APPENDIX D

BIOLOGICAL EVALUATION FOR PRE-2016 MINE PLAN FOR AREA III AND AREA IV NORTH

Ecosphere
Environmental Services

Biological Evaluation

Pre-2016 Mine Plan for Area IV North and Area III Navajo Mine

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For Submission to:
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October 2011

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ACRONYM LIST

afy	acre-feet per year
BA	biological assessment
BE	biological evaluation
BLM	Bureau of Land Management
BNCC	BHP Navajo Coal Company
BRCF	Biological Resources Compliance Form
CCB	coal combustion byproduct
CFR	Code of Federal Regulations
CWA	Clean Water Act
dB	decibel
dBA	A-weighted sound level
EA	environmental assessment
Ecosphere	Ecosphere Environmental Services
EP	extraction procedure
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCPP	Four Corners Power Plant
FFO	Farmington Field Office
IP	Individual Permit
km	kilometer
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
Lmax	maximum noise level
MBTA	Migratory Bird Treaty Act
mg/l	milligram per liter

MSGP	Multi-Sector General Permit
NAAQS	National Ambient Air Quality Standards
NAPI	Navajo Agriculture Projects Industry
NESL	Navajo Nation Endangered Species List
NM	New Mexico
NNDFW	Navajo Nation Department of Fish and Wildlife
NNHP	Navajo Nation Natural Heritage Program
NPDES	National Pollutant Discharge Elimination System
OSM	Office of Surface Mining
PHC	probable hydrologic consequences
PM	particulate matter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
PNM	Public Service Company of New Mexico
PSD	prevention of significant deterioration
RCRA	Resource Conservation and Recovery Act
RM	river mile
SIL	significant impact level
SLAMS	State and Local Air Monitoring Stations
SMCRA	Surface Mining Control and Reclamation Act
TDS	total dissolved solids
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service

1. INTRODUCTION

BHP Navajo Coal Company (BNCC) contracted Ecosphere Environmental Services (Ecosphere) to conduct a threatened and endangered species field survey and to prepare a biological evaluation (BE) associated with the current BNCC proposed Mine Plan Revision recently submitted to the Office of Surface Mining (OSM). The BE addresses potential impacts to federally listed species in much the same way that a biological assessment (BA) does, except it also addresses Navajo Nation listed species of concern. Because the impact determinations made in this document for federally listed species do not trigger formal consultation with the U.S. Fish and Wildlife Service (USFWS), the document is characterized as a BE rather than BA. The proposed Mine Plan Revision considers mining in Area IV North, continued mining in Areas II and III, and addresses operational activities such as coal transport, stockpiling, and reclamation in all active mine areas, including in Area I. Accordingly, this BE addresses all current and proposed mining activities at Navajo Mine.

As described in the Pre-2016 Mining in Area III and IV North Environmental Assessment (EA), the Proposed Action includes the following: (1) mining in Area IV North as described in the BNCC 2011 Mine Plan Revision submittal to the Office of Surface Mining (OSM), (2) construction of the Burnham Road Reroute, (3) continued mining in Area III, and (4) continued operational activities associated with moving the mined coal to the Four Corners Power Plant (FCPP). All of the activities proposed and evaluated in this BE have been subject to previous consultations with the USFWS, New Mexico Ecological Services, Navajo Nation Department of Fish and Wildlife (NNDFW), and the Navajo Nation Natural Heritage Program (NNHP).

1.1 Previous USFWS Consultations

OSM has completed six Endangered Species Act (ESA) section 7 consultations with the USFWS since the Life of Mine Permit for Navajo Mine was issued in 1988. Table 1-1 lists these consultations, three of which are 2-22-01-I-623 for the 2001 Dixon Pit Extension, 2-22-04-I-523b for the 2005 Area IV North Mine Plan Revision, and 2-22-94-I-529 for the 1994 Mine Permit Renewal considered actions and areas evaluated in this BE. Species evaluated in those consultations are all included and analyzed in this BE. Two species previously analyzed—the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus anatum*)—have since been delisted under the ESA. There have been no new species listed or any new critical habitat designations in San Juan County, New Mexico, including on or near Navajo Mine. The 2001 and 2005 consultations yielded the same affect determinations: “May affect not likely to adversely affect” for the southwestern willow flycatcher (*Empidonax traillii extimus*) and “No Effect” for all other species. The 1994 consultation concluded that the mining activities “will not adversely affect” any of the listed species.

In addition to the previous USFWS consultations, all federal actions at Navajo Mine are evaluated by the NNDFW in order to consider potential impacts to Navajo Nation listed sensitive species. A Biological Resources Compliance Form (BRCF) or a Fish and Wildlife Clearance Letter was also issued for all of the consultations listed in Table 1-1—indicating compliance with Tribal laws protecting biological resources.

Table 1-1 Consultations with USFWS Related to Navajo Mine since 1988.

Date Initiated by OSM	Action	Area Affected	Consultation Number	Species
November 3, 1988	Initial Approval of Life of Mine Permit Area	Life of Mine Permit Area	2-22-88-I-123	Mancos milkvetch (*Astragalus humillimus*), Mesa Verde cactus (*Sclerocactus mesae-verdae*), bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus anatum*), Colorado squawfish-now Colorado pikeminnow (*Ptychocheilus lucius*)
August 8, 1990	Addition of Block B to permit area	Block B	2-22-90F-102	Colorado squawfish, Mesa Verde cactus
April 15, 1992	Addition of Blocks A, C, and D to permit area	Clocks A, C, D	2-22-92-I-171	American peregrine falcon, bald eagle, Colorado squawfish, razorback sucker (*Xyrauchen texanus*), Mancos milkvetch, Mesa Verde cactus, Mancos saltbush (*Proatriplex pleiantha*)
August 31, 1994	Permit Renewal for Permit Area	Permit Area	2-22-94-I-529	American peregrine falcon, bald eagle, Colorado squawfish, razorback sucker, Knowlton cactus (*Pediocactus knowltonii*), Mancos milkvetch, Mesa Verde cactus, Potential habitat for the Mexican spotted owl (*Strix occidentalis lucida*), Potential habitat for southwestern willow flycatcher (*Empidonax traillii extimus*)
September 18, 2001	South Dixon Extension	Dixon Pit extension area (654 acres)	2-22-01-I-623	Knowlton cactus, Mancos milkvetch, Mesa Verde cactus, razorback sucker, Colorado pikeminnow, bald eagle, black-footed ferret (*Mustela nigripes*), Mexican spotted owl, Southwestern willow flycatcher
March 7, 2005	Area IV North Mine Plan Approval	Area IV North	2-22-04-I-523b	Bald eagle, black footed ferret, Mexican spotted owl, southwestern willow flycatcher, yellow-billed cuckoo (*Coccyzus americanus*)

1.2 Current Biological Review

Between February and June of 2011, Ecosphere biologists conducted pedestrian biological surveys of the Action Area (refer to Section 2.2) under NNDFW Special Permit #621 for the specific purpose of this evaluation. The purpose of the surveys was to evaluate the potential presence/absence of federal and Navajo Nation listed species and to determine whether activities proposed by the current Proposed Action have potential to impact species from either list.

In addition to biological surveys completed in the areas that would be directly affected by ground-disturbing activities, annual raptor and wildlife monitoring has been ongoing at Navajo Mine since 1993

and continues today in all active areas of the mine (Areas I, II, III, and IV North) and within a one-mile buffer of the lease boundary (refer to Chapter 10 of BNCC's current Surface Mining Control and Reclamation Act [SMCRA] Permit). This monitoring is required by OSM, and the results are included in this evaluation for Areas I, II, III, and IV North.

Finally, numerous wildlife and biological resource investigations, and threatened and endangered species surveys associated with a variety of federal actions dating back to the early 1970s, have been conducted on Navajo Mine (inclusive of Areas I, II, III, and IV North). BNCC's current SMCRA Permit includes considerable amounts of wildlife, vegetation, and sensitive species information from these previous investigations and surveys. Ecosphere biologists reviewed the substantial biological baseline that exists for Navajo Mine and the surrounding area as part of the current biological review necessary for the completion of a thorough BE. The objectives of this BE are as follows:

1. Compile a list of federal and NNHP listed threatened and endangered, candidate, and sensitive species potentially occurring in the Action Area.
2. Provide a physical and biological description of the Action Area.
3. Determine the presence of federal and NNHP listed threatened and endangered, candidate, or sensitive species in the Action Area. Determine the presence of critical habitat for listed, candidate, and sensitive species in the Action Area.
4. Assess potential impacts the federal action may have on any federally listed or candidate species, or critical habitat with potential to occur in the Action Area.
5. Identify and present conservation measures for any Federally listed or candidate species, or critical habitat with potential to occur in the Action Area.

2. PROJECT DESCRIPTION

The federal action at issue is BNCC's pre-2016 mine plan revision submitted to OSM on February 15, 2011 and BNCC's Individual Permit (IP) application with the U.S. Army Corps of Engineers (USACE) to consolidate several existing Nationwide Permits at Navajo Mine under a single IP. The pre-2016 mine plan revision was deemed administratively complete by OSM on March 18, 2011. The decision to mine Area IV North was made when the area was included in Permit No. NM-0003A in 1989. The current Proposed Action seeks approval from OSM for BNCC's proposed Area IV North mine plan revision.

The Proposed Action includes several primary components: mining activities, transportation of coal from the mine site to the FCPP, road and infrastructure construction/maintenance, and reclamation. The proposed mine plan revision encompasses a total of 830 acres. Figure 1 (see Attachment A) shows the proposed permit revision in Area IV North and includes the existing disturbance areas (cleared lands and constructed infrastructure). Of these acres, 704 acres are directly associated to mining activities including an appropriate perimeter buffer for mining support activities (e.g., topsoil removal, haul roads, ponds etc.). Of these 704 acres, 268 acres are currently disturbed because of development activities under the previously approved 2005 SMCRA permit revision (Permit NM-0003-F-R-01). Figure 1 also shows the area currently permitted by OSM for mining in Area III that has not yet been mined (approximately 700 acres) and shows the proposed realignment of the Burnham Road (approximately 75 acres). Table 2-1 provides a breakdown of the surface areas that would be disturbed by the Proposed Action. Mining activities in other areas of the mine (Areas I and II) that are affected by the Proposed Action include infrastructure, transportation, reclamation, and coal delivery activities that would not involve new surface disturbances. A more detailed description of the proposed pre-2016 mine plan revision is available in BNCC's application that OSM has made publicly available in accordance with 30 CFR 773.6(a)(2) available at:

http://www.wrcc.osmre.gov/Current_Initiatives/Navajo_Mine/AreaIVNorth.shtm.

Hard copies are also available at the Farmington Public Library (Farmington, New Mexico), OSM Farmington Field Office (Farmington, New Mexico), OSM Western Region Office (Denver, Colorado), and Navajo Nation Minerals Department (Window Rock, Arizona).

This BE addresses the potential impacts to federal and tribally listed species from proposed and ongoing mining in Area IV North and Area III, and includes mining activities in all other currently mined areas within the Navajo Mine, specifically Areas I and II (e.g., rail operations, coal hauling, reclamation, etc.) and realignment of the Burnham Road.

Table 2-1 Proposed Action Surface Disturbing Components

Project Component	Surface Disturbance (acres)
OSM Previously Approved Area III Mining Surface Disturbance[1]	701
OSM Previously Approved Area III Existing Surface Disturbance	358
Existing Mine Ancillary Roads (8.1 miles)	20
Existing Powerlines (6.0 miles)	32
Burnham Road Realignment (5.2 miles)	75
Area IV North Mining Surface Disturbance	704
TOTAL	1,890[2]
Proposed Newly Permitted Disturbance	779[3]

[1] Subject to consultation No. 2-22-01-I-623

[2] Acres includes OSM permitted areas in Area III (ongoing) for consideration by the USACE and proposed new disturbance in Area IV North

[3] Surface disturbances associated with the Area IV North Mine Plan Revision being considered by OSM

2.1 Project Location

The proposed project is located in San Juan County, New Mexico, on Navajo Nation Tribal Trust lands, approximately 18.5 miles (30 kilometers) (km) southwest of Farmington and entirely within the Nenanhezad Chapter. A location map is provided as Figure 2 in Attachment A.

The proposed mining activities would be located in Sections 30 and 31 in Township 27 North, Range 15 West; Sections 6, 7, and 18 of Township 26 North, Range 15 West; Section 10 in Township 27 North, Range 16 West; and Sections 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, and 16 of Township 26 North, Range 16 West, New Mexico Principal Meridian (NMPM). The proposed project is located on the Hogback South, Kirtland SW, Newcomb NE, and the Pillar NW, New Mexico 7.5-minute U.S. Geological Survey topographical maps (refer to Attachment A).

2.2 Action Area

The Action Area was delineated based on consideration of all direct and indirect effects of the Proposed Action [50 CFR 402.02 and 402.14(h)(2)]. The Action Area analyzed in this BE was determined based on maximum distance that a particular impact from mining could reasonably be expected to effect a listed or sensitive species. For example, in this BE the Action Area was largely determined by spatial factors such as the distance mining noise could be heard over ambient noise and by the distance that fugitive dust could reasonably travel from mining activities. The Action Area was determined to be the entire

Navajo Mine lease area plus a one-mile buffer. The Action Area was based on the results of the noise and air analyses completed in the EA and is a conservatively large Action Area to assess potential impacts to listed species from the Proposed Action.

The noise analyses in the EA evaluated various mining activities. Coal removal activities are the loudest continuous noise (L_{eq} – Equivalent Sound Level) generated at Navajo Mine measured at 72.6 decibels A-weighted sound level (dBA) at 165 feet from an active dragline. At 1 mile from the source, the sound dissipates to 42.5 dBA. For context, this noise level is comparable to the sound of a refrigerator running. Blasting at Navajo Mine creates a louder, instantaneous noise (L_{max} - Maximum Noise Level) measured at approximately 69 dBA at 1 mile. This sound is comparable to standing 50 feet from an operating lawnmower—but lasts for a few seconds and then rapidly dissipates (L_{max}). The background ambient noise level in the Action Area is around 30 to 35 dBA. While continuous or near-continuous noise metrics—such as L_{eq}—are typically used to assess annoyance impacts on humans, it is generally recommended that both instantaneous (L_{max}) and continuous noise metrics (L_{eq}) be used to assess potential impacts to wildlife (Pater et al. 2009).

