to the appropriate biologist for review.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office

2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

PROJECT SUMMARY

Project Code: 2025-0105272

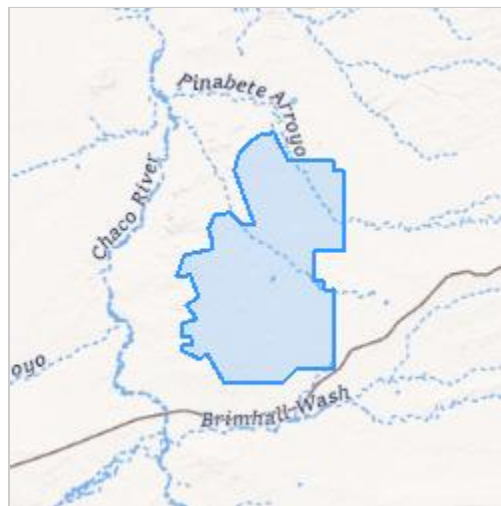
Project Name: No Name Permit Application

Project Type: Subsurface Exploration - Coal

Project Description: Navajo Transitional Energy Company is seeking to submit a permit application package to the Office of Surface Mining Reclamation and Enforcement to permit the No Name area within their existing Navajo Mine lease. The permit area comprises about 13,006 acres in BNCC lease Areas 4 South and 5. The No Name permit area is located about 20 miles southwest of Farmington, New Mexico and is found on the Hogback S, Newcomb NE, and The Pillar W, New Mexico 7.5-minutes U.S. Geological Survey quadrangles

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@36.42370215,-108.529660097799,14z>



Counties: San Juan County, New Mexico

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

FISHES

NAME	STATUS
Colorado Pikeminnow <i>Ptychocheilus lucius</i> Population: Wherever found, except where listed as an experimental population There is final critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. Effects of water depletions must be considered even outside of occupied range. Species profile: https://ecos.fws.gov/ecp/species/3531	Endangered
Razorback Sucker <i>Xyrauchen texanus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. Effects of water depletions must be considered even outside of occupied range. Species profile: https://ecos.fws.gov/ecp/species/530	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee <i>Bombus suckleyi</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

FLOWERING PLANTS

NAME	STATUS
Mesa Verde Cactus <i>Sclerocactus mesae-verdae</i> No critical habitat has been designated for this species.	Threatened

NAME

STATUS

Species profile: <https://ecos.fws.gov/ecp/species/6005>

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Joey Herring
Address: 4801 N. Butler
City: Farmington
State: NM
Zip: 87401
Email: jherring@barr.com
Phone: 5053200101

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Office of Surface Mining Reclamation and Enforcement



PO BOX 1480
Window Rock, AZ 86515

P 928.871.6472 / F 928.871.7603

www.nndfw.org

25barr103
20-June-2025

Joey Herring
Barr Engineering, Co.
4801 N. Butler, Suite 15101
Farmington, NM 87401
505-320-0101
jherring@barr.com

SUBJECT: Navajo Transitional Energy Company No Name Permit Application

Joey Herring,

NNHP has performed an analysis of your project in comparison to known biological resources of the Navajo Nation and has included the findings in this letter. The letter is composed of seven parts. The sections as they appear in the letter are:

1. **Known Species** – a list of all species within relative proximity to the project
2. **Potential Species** – a list of potential species based on project proximity to respective suitable habitat
3. **Quadrangles** – an exhaustive list of quads containing the project
4. **Project Summary** – a categorized list of biological resources within relative proximity to the project grouped by individual project site(s) or quads
5. **Conditional Criteria Notes** – additional details concerning various species, habitat, etc.
6. **Personnel Contacts** – a list of employee contacts
7. **Resources** – identifies sources for further information

Known Species lists “species of concern” known to occur within proximity to the project area. Planning for avoidance of these species is expected. If no species are displayed then based upon the records of the Navajo Nation Department of Fish and Wildlife (NNDFW) there are no “species of concern” within proximity to the project. Refer to the Navajo Endangered Species List (NESL) Species Accounts for recommended avoidance measures, biology, and distribution of NESL species on the Navajo Nation (https://www.nndfw.org/nnhp/sp_account.htm).