The results from the fugitive dust analysis completed for the EA demonstrates that the annual average particulate matter ($PM_{2.5}$) concentration contours emanating from the highest source (active mine pits) illustrate that there would be negligible potential for longer-term effects outside the mine boundary.

While more than 95 percent of the emissions and noise generated by the Proposed Action will emanate from within Areas IV North and III, the remaining approximately 5 percent may be attributable to other ongoing mining infrastructure activities in Areas I and II such as coal transport, stockpile management, reclamation, and equipment movement.

As such, for purposes of this BE, the Action Area is conservatively extended by 1 mile beyond the mine lease area. Figure 3 in Attachment A shows the Action Area delineated for this analysis. In general, the Action Area extends from the San Juan River south to the southern lease boundary (Area V).

Critical Habitat

The Action Area evaluated in this BE includes a small area of designated critical habitat for the Colorado pikeminnow (*Ptychocheilus lucius*) and the razorback sucker (*Xyrauchen texanus*), both federally endangered fish that live in the San Juan River.

Critical habitat for the Colorado pikeminnow includes the San Juan River and its 100-year floodplain from the State Route 371 Bridge in Township 29 North, Range 13 W, Section 17 (NMPM) to Neskahai Canyon in the San Juan arm of Lake Powell in Township 41 South, Range 11 East, Section 26 (Salt Lake Principal Meridian) up to the full pool elevation.

Critical habitat for the razorback sucker includes the San Juan River and its 100-year floodplain from the Hogback Diversion in Township 29 North, Range 16 West, Section 9 (NMPM) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in Township 41 South, Range 11 East, Section 26 (Salt Lake Principal Meridian).

Critical habitat for these fish is approximately 16 miles north of the proposed mining activities in Area IV North and Area III and is 16 to 25 miles from the proposed realignment of Burnham Road. Critical habitat in the Action Area is represented by the only portion of the San Juan River included in the Action Area (refer to Figure 3 in Attachment A). At its closest point to infrastructure activities related to the Proposed Action, the San Juan River and critical habitat are approximately 3.3 miles away from the coal delivery terminal at the FCPP (Area I).

No other critical habitat for any other listed species falls within the Action Area.

3. Listed Species Screening and Field Survey Methodology

3.1 Pre-Field Species Screening

Prior to conducting fieldwork, Ecosphere contacted the NNDFW and the USFWS New Mexico Ecological Services Office regarding the proposed project and to acquire agency lists of federally protected and NNHP listed species of concern with potential to occur in San Juan County, New Mexico. These agency data request letters and the corresponding responses from each agency are provided in Attachment B.

According to the USFWS, there are 11 federally listed threatened, endangered, and candidate species with potential to occur in San Juan County. Table 3-1 lists these species, their conservation status, habitat associations, and potential to occur in the Action Area.

The species listed by the Navajo Nation are map quadrangle-specific rather than project-site specific. The NNHP currently lists 11 species of concern with potential to occur on the U.S. Geological Survey (USGS) 7.5-minute topographic maps that encompass the Action Area. Table 3-2 lists these species, their conservation status, habitat associations, and potential to occur in the Action Area.

Table 3-1 Species Listed by the USFWS for San Juan County, New Mexico (Under the Authority of the Endangered Species Act of 1973)

SPECIES	STATUS	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION AREA
MAMMALS			
Black-footed ferret (*Mustela nigripes*)	Endangered	Open grasslands with year-round prairie dog (*Aquila chrysaetos* colonies greater than 198 acres in size with greater than 20 burrows per 2.5 acres.	There are no prairie dog (*Aquila chrysaetos*) colonies of sufficient size to support black-footed ferret in the Action Area.
Canada lynx (*Lynx Canadensis*)	Candidate	Generally occurs in boreal and montane forests dominated by coniferous or mixed forest with thick undergrowth.	No boreal or montane forests occur within the Action Area.
BIRDS			
Mexican spotted owl (*Strix occidentalis lucida*)	Threatened with Critical Habitat	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.	No suitable habitat in the Action Area due to lack of mixed conifer forests or forested canyons.

SPECIES	STATUS	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION AREA
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Endangered with Critical habitat	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	One known breeding territory has been documented along the San Juan River approximately 15 miles downstream of Shiprock, NM. Numerous willow flycatchers have been documented in migration along the San Juan River. No critical habitat for this species occurs in San Juan County. Suitable, but sparse migratory stopover habitat occurs in thin patches of short willow (less than 6 feet in height) and in scattered patches of exotics such as tamarisk (*Tamarix sp.*) and/or Russian olive (*Elaeagnus angustifolia*), along Cottonwood Arroyo and Chinde Wash, along other area ephemeral drainages and at a small stock pond approximately 2 miles south of the Area IV North mining area. No suitable nesting habitat currently exists within the Navajo Mine lease area. Small willow patches along the lower Chinde Wash may be enhanced by mitigation efforts to provide potential nesting opportunities in the future.
Yellow-billed cuckoo (*Coccyzus americanus*)	Candidate	Breeds in riparian woodlands with dense, understory vegetation.	No suitable habitat within the Navajo Mine lease area due to lack of riparian woodland habitats and perennial water resources. Potential habitat occurs in the Action Area along the San Juan River.
FISH			
Colorado pikeminnow (*Ptychocheilus lucius*)	Endangered with Critical Habitat	Large rivers with strong currents, deep pools, and quiet backwaters.	No suitable habitat within the Navajo Mine lease area due to lack of perennial waters. Critical habitat located on the San Juan River within the Action Area.
Razorback sucker (*Xyrauchen texanus*)	Endangered with Critical Habitat	Medium to large rivers with silty to rocky substrates. Prefers strong currents and deep pools.	No suitable habitat within the Navajo Mine lease area due to lack of perennial waters. Critical habitat located on the San Juan River within the Action Area.
Roundtail chub (*Gila robusta*)	Candidate	Large rivers. present in low numbers in the San Juan, Mancos, La Plata, and Animas rivers in Colorado and New Mexico.	No suitable habitat within the Navajo Mine lease area due to lack of perennial waters. Potential habitat occurs within the northern extremities of the Action Area in the San Juan River.
PLANTS			

SPECIES	STATUS	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION AREA
Knowlton's cactus (*Pediocactus knowltonii*)	Endangered	Alluvial deposits that form rolling, gravelly hills in piñon-juniper and sagebrush communities (6,200-6,400 feet).	No rolling, gravelly alluvial deposits vegetated with piñon-juniper woodland in the Action Area.
Mancos milkvetch (*Astragalus humillimus*)	Endangered	Cracks of Point Lookout Sandstone of the Mesa Verde series (5,000-6,000 feet).	Point Lookout Sandstone does not occur in the Action Area. The nearest protrusion of this formation is several miles west of Navajo Mine along the Hogback Monocline.
Mesa Verde cactus (*Sclerocactus mesae-verdae*)	Threatened	Highly alkaline soils in sparse shale or adobe clay badlands of the Mancos and Fruitland formations (4,000-5,550 feet).	The majority of soil substrates in the Action Area have been disturbed or are Sands. Badlands in the area are capped with sandstone or red cinders and do not provide suitable habitat.

Source: USFWS 2011

Table 3-2 Navajo Nation Species of Concern with Potential to Occur in the Area Encompassed by The Hogback South, New Mexico (USGS 7.5-minute Topographic Map)

SPECIES	NNHP STATUS [a]	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION AREA
MAMMALS			
Black-footed ferret (*Mustela nigripes*)	Group 2	Open grasslands with year-round prairie dog (*Aquila chrysaetos*) colonies greater than 198 acres in size with greater than 20 burrows per 2.5 acres.	There are no prairie dog (*Aquila chrysaetos*) colonies of sufficient size to support black-footed ferret in the Action Area.
Kit fox (*Vulpes macrotis*)	Group 4	Desert scrub or desert grassland with soft, alluvial or silty-clay soils, with sparse vegetation cover.	Recorded as occurring in the Action Area.
BIRDS			
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Group 2	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	Has potential to occur. Refer to Table 3.

SPECIES	NNHP STATUS [a]	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION AREA
Ferruginous hawk (*Buteo regalis*)	Group 3	Nests in badlands, flat or rolling grasslands and desert scrub.	Known to nest in the Action Area.
Golden eagle (*Aquila chrysaetos*)	Group 3	Open habitats in mountainous, canyon terrain. Nests primarily on steep cliffs and occasionally large trees.	Known to occur in the region and Action Area although only 2 nest sites detected within 2 miles of the lease area since raptor monitoring was initiated in 1993.
American peregrine falcon (*Falco peregrinus anatum*)	Group 4	Cliffs that generally exceed 200 feet in height near permanent surface water.	Known to occur in the region, although the Action Area lacks high cliffs suitable for nesting/perching for this species.
Mountain plover (*Charadrius montanus*)	Group 4	Breeds in short sparse vegetation in disturbed-prairies or semi-deserts with less than a two-degree slope.	Suitable habitat has been documented and several individual plovers detected in Areas IV South and V of the Navajo lease area within the Action Area.
Western burrowing owl (*Athene cunicularia hypugea*)	Group 4	Nests in ground burrows (often deserted prairie dog (*Aquila chrysaetos*) burrows) in dry open grasslands or desert scrub.	This species has been recorded as breeding within the Action Area.
PLANTS			
Mancos milkvetch (*Astragalus humillimus*)	Group 2	Cracks of Point Lookout Sandstone of the Mesa Verde series (5,000-6,000 feet).	Has no potential to occur. Refer to Table 3.
Mesa Verde cactus (*Sclerocactus mesae-verdae*)	Group 4	Highly alkaline soils in sparse shale or adobe clay badlands of the Mancos and Fruitland formations (4,000-5,550 feet)	Has no potential to occur. Refer to Table 3.
San Juan milkweed (*Asclepias sanjuanensis*)	Group 4	Sandy loam soils in juniper savanna and Great Basin desert scrub at 5,000-5,500 feet.	Potential habitat for this species occurs within the Action Area.

Navajo Nation Endangered Species List (NESL): Group 2 (G2) = species whose prospects of survival or recruitment are in jeopardy; Group 3 (G3) = species whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future; Group 4 (G4) = species for which the NNDFW does not currently have sufficient information to support their being listed in G2 or G3. The NNDFW will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list. G4 species are "candidates" for listing and have no legal protection under section 507. Sensitive = species for which there may be some concern range-wide; however there is not enough information to support inclusion on the NESL.

3.2 Field Surveys

Numerous wildlife and biological resource investigations, and threatened and endangered species surveys, associated with a variety of federal actions dating back to the early 1970s, have been conducted within the Navajo Mine lease area and Action Area. Annual raptor and wildlife monitoring was initiated at the mine in 1993 and continues today in all active areas of the mine (Areas I, II, III, and IV North) and within a one-mile buffer of the lease boundary (refer to Chapter 10 of BNCC's current SMCRA Permit).

In addition to the annual surveys, Ecosphere biologists/botanists conducted several general reconnaissance and targeted surveys of the Action Area between February and June 2011. The general reconnaissance surveys consisted of ground pedestrian surveys as well as windshield surveys in Areas I and II. Intensive pedestrian surveys were conducted in areas that would be newly disturbed by the Proposed Action within Area IV North and along the proposed Burnham Road Realignment. These surveys focused on identification of habitat parameters that comprise the environmental baseline condition for listed species. Included in Tables 3-1 and 3-2 is a description for the potential of each listed species to occur in the Action Area. Intensive surveys were conducted where prairie dog (*Aquila chrysaetos*) towns were detected, on select habitat areas such as known raptor nesting areas, and along ephemeral and intermittent washes. Portions of Area III that are actively being mined were not surveyed due to absence of habitat.

Additionally, related to the Clean Water Act (CWA) mitigation planning efforts, extensive survey and planning analyses were conducted along the lower reach of Chinde Wash, an intermittent drainage and wetland complex through Area II of Navajo Mine. The approximately 27-acre wetland complex is located on approximately 43 acres of land within the Chinde floodplain. The balance of the area is characterized by approximately 9 acres of scattered exotic riparian vegetation, such as tamarisk (*Tamarix sp.*) and Russian olive (*Elaeagnus angustifolia*), and about 7 acres of other scattered herbaceous and woody native riparian areas. Current planning efforts are for the purpose of re-establishing and enhancing approximately 8 to 10 acres of wetland vegetation community types and wetlands functions at the site by way of removing exotic riparian species and replacing them with native riparian shrubs (e.g., willow [*Salix exigua*], New Mexico privet [*Forestiera neomexicana*], and serviceberry [*Amelanchier arborea*]), and trees (e.g., cottonwoods [*Populus* sp.]). Biological investigations included vegetation inventories, wetland delineations, and wildlife monitoring.

4. ENVIRONMENTAL BASELINE

The environmental baseline is the current (pre-project) condition of pertinent habitat parameters for the listed species with potential to occur in the Action Area. The environmental baseline includes the past and present impacts of all federal, state, and private actions in the Action Area and the anticipated impacts of all proposed federal projects in the Action Area that have already undergone formal consultation with the USFWS. Table 1-1 in Section 1.1 lists all previous formal consultations associated with mining activities at Navajo Mine that represent part of the environmental baseline for this Proposed Action. Previous consultations relating to the mine included Areas I, II, III, and IV North. Also included in this section is characterization of the general environmental setting.

4.1 General Environmental Setting

This description supplements the environmental baseline for listed species by generally characterizing the physical parameters (e.g., elevation, geology, soils, topography, etc.) and biological communities that constitute the Action Area. Detailed descriptions are in the project EA and in BNCC's SMCRA permit.

4.1.1 Existing Disturbance on Navajo Mine

The federal permit (NM-0003F) to mine coal at Navajo Mine was renewed on September 8, 2010; and the current reserves, current permit (2009-2014), and contract allow mining to continue at its current rate through mid-2016. About 18,520 acres are within the current permit. Presently about 13,255 acres have been disturbed by mining operations described above, and approximately 7,925 acres have been reclaimed. Areas disturbed within Areas I, II, and III that have not yet been reclaimed consist of various essential infrastructure such as a rail line to the coal handling facilities, a road network, electric utilities infrastructure, stormwater and drainage controls, ramps and pits, and a variety of equipment and maintenance shops. These facilities make up approximately 1,800 acres of the unreclaimed acreages.

4.1.2 Physical Conditions

Terrain in the Action Area is characterized by a mix of low lying, gently rolling hills and areas of steep cliffs (escarpments) associated with exposed and weathered bedrock material. The mesa tops associated with the outcrop areas are local high points, with vistas of the Chuska Mountains to the west and the interior San Juan Basin to the east. Topography is variable across the Action Area with the Areas I, II, and III characterized by rolling and flat terrain, and Area IV and the southern portion of the Action Areas characterized by flat mesas with 50- to 150-foot escarpments dropping to valley bottoms or benches. The general aspect is to the west, towards the Chaco River, an intermittent stream approximately a mile southwest of the Action Area. Elevations range is from about 5,100 feet at the San Juan River to approximately 5,400 feet within the mine lease area.

In undisturbed portions of the Action Area, surface geologic material consists of eroded badlands with areas of exposed weathered bedrock material associated with escarpments, eolian sand deposits, and colluvium (loose sediment collected at the base of slopes). Soil texture across the Action Area is variable

and ranges from sandy loam to clay loam. The underlying bedrock is primarily late Cretaceous Fruitland Formation.

With the exception of the San Juan River itself, surface water within the Action Area generally flows toward the west to the Chaco River via numerous tributary drainages. The Chaco River occurs at a variable distance of 1 to 4 miles from the west side of the Action Area. Cottonwood Arroyo is located at the north end of Area IV North and immediately east and south of Area III; it is the largest tributary system in the Action Area. It flows between active mining in Area III and proposed mining in Area IV North. Other than the San Juan River and its floodplain and Morgan Lake, there are no other perennial waters in the Action Area. The Cottonwood Arroyo and Chinde Wash are intermittent streams hydrologically influenced by irrigation practices at the Navajo Agriculture Products Industry (NAPI) farmlands immediately east of Navajo Mine. Wetlands occur along the river and along the margins of Morgan Lake. There is an approximately 27-acre wetland complex (cattail/bull rush) on the lower Chinde Wash within the mine lease area, another large wetland east of and upstream of the Yazzie and Hosteen Areas above the reconstructed Chinde Wash channel, a small wetland and sparse riparian woody vegetation south of the topsoil stockpile known as the “birthday cake,” and a minor wetland complex associated with a stock pond along the border between Area IV South and Area V within the Action Area. All of these wetland areas are hydrologically influenced by NAPI surface discharges. All sites are characterized by cattail flats with scattered exotics (mostly tamarisk) and few native riparian shrubs bordering the cattails.

4.1.3 Biological Communities

Vegetation

The Action Area is primarily characterized as Great Basin Desertscrub (Dick-Peddie 1993) with the exception of the San Juan River floodplain being riparian. Six vegetation community types within the Great Basin Desertscrub are present in the Action Area: Arroyo Shrub, Dunes, Sands, Alkali Wash, Thinbreaks, and Badlands. In undisturbed portions of the Action Area, dominant shrub species in the desert scrub community include greasewood (*Sarcobatus vermiculatus*), saltbush (*Atriplex obovata*), shadscale (*Atriplex confertifolia*), and four-winged saltbush (*Atriplex canescens*). Throughout the uplands of the Action Area, forbs are the most dominant vegetative life form, followed by shrubs and then grasses. Overall, undisturbed areas are sparsely vegetated with cover ranging from 0 to 5 percent in badland communities to approximately 15 to 25 percent in Arroyo Shrub and Alkali Wash communities. The most common plant species overall is Russian thistle (*Salsola tragus*)—an introduced weed—followed by scorpion weed (*Phacelia crenulata*) and cryptantha (*Cryptantha crassisepela*). In mine-reclaimed areas, vegetative cover is higher due to the objective of establishing a post-mining rangeland condition.

The San Juan River corridor in the northern extent of the Action Area is characterized by mixed native-exotic riparian woodlands characterized by stands of willow, salt cedar (*Tamarix sp.*), Russian olive, and cottonwood. Unnamed ephemeral drainages in the Action Area have very few riparian trees and shrubs, typically characterized by patches of salt cedar and greasewood. Cottonwood Arroyo contains thinly

scattered willow, less than 5 feet in height, along an approximate 100-foot reach between Areas III and IV. As described above, several other large and small wetland complexes occur along the lower portion of Chinde Wash above the Big Fill and another on the upper reestablished Chinde Wash channel. The lower Chinde Wash contains approximately 27 acres of wetlands characterized by cattail (*Typha latifolia*) marshes with scattered patches of hardstem bulrush (*Schoenoplectus acutus*).

In addition, there are large areas (approximately 9 acres) dominated by Russian olive and tamarisk along the edges of the cattail marshes and scattered throughout the riparian corridor. Interspersed with the tamarisk and Russian olive are patches of coyote willow (*Salix exigua*) and plains cottonwood (*Populus deltoides*). There are two dense willow stands within the area. One stand is adjacent to the haul road and is approximately 30 by 20 feet in size. The willows are greater than 9 feet in size, and density is greater than 90 percent. Another stand of willows adjacent to the cottonwood gallery is approximately 50 feet by 20 feet in size. The willows on the edge of the patch are scattered and less than 6 feet in height, but the center of the patch contains dense willows (greater than 90 percent cover) over 9 feet in height. A mature cottonwood gallery located near the center of the Lower Chinde complex has trees that are 25 to 30 feet high with an understory of riparian grasses and forbs. The few additional NAPI-influenced wetlands (described above) consist of cattails bordered by a scattered margin of tamarisk. A complete list of plant species that occur within the Navajo Mine lease area is in the BNCC SMCRA permit (BNCC 2011).

General Wildlife

A number of medium- and small-sized mammals are documented within the Action Area and are common throughout the Navajo Mine lease area and Four Corners Region. Species include coyote (*Canis latrans*), badger (*Taxidea taxus*), red fox (*Vulpes vulpes*), bobcat (*Lynx rufus*), and kit fox (*Vulpes macrotis)* (Ecosphere 2008b). Desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) are well documented in most habitats throughout the Action Area. Individuals of these species as well as their scat and tracks are commonly observed. Gunnison's prairie dog (*Cynomys gunnisoni*) is commonly documented within the lease area and is known throughout the Action Area (Ecosphere 2004b). Other common squirrel species include white-tailed antelope squirrel (*Ammospermophilus leucurus*), ground squirrel (*Spermophilus sp.*), and rock squirrel (*Spermophilus variegatus*). Small mammal species documented in the Action Area include Ord's kangaroo rat (*Dipodomys ordii*) and banner-tailed kangaroo rat (*Dipodomys spectabilis*), silky pocket mouse (*Perognathus flavus*), Apache pocket mouse (*Perognathus apache*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), woodrat (*Neotoma spp.*), northern grasshopper mouse (*Onychomys leucogaster*), and the Botta's pocket gopher (*Thomomys bottae*).

Baseline surveys for breeding birds have been conducted in the Navajo Mine lease area since 1975 as documented in BNCC's current SMCRA permit (BNCC 2011). Birds commonly documented in the Action Area include common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), mourning dove (*Zenaida macroura*), and western meadowlark (*Sturnella neglecta*). These species are also common in all upland habitats in the Action Area. The San Juan River and Morgan Lake provide habitat for a variety of waterfowl and

shorebird species including American avocet (*Recurvirostra americana*), black-crowned night heron (*Nycticorax nycticorax*), killdeer (*Charadrius vo*ciferus), Eurasian wigeon (*Anas penelope*), and cinnamon teal (*Anas cyanoptera*).

Reptiles common to the Action Area include western whiptail (*Cnemidophorus tigris*), gopher snake (*Pituophis melanoeucus*), bull snake (*Pituophis melanoeucus sub. sayi*), prairie rattlesnake (*Crotalus viridis*), short-horned lizard (*Phrynosoma douglassii*), side-blotched lizard (*Uta stansburiana*), lesser earless lizard (*Holbrookia maculata*), and collared lizard (*Crotaphytus collaris*).

4.1.4 Potential Climate Change

Climate models project substantial changes in New Mexico's climate over the next 50 to 100 years—if no measures are taken to reduce global greenhouse gas emissions. Projected climate changes by mid- to late-21st century include air temperatures to be warmer by 6 to 12°F on average, but more in winter, at night, and at high elevations; more episodes of extreme heat, fewer episodes of extreme cold, and a longer frost-free season; more intense storm events and flash floods; and winter precipitation falling more often as rain, less often as snow.

Some climate models project that average precipitation will increase, while others predict a decrease. However, recurrence of a severe multiyear drought like that of the 1950s is likely to occur during this century, regardless of human-caused climate change. When such a drought does recur, higher evaporation rates due to warmer temperatures will exacerbate effects of drought and will at least partially offset the effect of any increase in precipitation that might occur due to climate change.

4.2 Habitat Characteristics for Federally Listed Species and Availability in the Action Area

This section describes the habitats required by federally listed species with potential to occur in the Action Area and quantifies the extent of suitable habitat in the Action Area for each species.

4.2.1 Southwestern Willow Flycatcher

Distribution and Habitat Characteristics: Southwestern willow flycatchers are neotropical migrants that occur in dense riparian habitats along streams, rivers, and other wetlands where cottonwood, willow, boxelder (*Acer negundo*), tamarisk, Russian olive, and arrowweed (*Pluchea sericea)* are present (USFWS 2002). Nests are found in thickets of trees and shrubs primarily 13 to 23 feet in height, and among dense and homogenous foliage (USFWS 2002). Habitat occurs at elevations below 8,500 feet (USFWS 2002).

The breeding range of the southwestern willow flycatcher includes New Mexico, southern Colorado and Utah, central and southern California, and southern Nevada. In New Mexico, the subspecies is known to occur and breed at only one location on the Navajo Nation along the San Juan River. This site is the only known historic breeding territory for southwestern willow flycatchers in San Juan County, New Mexico, and is located approximately 25 miles northwest of Navajo Mine. It occurs in several acres of willow stand approximately 15 feet in average height. There is standing water throughout the habitat patch

through the migration and breeding season (May through Sept). The site was discovered by biologists from Ecosphere under contract to the U.S. Department of the Interior in the late 1990s. No breeding of this species has been documented along the San Juan River since that time. Migrant willow flycatchers are commonly detected along the San Juan River between late-May to mid-June.

Habitat Availability in the Action Area: Thinly scattered, short-stature willow in an approximate 100-foot stretch of Cottonwood Arroyo between the existing Burnham Road and the proposed mining disturbance, represents potential—albeit limited —stopover habitat for southwestern willow flycatcher. There are also patches of tamarisk and/or Russian olive scattered along the Chaco River approximately 1 to 3 miles west of the Action Area, around Morgan Lake adjacent to Area I, along reaches of Chinde Wash, and thinly scattered along most intermittent washes in the Action Area. Within the approximately 7 acres of scattered native herbaceous and woody riparian patches on the lower Chinde Wash are two small willow patches. One is less than 0.02 acres in size, and the other less than 0.01 acres. These minor riparian habitats are considered *low suitability* habitats. Low suitability habitats are areas where native and/or non-native vegetation lacks the structure and density to support breeding flycatchers or exceeds the hydrologic parameter of greater than 100 meters (328 feet) from water. The lower reach of Chinde Wash has the potential to develop into suitable breeding habitat following the implementation of wetland mitigation along Chinde Wash. The presence of low suitability habitats may be important for migration and dispersal in areas where riparian habitats have been lost (i.e., agricultural and urban areas). Potential nesting and stopover habitat occurs along the San Juan River in the northern portion of the Action Area.

4.2.2 Yellow-billed Cuckoo

Distribution and Habitat Characteristics: Yellow-billed cuckoos (*Coccyzus americanus*) are insectivorous neo-tropical migrants that winter primarily in South America. Suitable habitat for yellow-billed cuckoo is limited to narrow, and often widely separated, riparian cottonwood-willow galleries, as well as tamarisk (Federal Register 2000). Dense understory foliage appears to be an important factor in nest site selection, whereas cottonwood trees are an important foraging habitat for the yellow-billed cuckoo. The species is usually found at elevations below 6,600 feet and is documented in southern, central, and extreme northeast Arizona (Federal Register 2000). Breeding habitat is typically characterized by dense riparian vegetation with a gallery overstory of mature cottonwood trees coupled with a dense secondary tree/shrub layer.

In the west, the species is widespread and locally common in California, Arizona, New Mexico, Oregon, and Washington. The yellow-billed cuckoo is also found in portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah; and it is widespread and uncommon to common in portions of Texas (Federal Register 2000). Historically, the yellow-billed cuckoo has been documented as occurring along the San Juan River from Navajo Reservoir to the Arizona state line (Travis 2002). The Bureau of Land Management (BLM), Farmington Field Office (FFO) documented this species at five of their San Juan River tract management parcels during 2002 and 2003 surveys between the Hogback and Bloomfield, New Mexico.

Habitat Availability in the Action Area: Much of the San Juan River corridor can be described as poor (due to lack of understory density beneath cottonwood galleries) to good migratory stopover habitat (habitat constituents as described above are present) with only very limited areas exhibiting quality potential breeding habitat. This characterization is supported by the low numbers of breeding yellow-billed cuckoos detected along the San Juan River. No other areas within the Action Area provide potential habitat for the yellow-billed cuckoo.

4.2.3 Colorado Pikeminnow

Distribution and Habitat Characteristics: The Colorado pikeminnow is a cyprinid fish species endemic to the Colorado River Basin. The species was once distributed throughout the major rivers and tributaries of the basin in Wyoming, Colorado, Utah, New Mexico, Arizona, Nevada, and California.

Adult fish inhabit large to medium rivers and are found in turbid, deep pools with a strong current and rocky or sand substrate. Juvenile fish use backwater and side channel habitats with silt and sand substrates and largely consume insects and crustaceans. Pikeminnow spawn when water temperatures approach 18°C (64°F). Preferred spawning sites are riffles with gravel or cobble substrates (Lamara et al. 1985). The Colorado pikeminnow has been collected over a 241 km (150 mile) section of the San Juan River from Lake Powell to near Farmington, New Mexico (Ryden 2000).