Potential Species lists species that are potentially within proximity to the project area and need to be evaluated for presence/absence. If no species are found within the Known or Potential Species lists, the project is not expected to affect any federally listed species, nor significantly impact any tribally listed species or other species of concern. Potential for species has been determined primarily on habitat characteristics and species range information. A thorough habitat analysis, and if necessary, species specific surveys, are required to determine the potential for each species.

Species of concern include protected, candidate, and other rare or otherwise sensitive species, including certain native species and species of economic or cultural significance. For legally protected species, the following tribal and federal statuses are indicated: NESL, federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Eagle Protection Act (EPA). No legal protection is afforded species with only ESA candidate, NESL group 4 status, and species listed on the Sensitive Species List. Please be aware of these species during surveys and inform the NNDFW of observations. Reported observations of these species and documenting them in project planning and management is important for conservation and may contribute to ensuring they will not be up listed in the future.

In any and all correspondence with NNDFW or NNHP concerning this project please cite the Data Request Code associated with this document. It can be found in this report on the top right corner of every page. Additionally please cite this code in any biological evaluation documents returned to our office.

1. Known Species *(NESL=Navajo Endangered Species List, FE=Federally Endangered, FT=Federally Threatened, FC=Federal Candidate)*

Species

AQCH = Aquila chrysaetos / Golden Eagle NESL G3
 ASSA = Asclepias sanjuanensis / San Juan Milkweed NESL G4
 ATCU = Athene cunicularia / Burrowing Owl NESL G4
 BURE = Buteo regalis / Ferruginous Hawk NESL G3
 CHMO = Charadrius montanus / Mountain Plover NESL G4
 DISP = Dipodomys spectabilis / Banner-tailed Kangaroo Rat NESL G4

All or parts of this project currently are within Ferruginous Hawk Guideline Areas; consult with NNDFW zoologist or EA reviewer for more information and recommendations.

2. Potential Species

Species

AQCH = Aquila chrysaetos / Golden Eagle NESL G3
 ASSA = Asclepias sanjuanensis / San Juan Milkweed NESL G4
 ATCU = Athene cunicularia / Burrowing Owl NESL G4
 BURE = Buteo regalis / Ferruginous Hawk NESL G3
 CHMO = Charadrius montanus / Mountain Plover NESL G4
 EMTREX = Empidonax traillii extimus / Southwestern Willow Flycatcher NESL G2 FE
 MUNI = Mustela nigripes / Black-footed Ferret NESL G1 FE
 SCMEVE = Sclerocactus mesae-verdae / Mesa Verde Cactus NESL G2 FT
 VUMA = Vulpes macrotis / Kit Fox NESL G4

3. Quadrangles (7.5 Minute)

Quadrangles

Newcomb NE (36108-D5) / NM
 The Pillar NW (36108-D4) / NM

4. Project Summary *(EO1 Mile/EO 3 Miles=elements occurring within 1 & 3 miles., MSO=mexican spotted owl PACs, POTS=potential species, RCP=Biological Areas)*

SITE	EO1MI	EO3MI	QUAD	MSO	POTS	RCP
No Name Permit	AQCH, ASSA, ATCU, BURE, CHMO, DISP	AQCH, ASSA, ATCU, BURE, CHMO, DISP	Newcomb NE (36108-D5) / NM	None	AQCH, ASSA, ATCU, BURE, CHMO, EMTREX, MUNI, SCMEVE, VUMA	Area 2, Area 3
No Name Permit	ATCU, BURE, CHMO	ATCU, BURE, CHMO, DISP	The Pillar NW (36108-D4) / NM	None	AQCH, ASSA, ATCU, BURE, CHMO, MUNI, VUMA	Area 2, Area 3

5. Conditional Criteria Notes *(Recent revisions made please read thoroughly. For certain species, and/or circumstances, please read and comply)*

A. Biological Resource Land Use Clearance Policies and Procedures (RCP) - The purpose of the RCP is to assist the Navajo Nation government and chapters ensure compliance with federal and Navajo laws which protect, wildlife resources, including plants, and their habitat resulting in an expedited land use clearance process. After years of research and study, the NNDFW has identified and mapped wildlife habitat and sensitive areas that cover the entire Navajo Nation.