Wild Colorado pikeminnow were generally believed to have been extirpated from the San Juan River after the construction of Navajo Dam in 1965; however, two adult pikeminnow were collected in 1987 from the San Juan River between Shiprock and the Four Corners area, confirming the species was still present (Platania 1990). Subsequent mark/recapture studies estimated that 19 wild Colorado pikeminnow inhabited the San Juan River (Ryden 2000). Larval and juvenile pikeminnow have been collected from low velocity habitats downstream of River Mile (RM) 130 and from Shiprock to the confluence of Lake Powell (Ryden 2000). Larval fish surveys are conducted annually on the San Juan River below the Cudei Diversion (RM 141.5) downstream of Shiprock, New Mexico. Larval Colorado pikeminnow were collected in 2004 and 2007. A total of 134 age-1+ Colorado pikeminnow was collected in 2008. These juvenile fish were likely individuals stocked during 2007 (Brandenburg and Farrington 2009).

On the Navajo Nation, the Colorado pikeminnow has been documented throughout the San Juan River from Shiprock to Lake Powell. The majority of adults use the stretch of the San Juan River about 11 km (6.8 miles) downstream of Shiprock to just downstream of Four Corners. Irrigation return flow channels that feed into the San Juan River may also provide potential habitat.

Potential to occur in the Action Area: Occupied habitat and designated critical habitat occurs in the San Juan River in the northern portion of the Action Area approximately 16 miles from proposed mining activities. No other habitat exists in the Action Area.

4.2.4 Razorback Sucker

Distribution and Habitat Characteristics: This species is found in backwaters, flooded bottomlands, pools, side channels, and other slower-moving river habitats below 6,000 feet elevation within the Colorado River basin. Razorback suckers have historically been found in large rivers near strong currents, and once inhabited the Colorado, Gila, Salt, Verde, and San Pedro rivers. They have also been found in the San Juan River from Farmington to Lake Powell. Razorback suckers spawn prior to spring runoff in late March or early April over sand or gravel substrates.

On the Navajo Nation, this species has the potential to occur within the San Juan River, upstream from Lake Powell. However, the only occurrences of wild razorback suckers from the San Juan River are from Bluff, Utah (RM 85), in 1978 and the late 1980s. Reproduction by stock razorback suckers is occurring within the San Juan River. Larval razorback suckers have been documented every year since 1998 (Brandenburg and Farrington 2009).

During 2008 adult monitoring surveys, no wild adult razorback suckers were collected. A total of 78 stocked razorback suckers were collected in 2008, the fifth consecutive year that more than 50 were collected during adult monitoring surveys (Ryden 2009). Five razorback suckers were collected upstream of the Hogback Diversion (RM 158.6). However, no razorback suckers were collected upstream of either Arizona Public Service Diversion (RM 163.7) or the Public Service Company of New Mexico (PNM) Weir and fish ladder (RM 166.6) during adult monitoring in 2008. Over the last 8 years, the number of older fish collected during adult monitoring surveys has changed minimally. Similar to Colorado pikeminnow, the surveys indicate that older razorback suckers are present in the San Juan River in low numbers but are difficult to detect during single-pass electrofishing efforts (Ryden 2009).

Larval fish surveys are conducted annually on the San Juan River below the Cudei Diversion (RM 141.5) downstream of Shiprock, New Mexico. A total of 126 larval razorback suckers were collected during 2008 surveys. All of the razorback sucker larvae collected in 2008 were found in either backwater or slackwater habitat types (Brandenburg and Farrington 2009).

Potential to occur in the Action Area: Occupied habitat and designated critical habitat occurs in the San Juan River in the northern portion of the Action Area approximately 16 miles from proposed mining activities. No other habitat exists in the Action Area.

4.2.5 Roundtail Chub

Distribution and Habitat Characteristics: This species occurs in large rivers and streams in the Upper Colorado River Basin such as the Green, Yampa, and Colorado rivers. It is also present but less abundant in the lower Basin drainages such as the San Juan River. The roundtail chub is documented in small numbers in the Mancos, La Plata, and Animas rivers in Colorado and New Mexico.

In 1994, native fish studies conducted on the Animas River recorded a single roundtail chub collected between the San Juan and Florida rivers (Miller et al. 1995). Miller and Rees (2000) described historical and recent accounts of roundtail chub in the mainstem of the San Juan River and various tributaries in

the southwestern portion of Colorado and in New Mexico. No larval roundtail chub were collected in the San Juan River in 2009 (Brandenburg and Farrington 2009).

Potential to occur in the Action Area: Potential habitat for this species occurs in the San Juan River in the northern portion of the Action Area approximately 16 miles from proposed mining activities. No other habitat exists in the Action Area.

4.3 Habitat Characteristics for Navajo Nation Listed Species and Availability in the Action Area

This section describes the general habitat characteristics of Navajo Nation listed species with potential to occur in the Action Area and quantifies the extent of suitable habitat in the Action Area for each species.

4.3.1 Kit Fox

Status: NESL Group 4; not listed under the ESA.

Distribution and habitat: This species occurs in open desert scrub or desert grasslands where it excavates dens in soft, alluvial or silty clay soils. Home ranges vary from 260 to 520 hectares up to 1,160 hectares during times of prey scarcity. Common prey species are the most abundant nocturnal rodent or lagomorphs (e.g., rabbit) in the area, while opportunistic prey species include birds, reptiles, and insects. Kit fox are distributed throughout most of northern Mexico, southern Idaho and Oregon, and the southwestern United States including Arizona, Colorado, California, Utah, and New Mexico.

Potential to occur in the Action Area: The entire Action Area offers potential habitat for this species. The flat, open desert scrub terrain and soft alluvial soils provide a potential burrowing medium. Signs and known occurrence of banner-tailed kangaroo rat and other rodents observed within the Action Area offer a prey base for kit fox. Kit fox are well documented in the Action Area as a result of various surveys completed within the mine lease area. Spotlighting surveys in 2005 documented several individuals (Ecosphere 2008b). No kit fox, or signs thereof, were observed within the areas to be disturbed under the Proposed Action during the field survey conducted on February 11, 2011.

4.3.2 Golden Eagle

Status: NESL Group 3, Eagle Protection Act, and Migratory Bird Treaty Act (MBTA); not listed under the ESA.

Distribution and habitat: Golden eagles (*Aquila chrysaetos*) are found year-round throughout northwestern New Mexico. They typically inhabit mountainous or hilly terrain, hunting over open country. On the Navajo Nation, golden eagle nests most often occur on steep cliff ledges, usually ≥ 100 feet in height; although shorter cliffs may also be used (Mikesic and Roth 2008). In other parts of its range, golden eagles may nest in large trees, manmade structures, and rarely on the ground. Nest sites are adjacent to open habitats that support preferred prey populations such as black-tailed jackrabbits,

desert cottontails, reptiles, and prairie dogs. Golden eagle territories in the west typically range from 12 to 20 square miles (Kochert et al. 2002).

Potential to occur in the Action Area: The relatively open shrublands and mild terrain of the project and Action Area provide potential foraging habitat for golden eagles. The prairie dog colonies and numerous other rodents located within the Action Area provide a prey base for golden eagles. Powerline poles, numerous rock escarpments, bluffs, and formations in and adjacent to the Action Area serve as potential perches. There have been only two records of nesting golden eagles in or near (within 5 miles) the Navajo Mine since raptor monitoring was initiated within the mine lease area in the early 1990s. One nest was found within the one-mile lease buffer near Area V in the mid-1990s. The other nest was found atop the Hogback Monocline several miles west of the mine lease. In general, the lower stature rock formations within the Action Area are preferred by smaller raptors, such as hawks, and by corvids, such as ravens and magpies. Because eagle home ranges are so large, and since there are numerous records of golden eagles nesting in San Juan County, it is likely that eagles occupying territories within 20 miles could utilize the Action Area for foraging.

4.3.3 Ferruginous Hawk

Status: NESL Group 3 and MBTA; not listed under the ESA.

Distribution and habitat: Ferruginous hawks (*Buteo regalis*) occur year round throughout the Navajo Nation, inhabiting dry, flat, or rolling grasslands and desert scrub (Mikesic 2008). This species prefers elevated nest sites, and nests on the Navajo Nation are most often on rock pinnacles, buttes, or short cliffs. Nests have also been documented in juniper (*Juniperus spp.*) trees, transmission-line towers, and on the ground (Mikesic 2008). Nest sites are adjacent to habitats supporting populations of preferred prey species, such as cottontails, jackrabbits, prairie dogs, and ground squirrels.

Potential to occur in the Action Area: The relatively flat terrain and open vegetation in the Action Area provide potential foraging habitat for ferruginous hawks. Prairie dog colonies provide a prey base for ferruginous hawks within and adjacent to the Action Area. Badlands in the Action Area offer potential nesting habitat for ferruginous hawks. Ferruginous hawk populations within and in close proximity to the Action Area have been monitored annually since 1993. On average, there are one-half dozen active nests in the survey area annually. One ferruginous hawk nest located just beyond the Action Area southeast of Area IV North was active in 2009 and 2010, and is active in 2011. Two historical nests southeast of Area IV North are within the Action Area. One of the nests has never been recorded as active; the second nest was last active in 1998 and 1999. Finally, a third historical territory occurs east-northeast of the Area IV North within the Action Area but none of the nests in that area has been active since 1993. Recorded home ranges of ferruginous hawks range from 3.7 square miles to 4.7 square miles (Bechard and Schmutz 1995). Ferruginous hawks nesting within and beyond the Action Area may forage in the area.

4.3.4 Western Burrowing Owl

Status: NESL Group 4 and MBTA; not listed under ESA

Distribution and habitat: The breeding range for the burrowing owl (*Athene cunicularia hypugea*) is widely distributed throughout western North America from south-central Canada and the Dakotas, south through Texas, to central Mexico and west to California, Oregon, and Washington; with a separate population in Florida and nearby islands (Mikesic and Roth 2008). The range of burrowing owls in the winter includes most of Texas and the southern portions of New Mexico, Arizona, and California, south through Mexico to the northern portions of Central America (Mikesic and Roth 2008). The potential range throughout the Navajo Nation includes all low-elevation desert habitats to higher elevation juniper habitat. Burrowing owls rely on existing burrows, primarily prairie dog, for nesting purposes, typically in dry open grasslands or grasslands with sparse juniper trees. Numerous burrowing owls inhabit the NAPI lands immediately east of the Action Area. The NAPI lands extend eastward for 20 to 30 miles.

Potential to occur in the Action Area: Western burrowing owl is known to nest in the Action Area (BNCC 2011). Two small prairie dog towns were delineated in the southern portion of Area IV North during the reconnaissance survey in February 2011. A possible burrowing owl nest from 2009 or 2010 was observed in the larger prairie dog town. Burrowing owls do not use the same nest site from year to year.

4.3.5 San Juan Milkweed

Status: NESL group 4, not listed under the ESA.

Distribution and habitat: The occurrence of San Juan milkweed (*Asclepias sanjuanensis*) is documented only in San Juan County, New Mexico. It is a perennial forb that occurs mostly in sandy or sandy loam soils in piñon-juniper woodland and Great Basin grassland at elevations of 5,000 to 6,000 feet, and in disturbed areas (Mikesic and Roth 2008). This species is known to occur in Quaternary age eolian-deposited sand sheets, sand dunes, and river terrace gravels.

Potential to occur in the Action Area: The project footprint contains approximately 10.5 acres of potential habitat for San Juan milkweed within the Dunes vegetation community type. This milkweed was encountered at four widely dispersed locations in Area IV North in 2004 (Ecosphere 2004a). None of these locations was within the 704 acres proposed to be mined in Area IV North.

5. Impacts Analysis on Federally Listed and Candidate Species

5.1 Species Eliminated from Detailed Evaluation

Based upon evaluation of the existing environmental baseline, habitat associations (Table 3-1 in Section 3.1), discussions with the NNDFW and the USFWS, and field surveys, the following species are eliminated from detailed evaluation in this BE due to an absence of habitat in the Action Area: Knowlton's cactus, Mancos milkvetch, Mesa Verde cactus, Mexican spotted owl, black-footed ferret, and Canada Lynx.

5.2 Species Warranting Detailed Evaluation

Based upon evaluation of the environmental baseline, habitat associations (Table 3-1), discussions with the NNDFW and the USFWS, and field surveys, there is no suitable habitat for any federally listed species to reside or breed within the Navajo Mine lease area, including within the areas proposed for mining in Areas IV North and III, and Areas I and II from associated mining activities. It is possible that the endangered southwestern willow flycatcher could land on a native or exotic tree within any of the ephemeral washes that traverse the Action Area during migration; albeit the potential is low due to the sparse migratory habitat available and the discountable number of willow flycatchers that may incidentally occur.

Where the Action Area extends to include a short reach (less than one mile) of the San Juan River, known and potential habitat for several federally listed species occur associated with habitats along and within the river system. In addition to breeding and migratory stopover habitat for the southwestern willow flycatcher, there is habitat and known occurrences of yellow-billed cuckoo and roundtail chub, and known occurrence and critical habitat for the Colorado pikeminnow and razorback sucker. The San Juan River is approximately 16 miles away from proposed mining in Area IV North and active mining in Area III, and approximately 3.3 miles from infrastructure- and transportation-related disturbances in Areas I and II. This analysis evaluates the potential impacts to these species while taking into account the environmental baseline relative to past consultations with the USFWS.

5.2.1 Southwestern Willow Flycatcher

Potential effects: None of the potential migratory stopover or breeding habitats described in Section 3.0 and 4.0 of this BE would be reduced in extent or modified by any activities within the Action Area. Potential impacts would be limited to indirect effects—such as noise from human or equipment activities—that could cause birds to flee or otherwise react to the disturbance. The greatest potential for this impact would be in the event that a flycatcher were to land on a tree within Cottonwood Arroyo—the closest marginal habitat to active and proposed mining in the Action Area—prior to a blast or during operation of a nearby dragline. Cottonwood Arroyo is approximately 165 feet from active mining in Area III and proposed mining in Area IV North.

Mining operations that would occur between May and mid-June and late-August to early September could have potential adverse effects to willow flycatchers that may incidentally be migrating through the Action Area. These effects could include avoidance of the area due to noise or human activity, including the generation of fugitive dust through the 2016 breeding season.

Noise levels are directly related to the distance from the nearest noise-sensitive receiver because noise levels diminish with increasing distance from the noise-generating activity. The highest constant noise levels from mining activity would be associated with coal removal—producing an estimated noise level of 83 dBA L_{eq} at 50 feet from operating equipment. This noise level rapidly dissipates with distance to a receptor. The nearest potential migratory stopover habitat along Cottonwood Arroyo is approximately 165 feet from this noise source. The estimated noise level associated with coal removal at this distance is 72.6 dBA L_{eq}, comparable to a gas-powered lawn mower at 100 feet.

Although blasting activities cause high instantaneous noise levels, measured at 94 dBA L_{max} at 300 feet from the blast and 99.1 dBA L_{max} at 165 feet, the duration of the noise is very brief, lasting only a few seconds. The influence of blasting activities to the overall noise environment is small when averaged over time for either the 1-hour L_{eq} or the 24-hour day-night average sound level (L_{dn}) noise metrics. Noise from a blast is the most likely noise that could elicit a flee response from a flycatcher that happens to be in the area. This is due to the fact that coal removal noise is near constant and thus, if a flycatcher were disturbed by that sound level, it would not likely perch in Cottonwood Arroyo. If present however, a blast could conceivably cause a flee response, which would be considered a discountable or negligible impact as it is simply a fright-flight response that would be exhibited by this species for a variety of reasons. With that said, it is well documented that flycatchers are not particularly sensitive to noise as evidenced by their frequent nesting along roadways and highways. Furthermore, this potential impact is greatly mitigated by the fact that riparian habitats for this species within or near the Action Area lack the structure, density and patch size preferred by this species. Therefore, the number of flycatcher potentially impacted by noise at Navajo Mine is discountable.

Fugitive dust or particulate matter (PM) is regulated by the Environmental Protection Agency (EPA) under the Clean Air Act. Secondary National Ambient Air Quality Standards for PM are established to protect, among other things, wildlife. Standards for PM less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$) are set at 150 and 35 micrograms per cubic meter. These standards are discussed in detail in the Air Quality sections of the EA prepared for this project. Air analyses completed for the project estimate $PM_{2.5}$ levels well below these standards and at similar magnitudes as is currently produced (environmental baseline) within the Action Area.

Mitigation Measures: BNCC is working with the USACE, USFWS, and the NNDFW to re-establish and enhance approximately 8 to 10 acres of emergent wetlands along the lower Chinde Wash within the Action Area (and mine permit area) as mitigation under the Clean Water Act for mining impacts to approximately 1.9 acres of ephemeral washes in Areas III and IV North and along the proposed Burnham Road realignment. The USACE and USFWS support the mitigation plan objectives, which are to replace ephemeral washes proposed to be impacted in Areas III and IV North with re-establishment and

enhancement of higher functioning wetlands along the lower Chinde Wash. The mitigation plan involves exotics and invasive species vegetation removal, riparian plantings of willow, cottonwood, alder, and privet, and enhancing wetlands as directed by the USACE. The plan is expected to increase site ecological function by establishing multi-story riparian habitats via tree and shrub plantings, and to eradicate exotic vegetation along the lower reach of the Chinde Wash. The mitigation plan is expected to benefit the flycatcher by increasing willow patch sizes and establishing structural connectivity between patches of native riparian woody vegetation. In the short term, following eradication of the exotic woody species (tamarisk and Russian olive), there will be a reduction in available migratory stopover habitat. This impact would only persist for 2 to 3 years before willow and cottonwood plantings establish. Following establishment of the native woody plantings, as described above, the species is expected to benefit from increased migratory and potential breeding habitat. A detailed description of the Lower Chinde Mitigation Plan is included in the USACE's 404(b)(1) alternatives analysis provided as Appendix A to the project EA.

Effects Determination: Given the potential for the incidental occurrence of migrating southwestern willow flycatchers to occur within Cottonwood Arroyo and to be disturbed by noise or human activity, the Proposed Action **may affect, is not likely to adversely affect** southwestern willow flycatchers. Following implementation of the mitigation plan described above, the Proposed Action is more likely to have a beneficial impact on the species.

5.2.2 Yellow-billed Cuckoo

Potential effects: The only potential for this species to occur in the Action Area is along the San Juan River corridor, approximately 16 miles north of proposed mining activities. The estimated noise level associated with mining activities at this distance is 18.7 dBA L_{eq}, nearly inaudible and comparable to a quiet rural night. Background ambient daytime sound levels in the Action area are between 30 to 35 dBA. Maximum levels associated with blasting at this distance are estimated at 45.2 dBA L_{max}, assuming there are no terrain shields or buffers between the source and the receptor. This noise level is comparable to the sound of a refrigerator running and lasts for several seconds. Terrain buffering exists as the habitat for this species is within the San Juan River floodplain, several hundred feet below the elevation where mining and blasting occurs. Additionally, the ambient noise along the San Juan River in the Action Area is undoubtedly louder due to the sounds of water running (the PNM diversion spillway is in the Action Area); wind traveling up the river valley; agricultural, industrial, and residential activities; an aggregate operation; and birds vocalizing and domestic dogs barking, among other background noises. Fugitive dust from mining activities is not expected to reach the San Juan River in any measurable concentrations based on the air modeling completed for the EA.

Determination of Effect: There would be no direct or indirect effects to potential habitat located along the San Juan River corridor. Given the distance to suitable habitat from the Proposed Action, no direct or indirect effects to yellow-billed cuckoo from mining operations resulting from noise, emissions, dust, or activity would occur. The Proposed Action would have **no effect** to yellow-billed cuckoo. Following

implementation of the mitigation plan described in Section 5.2.1, the Proposed Action may have a beneficial impact on the species.

5.2.3 Colorado Pikeminnow

Potential effects: Because the Proposed Action would predominately occur approximately 16 miles from the San Juan River and from designated critical habitat for this species, potential effects to the species are limited to potential adverse impacts to surface water quality and quantity. The nearest activity to pikeminnow habitat in the San Juan River is coal delivery. This activity is approximately 3 miles south of the river. Under the Proposed Action, coal delivery via the electric rail would be maintained at approximately current levels into 2016. The activity of coal delivery to FCPP has no potential to impact water quality or quantity in the San Juan River. Based on the results of surface and groundwater analyses completed in the project EA (refer to Section 4.2 of the EA), no direct or indirect effects to Colorado pikeminnow or designated critical habitat will result from the Proposed Action. Potential impacts to water quality and ongoing mitigation measures/regulatory requirements (i.e., stormwater management) in the Action Area are described below. More detailed descriptions of potential impacts to water resources are included in the EA and in the probable hydrologic consequences (PHC) mining (BNCC 2011a § 11.6). The EA and the PHC conclude that impacts to downstream (from Navajo Mine) water quality and quantity would be negligible as water quality impacts would be within the water quality observed in baseline fluctuations.

Ground disturbance associated with construction and mining has the potential to increase sediments reaching the San Juan River. BNCC mining construction and operations must comply with, in addition to CWA regulations, SMCRA regulations that require that surface-water runoff from constructed surfaces be controlled such as to “prevent[], to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow, or runoff outside the permit area” (30 CFR 816.41(d)(1)). The CWA also requires that discharges to streams meet all applicable water quality standards. OSM approval procedures for controlling sediment transport include berms, terraces, sediment ponds, and other energy dissipative channel structures that allow water to pond and sediment to accumulate.

All discharges from mining and mine-related disturbed areas are subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements. The largest source of potential runoff from the proposed mining operation is stormwater. All BNCC operations are conducted in accordance with an individual NPDES permit to cover possible discharges from the mine permit area. In addition, BNCC acquires general NPDES permits as applicable, such as the Multi-Sector General Permit (MSGP) under Sector H for coal mining (e.g., haul roads and access roads). Runoff from disturbed mining and reclamation areas is managed in evaporation ponds designed and certified by professional engineers to contain runoff from 10-year 24-hour storm events. Should discharges occur from these ponds, they would be subject to the appropriate NPDES discharge effluent limitations.

BNCC would not discharge any water not covered under the final rule 40 CFR Part 434 or the NPDES MSGP. Stormwater runoff that is not permitted under the MSGP within the mine site would be retained on site in sediment ponds until it evaporates or infiltrates. Retention of a majority of the stormwater would reduce impacts to downstream channels due to discharge from the mine site. Through the MSGP, the mine would be required to maintain a Storm Water Pollution Prevention Plan to mitigate potential impacts from discharges allowed under the permit. The mine site would be returned to approximate original contour during the reclamation process, as required by 30 CFR 816.102. This means discharge from the reclaimed mine site would be almost identical to pre-mine conditions. Consequently, there would be no impact on surface water quality of the San Juan and Chaco Rivers as a result of mine water discharges.

Surface water controls required by SMCRA regulations would result in containment of surface runoff from mining areas on the BNCC lease area. Sediment ponds are designed to detain water long enough to allow settling of suspended sediment, and surface-water impoundments retain water permanently. Use of sediment ponds would allow some amount of surface water to be lost, either through infiltration into the ground or evaporation from the surface. This lost surface flow represents a depletion of surface water quantity at the permit boundary, relative to the reaches of the local drainage system that are not under a sediment management system. Loss of runoff also occurs where many originally existing streams in the permit area are diverted from their channels in order to allow surface mine excavations and reclamation to proceed.

SEDCAD modeling of worst case impacts associated with full mine development of Area IV North indicate a 2 percent change in sediment yields and a 1 percent change in storm runoff downgradient of mining after reclamation in comparison with pre-mine conditions (BNCC 2011a § 11.6). Therefore, impact to Cottonwood Arroyo surface water runoff are considered to be negligible as they are less than 10 percent and considered to be within background levels.

The advance of the mine pit in Area IV North and continued mining in other areas would result in limited groundwater drawdown but is not expected to result in a drawdown of groundwater levels in the alluvium within the main stem of Cottonwood Arroyo (refer to the PHC), and consequently would have an immeasurable effect on the Chaco River or San Juan River alluvium in terms of water loss. In fact, mining in these areas would result in higher groundwater recharge rates during and following reclamation as a result of removal of the badland topography. The placement of topdressing materials within reclaimed areas would permit higher rates of infiltration and groundwater recharge relative to baseline conditions.

Although toxic metals are found in coal combustion byproducts (CCB) and mine spoils as well as in the overburden rock prior to mining, these materials do not exhibit the characteristics of extraction procedure toxicity and are non-hazardous according to the approved Resource Conservation and Recovery Act (RCRA) test at the time of the analysis (Appendix K of BNCC 2011). As it relates to groundwater quality, leaching tests of mine spoil and CCB materials were performed using surface water and groundwater as the leaching solution (OSM 2011). These leaching tests showed that total dissolved

solids (TDS) and sulfate concentrations are lower in saturated CCBs compared to saturated mine spoils. Arsenic, boron, fluoride, and selenium concentrations increased in fly ash leachate and showed higher concentrations in two CCB wells relative to concentrations in spoil wells. Leaching tests, however, show that arsenic, boron, and fluoride are all attenuated in flow through mine spoil. Arsenic and selenium are below detection limits of 0.005 milligrams per liter (mg/l) in spoil monitoring well Bitsui 5 and in most of the spoil leaching tests. Likewise, mercury concentrations are below the detection limit of 0.0002 mg/l in the composite water leaching tests (Appendix K of OSM 2011). As a result, the quality of groundwater that migrates from backfilled pits is not expected to measurably change in mine backfill, even in areas with CCB materials. No CCB disposal is proposed under the Proposed Action.

Based on estimates of groundwater flow velocities, the projected travel time from the mine to San Juan River alluvium at the Fruitland Formation subcrop is expected to be approximately 290 years from Area I, presumably longer from Area IV North. Measurable changes in groundwater quality reaching San Juan River alluvium would not occur (refer to the PHC). Furthermore, groundwater flow in the San Juan River alluvium is more than two orders of magnitude higher than groundwater flow estimated to be discharging to the alluvium from the Fruitland Formation.

The follow paragraphs describe water use and possible impacts to water quantity reaching the San Juan River. BNCC holds NMOSE (New Mexico Office of the State Engineer) Permit Number 2838 and associated groundwater Permit Number SJ-2917, which provides BNCC a total diversionary right of 51,600 acre-foot annually, with a consumptive right of 39,000 acre-foot annually, for waters drawn from the San Juan River. No change in consumptive use is anticipated from what is currently used to support mining operations. During surface coal mining operations, there will be a temporary reduction in surface water flows in the mined out drainages and from evaporation from stormwater retentions ponds and increased infiltration into the ground. These drainages, all ephemeral, are described in detail in the USACE's 404(b)(1) alternatives analysis provided as an attachment to the EA. Combined, there would be 1.9 acres of impact to these drainages. The small amount of water loss from evaporation would have no impact on water quantity or quality reaching the San Juan River (BNCC 2011 § 11.6).

In addition, the impact of this level of depletion on the water supply was considered in the Navajo Dam Operation Biological Opinion (USFWS 2006), and the full amount of BNCC's allowable diversion and consumption under Permit 2838 was included in the baseline for the analysis of that action.

Fugitive dust impacts from the Proposed Action were determined using the American Meteorological Society/EPA Regulatory Model—known as AERMOD—to quantify the extent to which particulate emissions from the Mine disperse and its effect on the ambient air quality. The dispersion model is discussed in detail in Section 3.5 of the EA. The EPA has defined the thresholds or significant impact levels (SILs) for PM_{10} to be 5.0 micrograms per liter ($\mu g/m^3$) (24-hour basis) and $PM_{2.5}$ to be 1.2 $\mu g/m^3$ (24-hour basis). The primary purpose of the SIL is to serve as a screening tool to identify a level of ambient impact that is sufficiently low relative to the National Ambient Air Quality Standards or "NAAQS" or prevention of significant deterioration (PSD) increments such that the impact can be considered trivial or *de minimis* (i.e., significantly below SILs) (Sutley 2010). According to dispersion

model results, the farthest extent of Navajo Mine's PM_{10} impact above the PM_{10} SIL, on a 24-hr basis, is located due north of the Mine at a distance of about 12.5 km from the center of the boundary separating Area III from Area IV. The dispersion model also showed the farthest extent of Navajo Mine's $PM_{2.5}$ impact above the $PM_{2.5}$ SIL, on a 24-hour basis, is about 15 km from the center of the boundary separating Area III from Area IV. The *de minimis* concentrations of PM from the Proposed Action in the vicinity of the San Juan River demonstrate that deposition, if any, and potential impacts from release of constituents (e.g., through dissolution) from deposited particles are below the levels that could reasonably be analyzed or detected.