The following is a brief summary of six (6) wildlife areas:

1. **Highly Sensitive Area** – recommended no development with few exceptions.
2. **Moderately Sensitive Area** – moderate restrictions on development to avoid sensitive species/habitats.
3. **Less Sensitive Area** – fewest restrictions on development.
4. **Community Development Area** – areas in and around towns with few or no restrictions on development.
5. **Biological Preserve** – no development unless compatible with the purpose of this area.
6. **Recreation Area** – no development unless compatible with the purpose of this area.

None - outside the boundaries of the Navajo Nation

This is not intended to be a full description of the RCP please refer to the our website for additional information at <https://www.nndfw.org/clup.htm>.

B. Raptors – If raptors are known to occur within 1 mile of project location: Contact the NNHP zoologist at 871-7070 regarding your evaluation of potential impacts and mitigation.

Golden and Bald Eagles- If Golden or Bald Eagle are known to occur within 1 mile of the project, decision makers need to ensure that they are not in violation of the *Golden and Bald Eagle Nest Protection Regulations* found at https://www.nndfw.org/nnhp/docs_reps/gben.pdf.

Ferruginous Hawks – Refer to *Navajo Nation Department of Fish and Wildlife's Ferruginous Hawk Management Guidelines for Nest Protection* (https://www.nndfw.org/nnhp/docs_reps.htm) for relevant information on avoiding impacts to Ferruginous Hawks within 1 mile of project location.

Mexican Spotted Owl - Please refer to the *Navajo Nation Mexican Spotted Owl Management Plan* (https://www.nndfw.org/nnhp/docs_reps.htm) for relevant information on proper project planning near/within spotted owl protected activity centers and habitat.

C. Surveys – Biological surveys need to be conducted during the appropriate season to ensure they are complete and accurate please refer to NN Species Accounts https://www.nndfw.org/nnhp/sp_account.htm. Surveyors on the Navajo Nation must be permitted by the Director, NNDFW. Contact Jeff Cole at (928) 871-6450 for permitting procedures. Questions pertaining to surveys should be directed to the NNDFW the NNHP Zoologist for animals, and the NNHP Botanist for plants. Questions regarding biological evaluation should be directed to Jeff Cole at 871-6450.

D. Oil/Gas Lease Sales – Any settling or evaporation pits that could hold contaminants should be lined and covered. Covering pits, with a net or other material, will deter waterfowl and other migratory bird use. Lining pits will protect ground water quality.

E. Power line Projects – These projects need to ensure that they do not violate the regulations set forth in the *Navajo Nation Raptor Electrocution Prevention Regulations* found at https://www.nndfw.org/nnhp/docs_reps/repr.pdf.

F. Guy Wires – Does the project design include guy wires for structural support? If so, and if bird species may occur in relatively high concentrations in the project area, then guy wires should be equipped with highly visual markers to reduce the potential mortality due to bird-guy wire collisions. Examples of visual markers include aviation balls and bird flight diverters. Birds can be expected to occur in relatively high concentrations along migration routes (e.g., rivers, ridges or other distinctive linear topographic features) or where important habitat for breeding, feeding, roosting, etc. occurs. The U.S. Fish and Wildlife Service recommends marking guy wires with at least one marker per 100 meters of wire.

G. San Juan River – On 21 March 1994 (Federal Register, Vol. 59, No. 54), the U.S. Fish and Wildlife Service designated portions of the San Juan River (SJR) as critical habitat for *Ptychocheilus lucius* (Colorado pikeminnow) and *Xyrauchen texanus* (Razorback sucker). Colorado pikeminnow critical habitat includes the SJR and its 100-year floodplain from the State Route 371 Bridge in T29N, R13W, sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian) up to the full pool elevation. Razorback sucker critical habitat includes the SJR and its 100-year floodplain from the Hogback Diversion in T29N, R16W, sec. 9 (New Mexico Meridian) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian). All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of critical habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

H. Little Colorado River - On 21 March 1994 (Federal Register, Vol. 59, No. 54) the U.S. Fish and Wildlife Service designated Critical Habitat along portions of the Colorado and Little Colorado Rivers (LCR) for *Gila cypha* (humpback chub). Within or adjacent to the Navajo Nation this critical habitat includes the LCR and its 100-year floodplain from river mile 8 in T32N R6E, sec. 12 (Salt and Gila River Meridian) to its confluence with the Colorado River in T32N R5E sec. 1 (S&GRM) and the Colorado River and 100-year floodplain from Nautuloid Canyon (River Mile 34) T36N R5E sec. 35 (S&GRM) to its confluence with the LCR. All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of Critical Habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include, but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