Based on the summary above, and supported by the analysis in the EA and PHC, there would be no changes to constituent elements or parameters of critical habitat as a result of implementing the Proposed Action.

Determination of Effect: Because there would not be a measurable change in water quality or quantity reaching the San Juan River or any change in consumptive use of water at Navajo Mine, and because there would be no habitat modification or changes to constituent elements of designated critical habitat, the Proposed Action would have **no effect** on the Colorado pikeminnow. Implementation of the mitigation plan described in Section 5.2.1 would not measurably change water quality reaching the San Juan River or consequently this determination.

5.2.4 Razorback Sucker

Potential effects: Potential effects to this species and to designated critical habitat are the same as those described for the Colorado pikeminnow in Section 5.2.3.

Determination of Effect: Because there would not be a measurable change in water quality or quantity reaching the San Juan River, and because there would be no habitat modification or changes to constituent elements of designated critical habitat, the Proposed Action would have **no effect** on the razorback sucker. Implementation of the mitigation plan described in Section 5.2.1 would not measurably change water quality reaching the San Juan River or consequently this determination.

5.2.5 Roundtail Chub

Potential effects: Potential effects to this species are the same as those described for the Colorado pikeminnow in Section 5.2.3.

Determination of Effect: Because there would not be a measurable change in water quality or quantity reaching the San Juan River, the Proposed Action would have **no effect** on the roundtail chub. Implementation of the mitigation plan described in Section 5.2.1 would not measurably change water quality reaching the San Juan River or consequently this determination.

6. NAVAJO NATION SPECIES OF CONCERN

6.1 Species Eliminated from Detailed Evaluation

Based upon evaluation of the environmental baseline, habitat associations (Table 3-1 in Section 3.1), and field surveys, five of the 11 NNHP species of concern can be eliminated from detailed consideration. These species include the black-footed ferret, peregrine falcon, mountain plover, Mancos milkvetch, and Mesa Verde cactus.

6.2 Species Warranting Detailed Evaluation

Six of the NNHP species of concern have potential to occur within the Action Area. These species include the kit fox, southwestern willow flycatcher, golden eagle, ferruginous hawk, western burrowing owl, and San Juan milkweed. Western burrowing owl, ferruginous hawk, and golden eagle are known to occur in and around the Action Area. Southwestern willow flycatcher is addressed in Section 5.2.1. Impacts determinations in this section use terminology specified by the NNDFW.

6.2.1 Kit Fox

Potential Impacts: The Action Area provides potential and known habitat for kit fox. Kit fox would be expected to move through and/or forage within the Action Area on a year-round basis. The Proposed Action could result in long-term modification of approximately 704 acres of potential habitat in Area IV North, approximately 701 acres in Area III (currently permitted but not mined), and 75 acres associated with the realignment of Burnham Road. Abundant suitable habitat for kit fox occurs within the Action Area outside the project footprint and extends to California and Oregon, and to Texas and northern Mexico. The impact to approximately 1,500 acres of habitat for this species represents a worst-case temporary displacement of only a few individuals because kit fox have been documented as using reclaimed areas of the mine. Direct and indirect impacts to kit fox habitat would be low and long term because of the hundreds of square miles of habitat for this species in the west. This conclusion is validated by the frequent sightings of kit fox in the Action Area, even after 50 years of mining and ongoing mining.

Fugitive dust, noise, and human activities associated with mining activities could also directly impact kit fox. Noise levels resulting from normal mining activities in the Action Area would range from 83 dBA L_{eq} adjacent to mining activities to 42.5 dBA L_{eq} 1 mile from active pits. Potential impacts from fugitive dust would be reduced through sprinkling of water during mining operations and other mitigation measures in accordance with BNCC's Fugitive Dust Control Plan. Although kit fox may be exposed to noise and increased levels of fugitive dust near mining or construction operations, these impacts are not expected to result in adverse effects since this highly mobile species is expected to move out of the immediate mine area into suitable adjacent habitat.

Impacts may include avoidance of active mining areas and transportation corridors, and coal stockpile areas where human and vehicle activity is high and nearly constant. The potential for mortality resulting

from vehicular collisions is also a possibility. The potential for vehicular mortality would be low and long term. Under the Proposed Action, the potential for these effects would not increase over current conditions; however, spatially these effects would extend into Area IV North and into the area of the Burnham Road realignment from where they are currently occurring. However, while mining would continue in Area III and resume in Area IV North, contemporaneous reclamation also continues.

Impact Determination: Although individual kit foxes could be impacted from the Proposed Action, no population level impacts are expected. **Impacts are not likely to result in a loss of species viability range-wide.**

6.2.2 Golden Eagle

Potential Impacts: Approximately 1,500 acres of potential foraging habitat for golden eagles would be disturbed and modified by the Proposed Project. There would be no direct impacts to potential nesting habitat. Should golden eagles attempt to nest within the Action Area, it is possible that they are periodically disturbed by noise and human activity if they are close enough to these disturbances to cause alarm. Conversely, as noise generated from active mining is near constant at Navajo Mine, nesting in the area would indicate that eagles are not avoiding the area due to noise. Impacts resulting from the modification of foraging habitat would be low and long term.

Direct impacts to individual eagles may include avoidance of the Action Area due to mining activity, noise, and human presence. Avoidance impacts to golden eagles from mining and reclamation operations would be low and short to long term. Electric powerlines utilized for the Proposed Action have been constructed using the Navajo Nation Raptor Electrocution Prevention Regulations (NNHP 2008).

Impact Determination: No impacts to nesting golden eagles are expected to occur under the Proposed Action. No population level impacts to golden eagles are expected to result from implementation of the Proposed Action. **Impacts are not likely to result in a loss of species viability range-wide.**

6.2.3 Ferruginous Hawk

Potential Impacts: BNCC would follow the Navajo Nation's *Ferruginous Hawk Management Guidelines,* which are provided as Attachment C. No active or inactive ferruginous hawk nests occur within 1 mile of proposed mining in Area III or Area IV North; therefore, no seasonal restriction on activities would be applicable. Monitoring of ferruginous hawk nests—as required under the SMCRA and coordinated with the NNDFW—would continue to occur.

Direct impacts to ferruginous hawks from the Proposed Action would include the modification of an approximately 1,500 acres of potential foraging habitat. Once reclaimed, mined areas would once again support prey species for ferruginous hawk. Contemporaneous reclamation mitigates the incremental loss of foraging habitat. Impacts to foraging habitat would be low and short to long term. There would be a long-term loss of approximately 23 acres associated with the permanent surface of Burnham Road.

Badland habitats within Area IV North provide potential nesting habitat for ferruginous hawks. Approximately 689 acres of badlands would be permanently modified by development of the Proposed Action, resulting in a loss of potential nesting habitat for ferruginous hawk. Ferruginous hawks have not utilized these badlands for nesting since raptor monitoring was implemented at the mine in 1993. Given the abundance of suitable nesting habitat within the Action Area and surrounding region, impacts from habitat loss would be low and long term.

Ferruginous hawks may avoid the Action Area during mining activities due to noise associated with human activity, blasting, machinery operation, and vehicular traffic. Impacts from avoidance would be low and short term for the duration of mining and reclamation activities. The ferruginous hawk population monitored by BNCC and the NNDFW has been relatively constant and stable since annual raptor monitoring was initiated. Electric powerlines utilized for the Proposed Action have been constructed using the Navajo Nation Raptor Electrocution Prevention Regulations (NNHP 2008).

Impact Determination: No population level impacts to ferruginous hawks are expected to result from implementation of the Proposed Action. **Impacts are not likely to result in a loss of species viability range-wide**.

6.2.4 Western Burrowing Owl

Potential Impacts: Approximately 73 acres of potential nesting habitat (prairie dog towns) would be removed and modified under the Proposed Action. Given the abundance of suitable nesting habitat in the Action Area and surrounding region, this would result in a minor reduction in burrowing owl nesting habitat. Once mining and reclamation has been completed, prairie dogs and other small to medium sized mammals would be expected to return to the area. Direct impacts from habitat modification would be low and long term.

Fugitive dust as a result of mining activities could also directly impact burrowing owls by impairing visibility while hunting. Burrowing owls that may pass through the area incidentally would likely avoid the portion of the Action Area subject to active mining and reclamation activities. Impacts from avoidance would be low and short to long term.

Impact Determination: Although individual burrowing owls may be impacted, no population level impacts to this species are expected to result from implementation of the Proposed Action. **Impacts are not likely to result in a loss of species viability range-wide.**

6.2.5 San Juan Milkweed

Potential Impacts: San Juan milkweed has been recorded as occurring within Area IV North. Approximately 10.5 acres of potential and possibly occupied habitat would be removed for mining operations and modified during reclamation efforts, resulting in long-term impacts. The Proposed Action would also affect only a limited portion of the species range. According to the New Mexico Rare Plant

Technical Council, this species is never abundant at any one location. As a result, loss of individuals within the 10.5 acres of suitable habitat, if present, would not affect the species range-wide.

Impact Determination: Given the abundance of suitable habitat within this species distribution, habitat loss under the Proposed Action would result in impacts to individuals, but would not be expected to result in population level impacts. **Impacts are not likely to result in a loss of species viability range-wide.**

6.3 Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions on endangered or threatened species or critical habitat that are reasonably certain to occur in the foreseeable future in the Action Area. Future federal actions that are unrelated to the Proposed Action are not considered in this section because they require separate consultation pursuant to Section 7 of the Endangered Species Act. Of the federally listed species considered in detail in this BE, only the southwestern willow flycatcher has the potential, albeit slight, to be adversely affected by the Proposed Action. Potential impacts are limited to birds in migration using ephemeral washes as stopover habitat.

Within the Action Area, cumulative effects to the flycatcher would result from human activities, wildfire, and potential climate change. Human activities may adversely impact the flycatcher by decreasing the amount and suitability of migratory stopover habitat that occurs in ephemeral washes in the Action Area. The removal of non-native vegetation, such as tamarisk and Russian olive, can adversely affect the amount of available flycatcher migratory stopover habitat in the short term. Intentional burning of tamarisk or wildfires along ephemeral washes in the Action Area has the potential to destroy migratory stopover habitat.

Climate change, particularly warmer spring weather, and prolonged droughts in the Action Area would cause higher evaporation rates, which may reduce the amount of runoff reaching ephemeral washes in the Action Area. This drying out may reduce the amount of woody riparian vegetation available to flycatcher in the Action Area.

7. Determination of Effects

7.1 Federally Listed Species

Effects to federally listed species resulting from the Proposed Action are summarized in Table 7-1 below.

Table 7-1 Determination of Effects on Federally Listed Species.

Species	Preliminary Determination of Effect
Black-footed ferret	No Effect
Canada lynx	No Effect
Mexican spotted owl	No Effect
Southwestern willow flycatcher	May affect, not likely to adversely affect
Yellow-billed cuckoo	No Effect
Colorado pikeminnow	No Effect
Razorback sucker	No Effect
Roundtail chub	No Effect
Knowlton's cactus	No Effect
Mancos milkvetch	No Effect
Mesa Verde cactus	No Effect

7.2 Navajo Nation Natural Heritage Program Species of Concern

Impacts to Navajo Nation listed species resulting from the Proposed Action are summarized in Table 7-2 below. Those species dually listed under the federal ESA are addressed above in Table 7-1.

Table 7-2 Impacts to Navajo Nation Listed Species.

Species	Preliminary Determination of Effect
Black-footed ferret	No Impacts
Kit fox	May Impact Individuals
Ferruginous hawk	May Impact Individuals
Golden eagle	May Impact Individuals
American peregrine falcon	No Impacts
Mountain plover	No Impacts
Western burrowing owl	May Impact Individuals

Species	Preliminary Determination of Effect
San Juan milkweed	May Impact Individuals

7.3 Species Protected Under the Migratory Bird Treaty Act

Under the MBTA (16 USC §703-712) and Executive Order 13186, federal agencies are required to consider management impacts to migratory birds. While all migratory songbirds are protected by law, certain species have been determined to be at greater risk than others. There are over 350 avian species in San Juan County and the surrounding area. A total of 136 species have been confirmed as breeding in San Juan County with likely additional species if one considers the adjacent counties. Data collected through breeding bird surveys coordinated by the USFWS, as well as other private sector efforts, have provided the basis for the Partners in Flight (PIF) organization to develop bird "Watch Lists" and the USFWS "Birds of Conservation Concern List."

Approximately 1,500 acres of previously disturbed and undisturbed vegetation could be modified by the development of the Proposed Action. Vegetation removal and mining activities would result in a long-term loss of habitat for a variety of ground- and shrub-nesting birds protected under the MBTA. Additionally, noise and human disturbance may cause some nest abandonment in adjacent areas.

8. MITIGATION

The following mitigation measures would be implemented under the Proposed Action, if approved.

- The NNDFW NNHP's Ferruginous Hawk Nest Protection Guidelines would be followed.
- Implementation of BNCC's Fugitive Dust Control Plan.
- Adherence to the BNCC's Stormwater Pollution Prevention Plan and NPDES Permit.
- Confining activities and equipment to the Navajo Mine lease area to reduce disturbance to area wildlife and wildlife habitat.
- During activities, any spilled petroleum products would be cleaned up immediately. Should petroleum be absorbed into the soil, the stained area would be shoveled out and disposed of at an approved disposal site.
- Conduct vegetation clearing outside of the migratory bird breeding season (e.g., clear vegetation during winter months).
- Continue annual wildlife monitoring at Navajo Mine and ongoing coordination with NNDFW and OSM regarding ways to improve monitoring.

9. CERTIFICATION

It is believed by Ecosphere that the Proposed Action would not violate any of the provisions of the Endangered Species Act of 1973 as amended or Navajo Nation code (NNC) requirements for endangered species (17 NNC 507). Conclusions of this report are based on actual field examination and are correct to the best of my knowledge.

_____

Mike Fitzgerald
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10. PERSONNEL

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Fruitland, NM 87416

12. REFERENCE MATERIALS AND LITERATURE CITED

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ATTACHMENT A

MAPS

FIGURE 1: PROPOSED ACTIVITIES

FIGURE 2: LOCATION MAP

FIGURE 3: ACTION AREA

Figure 1. Proposed Activities

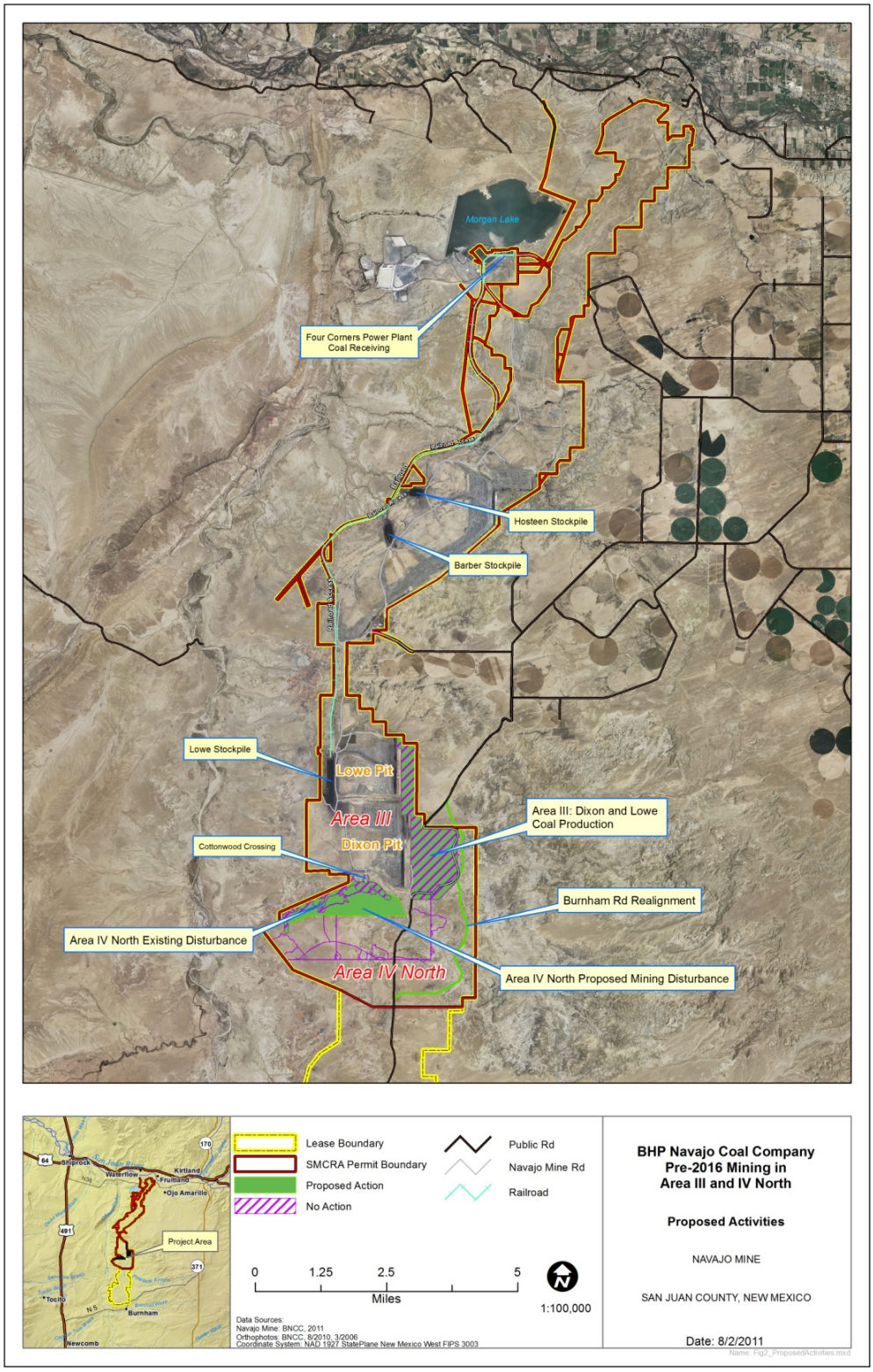


Figure 2. Location Map

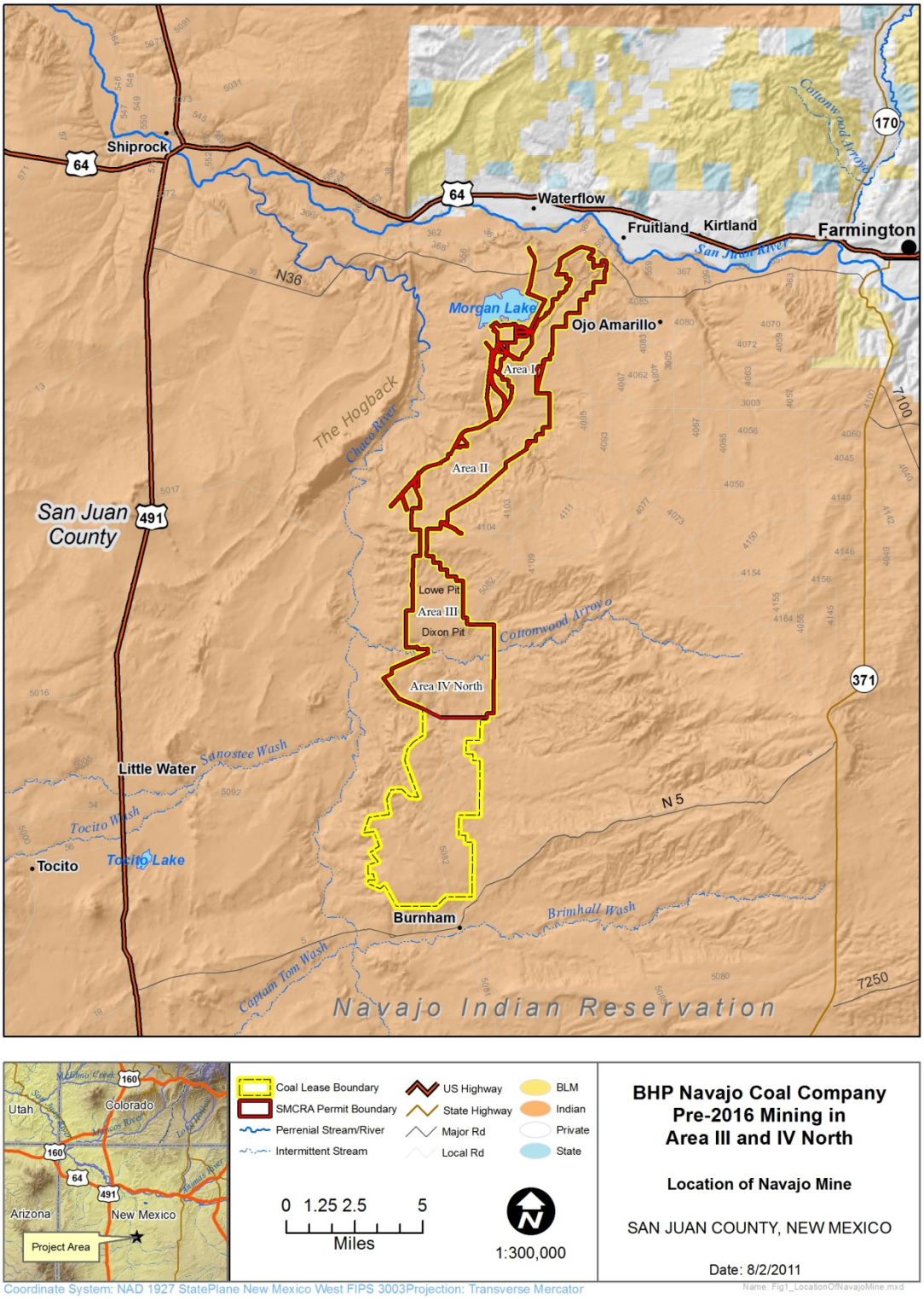
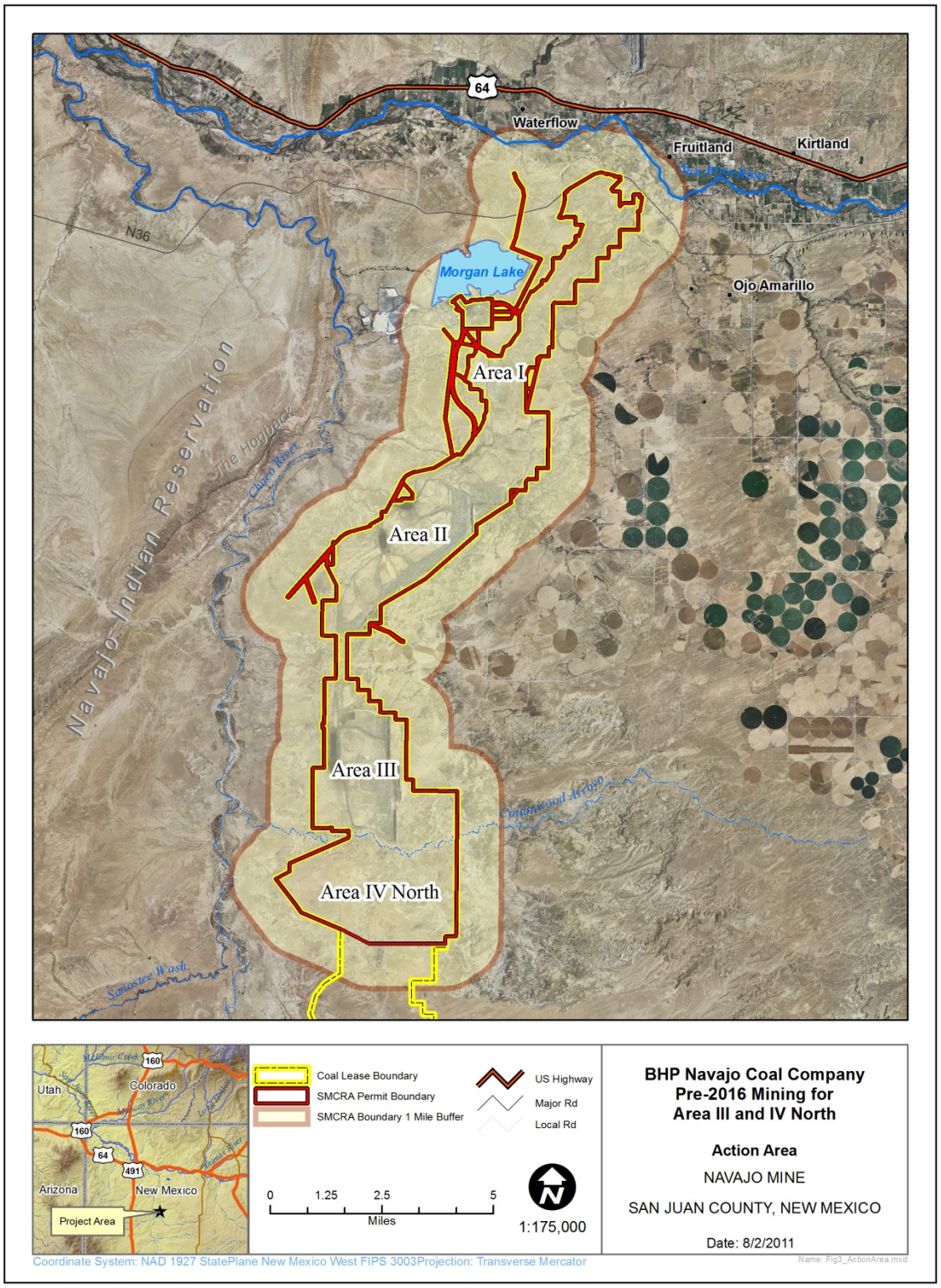


Figure 3. Action Area



ATTACHMENT B
U.S. FISH AND WILDLIFE SERVICE AND NAVAJO NATION NATURAL HERITAGE PROGRAM DATA REQUEST/COORDINATION CORRESPONDENCES

Mike Fitzgerald <fitz@ecosphere-services.com>
05/09/2011 11:30 AM

To "David_Campbell@fws.gov" <David_Campbell@fws.gov>
cc "Steele, Brenda" <BSteele@osmre.gov>, "csmith@nndfw.org" <csmith@nndfw.org>, "Cummings, Deanna L SPA" <Deanna.L.Cummings@usace.army.mil>, "harrilene.yazzie@bia.gov" <harrilene.yazzie@bia.gov>, "dlscott@blm.gov" <dlscott@blm.gov>, "Applegate, Kent KC" <Kent.KC.Applegate@bhpbilliton.com>
Subject USFWS Data Request

Dave,

Please see the attached species data request letter. Let me know when is a good time for me to call you and I'll provide you with some background.

Mike Fitzgerald | Principal
(p) 970.382.7256 (c) 970.759.4830 | 776 E. Second Ave. Durango, CO 81301

Ecosphere
Environmental Services

From: George_Dennis@fws.gov [mailto:George_Dennis@fws.gov]
Sent: Thursday, May 19, 2011 11:58 AM
To: Mike Fitzgerald
Cc: David_Campbell@fws.gov
Subject: Re: Fw: USFWS Data Request Navajo Mine

Mr. Fitzgerald:

You can find the latest species list for the county where the mine is located at http://www.fws.gov/southwest/es/NewMexico/SBC.cfm. Please provide a review and assessment for all the species on the county list. Of particular interest to the Service would be

the status of prairie dog town mentioned in our September 30, 2005 letter;

is suitable habitat for the three listed plants, Mancos milk-vetch, Knowltons cactus, and Mesa Verde cactus, present? If so, survey for the species.

indirect effects of sedimentation and water withdrawal on the Colorado pikeminnow and razorback sucker.