I. Wetlands – In Arizona and New Mexico, potential impacts to wetlands should also be evaluated. The U.S. Fish & Wildlife Service's National Wetlands Inventory (NWI) maps should be examined to determine whether areas classified as wetlands are located close enough to the project site(s) to be impacted. In cases where the maps are inconclusive (e.g., due to their small scale), field surveys must be completed. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. NWI maps are available for examination at the Navajo Natural Heritage Program (NNHP) office, or may be purchased through the U.S. Geological Survey (order forms are available through the NNHP). The NNHP has complete coverage of the Navajo Nation, excluding Utah, at 1:100,000 scale; and coverage at 1:24,000 scale in the southwestern portion of the Navajo Nation. In Utah, the U.S. Fish & Wildlife Service's National Wetlands Inventory maps are not yet available for the Utah portion of the Navajo Nation, therefore, field surveys should be completed to determine whether wetlands are located close enough to the project site(s) to be impacted. For field surveys, wetlands identification and delineation methodology contained in the "Corps of Engineers Wetlands Delineation Manual" (Technical Report Y-87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. For more information contact the Navajo Environmental Protection Agency's Water Quality Program.

J. Data Request – The information in this report was identified by the NNHP and NNDFW's biologists and computerized database, and is based on data available at the time of this response. It should not be regarded as the final statement on the occurrence of any species, nor should it substitute for on-site surveys. Also, because the NNDFW information is continually updated, any given information response is only wholly appropriate for its respective request.

K. Ground Water Pumping - Projects involving the ground water pumping for mining operations, agricultural projects or commercial wells (including municipal wells) will have to provide an analysis on the effects to surface water and address potential impacts on all aquatic and/or wetlands species listed below. NESL Species potentially impacted by ground water pumping: *Carex specuicola* (Navajo Sedge), *Cirsium rydbergii* (Rydberg's Thistle), *Primula specuicola* (Cave Primrose), *Platanthera zothecina* (Alcove Bog Orchid), *Puccinellia parishii* (Parish Alkali Grass), *Zigadenus vaginatus* (Alcove Death Camas), *Perityle specuicola* (Alcove Rock Daisy), *Symphyotrichum welshii* (Welsh's American-aster), *Coccyzus americanus* (Yellow-billed Cuckoo), *Empidonax traillii extimus* (Southwestern Willow Flycatcher), *Rana pipiens* (Northern Leopard Frog), *Gila cypha* (Humpback Chub), *Gila robusta* (Roundtail Chub), *Ptychocheilus lucius* (Colorado Pikeminnow), *Xyrauchen texanus* (Razorback Sucker), *Cinclus mexicanus* (American Dipper), *Speyeria nokomis* (Western Seep Fritillary), *Aechmophorus clarkia* (Clark's Grebe), *Ceryle alcyon* (Belted Kingfisher), *Dendroica petechia* (Yellow Warbler), *Porzana carolina* (Sora), *Catostomus discobolus* (Bluehead Sucker), *Cottus bairdi* (Mottled Sculpin), *Oxyloma kanabense* (Kanab Ambersnail)

6. Personnel Contacts

Wildlife Manager : Brent Powers (928) 871-7062 bpowers@nndfw.org

Zoologist : Vacant (928) 871-7070

Botanist : Shannon Lencioni slencioni@nndfw.org

Project Specialist : Kathleen Arviso (928) 871-6450 reviews@nndfw.org

GIS Supervisor : Dexter D Prall (928) 660-9169 prall@nndfw.org

7. Resources

Navajo Endangered Species List: <https://www.nndfw.org/nnhp/endangered.htm>

Species Accounts: https://www.nndfw.org/nnhp/sp_account.htm

Biological Investigation Permit Application: https://www.nndfw.org/nnhp/study_permit.htm

Navajo Nation Sensitive Species List: <https://www.nndfw.org/nnhp/trackinglist.htm>

Species Management Documents and/or Reports: https://www.nndfw.org/nnhp/docs_reps.htm

Consultant List: https://www.nndfw.org/docs/bi_consult_list_2024.pdf

Dexter D Prall, GIS Supervisor - Natural Heritage Program
Navajo Nation Department of Fish and Wildlife