Please feel free to call if you have any questions.

Regards,
George Dennis

George D. Dennis III, Ph.D.
Aquatic Ecosystems Branch Chief
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, NM 87113-1001
505.761.4754
george_dennis@fws.gov

David Campbell/R2/FWS/DOI
05/09/2011 01:23 PM

To George Dennis/R2/FWS/DOI@FWS
cc
Subject Fw: USFWS Data Request

This should have gone to you.

Ecosphere
Environmental Services

Durango, CO
Cortez, CO
Pagosa Springs, CO
Farmington, NM

May 9, 2011

Dave Campbell
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, NM 87113

RE: Request for USFWS Listed Species with Potential to Occur Within the BHP Navajo Coal Company's Navajo Mine

Dear Mr. Campbell:

This letter is a request to your office for the current list of U.S. Fish and Wildlife Service (USFWS) listed species with potential to occur in/near the BHP Navajo Coal Company's (BNCC) Navajo Mine, including portions of Area III and Area IV North. The project area, shown on the attached maps, is entirely within existing BNCC lease area within San Juan County. The purpose of the request is to utilize the most updated information in order to prepare a biological evaluation as is required by the Biological Survey Services Program (BSSP), a program within the Navajo Fish and Wildlife Department (NFWD), to comply with requirements of the Federal Endangered Species Act, and to prepare an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) as required by the Office of Surface Mining (OSM).

As background, on February 15, 2011, BNCC submitted a Revised Area IV North Mine Plan to the Office of Surface Mining (OSM). The proposed mine plan revision seeks approval from OSM on how and when to mine approximately 800 acres of land including the mining area, ancillary facilities such as maintenance roads and electric lines, and the relocation of Burnham Road within the currently permitted mine area. Mining in this portion of Area IV North has been previously authorized by OSM. In fact, all of the currently proposed disturbance areas were addressed in previous NEPA documents and biological evaluations, and received Navajo Nation and USFWS concurrence on previous listed and sensitive species effect determinations (see attached USFWS concurrence).

However, in November 2010, the U.S. District Court for the District of Colorado issued a decision vacating OSM's 2005 approval of BNCC's Area IV North mine plan which proposed mine development on approximately 3,800 acres in Area IV North, and instructed OSM to prepare a new EA. Ecosphere is the third-party contractor and is currently preparing the EA under OSM's direction. Because a new EA is being prepared, BNCC decided to submit an application to consolidate several current U.S. Army Corps of Engineer (USACE) Nationwide

Permits (NWP) into a single Navajo Mine Individual Permit (IP). Accordingly, the OSM and USACE are cooperating on the preparation of the EA. Based on recent agency status report conference calls, each of these agencies will be contacting your office for concurrence with the findings in the Biological Evaluation being prepared for the NFWD, likely in late May.

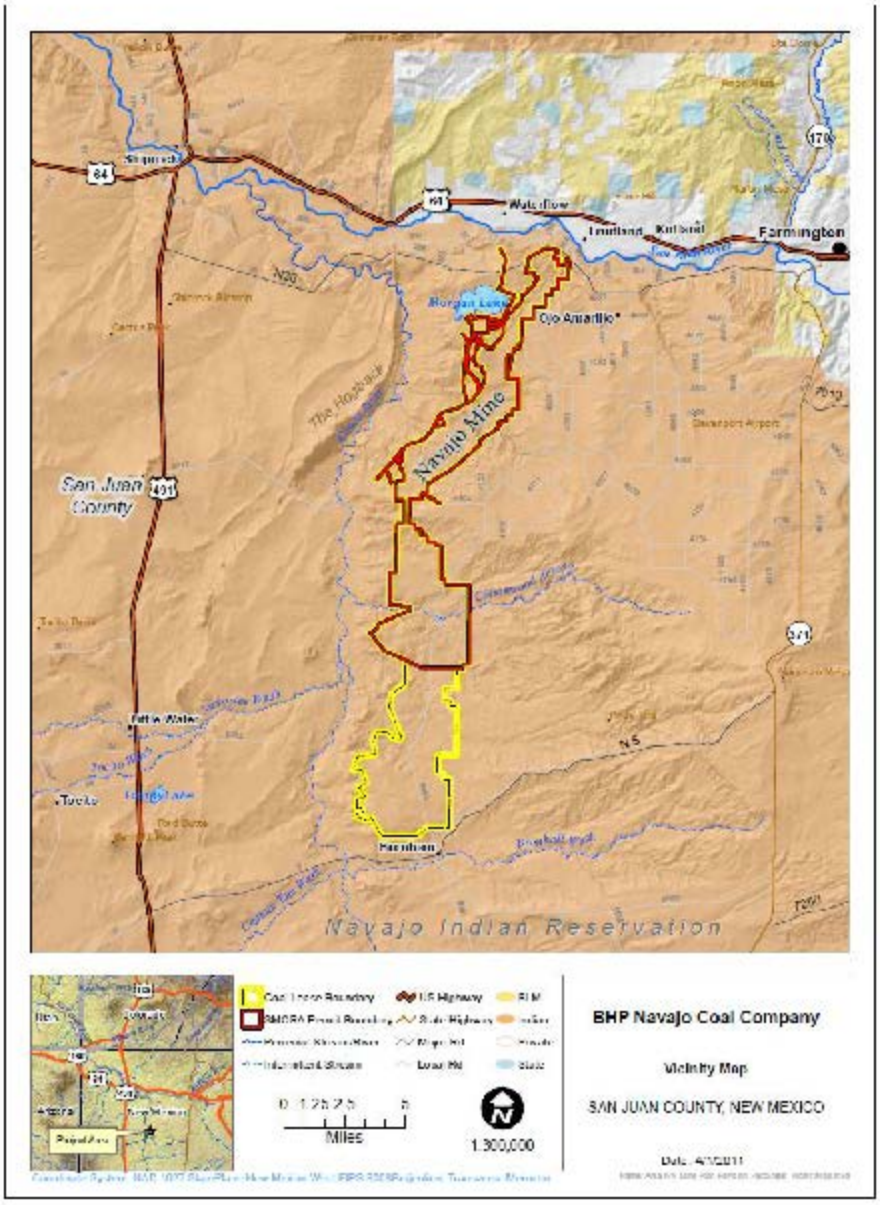
Thank you for your attention to this request. Please contact me if you have any questions.

Sincerely,

Mike Fitzgerald
Principal

Enclosure: Vicinity Map and Project Area Map
2005 USFWS Concurrence Letter

CC: Brenda Steele, OSM
Deanna Cummings, ACOE
Kent Applegate, BNCC


Farmington
Navajo Mine
San Juan County
Navajo Indian Reservation
Miles
1:300,000
BHP Navajo Coal Company
Vicinity Map
SAN JUAN COUNTY, NEW MEXICO

05-10-06-04

United States Department of the Interior

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

SEP 30 2005

Cons. #2-22-04-I-523b

Memorandum

To: Mine Coordinator, Navajo Mine Team, Office of Surface Mining, Reclamation and Enforcement, Denver, Colorado

From: Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Request for Concurrence on a Proposed Permit Revision on Area IV North for the Navajo Mine OSM Project Number NM-0003F

This responds to your March 7, 2005, wildlife baseline report and letter requesting concurrence for the effects from the proposed permit revision to add 3,800 acres of additional surface disturbance (known as Area IV North) to the Navajo Mine on the Navajo Nation. The Office of Surface Mining (OSM) determined that the proposed action "may affect, but is not likely to adversely affect" the bald eagle (*Haliaeetus leucocephalus*), black-footed ferret (*Mustela nigripes*), Mexican spotted owl (*Strix occidentalis lucida*) (MSO), and southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher). You requested concurrence with your determination that the proposed action is "not likely to jeopardize" the continued existence of the yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo).

The proposed action would disturb about 1,800 of the additional 3,800 acres of surface land. BHP Navajo Coal Company has applied for an extension to their existing permit. They are proposing to revise the existing permit to allow the disturbance of about 1,800 of 3,800 acres of surface land in Area IV North. They are also proposing to construct a primary haul route over Cottonwood Wash to transport coal north to their existing train loadout facilities.

Based on the information you provided and other information available to the Service, we concur with your determinations for the following reasons:

- There is no suitable habitat for the cuckoo, MSO, or flycatcher;
- The size of the prairie dog town was less than 4 hectare, which is too small to support black-footed ferrets; and

- Although individuals may migrate through the area, bald eagle habitat does not occur on-site.

For these reasons, the effects of your proposed action are considered insignificant and discountable. Therefore, the Service concludes that the proposed action "may affect, is not likely to adversely affect" the bald eagle, black-footed ferret, Mexican spotted owl, and flycatcher. We also concur that the proposed action is "not likely to jeopardize" the continued existence of the cuckoo. There is no designated critical habitat in the project area. Therefore, none will be affected by this propose project.

Please contact the Service if: 1) future surveys detect listed or proposed species in habitats where they have not been previously observed; 2) the livestock grazing project is changed or new information reveals effects of the proposal to listed species that have not been considered in this analysis; or 3) a new species is listed or critical habitat designated that may be affected by the action.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. In future correspondence regarding this project, please refer to consultation # 02-22-04-I-523b.

Susan MacMullin

Susan MacMullin

4801 N. Butler, Suite 15101 Farmington, NM 87401 • 505.327.3088 (p) • 505.327.9546

Ecosphere
Environmental Services

Durango, CO
Cortez, CO
Pagosa Springs, CO
Farmington, NM

March 14, 2011

Sonja Detsoi, Data Manager
Navajo Department of Fish and Wildlife
Natural Heritage Program
P.O. Box 1480
Window Rock, AZ 86515

RE: Request for Navajo Nation Listed Species with Potential to Occur Within the BHP Navajo Coal Company Proposed Area IV North Mine Plan Revision Project Area

Dear Ms. Detsoi:

This letter is an updated request for data on the occurrence or potential occurrence of species of concern in the BHP Navajo Coal Company's (BNCC) Area IV North Mine Plan Revision project area. The purpose of the request is to utilize the most updated information in order to prepare a biological evaluation as is required by the Biological Survey Services Program (BSSP), a program within the Navajo Fish and Wildlife Department (NFWD).

This Data Request updates and corrects the previous request from Joey Herring of my staff dated January 20, 2011. Specifically, we correct the project name noted above, and provide updated information on the disturbance area. Since our January 20, 2011 letter, BNCC has refined project details and submitted its mine plan revision application to Office of Surface Mining and Reclamation (OSM). The area of disturbance is now estimated to be approximately 800 acres including the Area IV North mining area, ancillary facilities such as maintenance roads and electric lines, and the relocation of Burnham Road. Enclosed please find corrected maps for your reference.

Please provide a response letter with an updated species list based on this corrected and updated information. Thank you for your assistance. Please contact me if you have any questions regarding this request.

Sincerely,

Mike Fitzgerald
Principal

Enclosure: Vicinity Map and Project Area Map

CC: Brenda Steele, OSM
Deanna Cummings, ACOE
Kent Applegate, BNCC

4801 N. Butler, Suite 15101 Farmington, NM 87401 ▪ 505.327.3088 (p) ▪ 505.327.9546

THE
NAVAJO
NATION

Ben Shelly,
PRESIDENT
Rex Lee Jim
VICE PRESIDENT

Dept of Fish & Wildlife • P.O. Box 1480 • Window Rock, AZ 86515 • (928) 871-6451 • Fax (928) 871-7069

31 March 2011

File#11EES02

Mike Fitzgerald, Principal
Ecosphere Environmental Services
4801 N. Butler
Suite 15101
Farmington, NM 87401

SUBJECT: BHP NAVAJO COAL COMPANY PROPOSED AREA IV NORTH MINE
PLAN REVISION PROJECT AREA
LEGAL DESCRIPTION
T27N, R15W, SEC. 30 & 31; T26N, R15W, SEC. 6, 7 & 18;
T26N, R16W, SEC. 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15 & 16
BURNHAM, SAN JUAN COUNTY, NM

Mr. Fitzgerald:

The following information on species of concern[1] is provided in response to your 14 March 2011 request concerning the subject project, which consists of the BHP Navajo Coal Company Proposed Area IV North Mine Plan Revision Project Area. The area of disturbance is estimated to be approximately 800 acres including the Area IV North mining area, ancillary facilities such as maintenance roads and electric lines, and the relocation of Burnham Road. The legal description for the propose project is: T27N, R15W, Sections 30 & 31; T26N, R15W, Sections 6, 7, & 18; T26N, R16W, Sections 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15 & 16, San Juan County, NM.

Known to occur within one mile of the project site:
1. Athene cunicularia (Western Burrowing Owl); NESL Group 4; MBTA.
2. Aquila chrysaetos (Golden Eagle); NESL group 3; MBTA; EPA.

Species of concern with potential to occur on the 7.5-minute *The Hogback South, NM* quadrangle(s) containing the project boundaries include the following. Potential is based primarily on quadrangle-wide coarse habitat characteristics and species range information. Your project biologist should determine habitat suitability at the project site(s).

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[1] "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 each species, the following tribal and federal statuses are indicated: Navajo Endangered Species List (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 or NESL group 4 status; please be aware of these species during surveys and inform the NFWD of observations. Documentation that these species are more numerous or widespread than currently known, and addressing these species in project planning and management is important for conservation and may contribute to ensuring they will not be uplisted in the future. Species without ESA or NESL legal protection (e.g., NESL group 4 species) are only included in responses on a regular basis and may not be included in this response. Please refer to the NESL for a list of group 4 species; contact me if you need a copy.

habitat suitability at the project site(s).

1. Aquila chrysaetos (Golden Eagle); NESL group 3; MBTA; EPA.
2. Buteo regalis (Ferruginous Hawk); NESL group 3; MBTA.
3. Charadrius montanus (Mountain Plover); NESL group 4; ESA proposed threatened; MBTA.
4. Dipodomys spectabilis (banner-tailed kangaroo rat); NESL Group 4.
5. Empidonax traillii extimus (Southwestern Willow Flycatcher); NESL group 2; ESA endangered; MBTA.
6. Falco peregrinus (Peregrine Falcon); NESL group 4: MBTA.
7. Mustela nigripes (Black-footed Ferret); NESL group 2; ESA endangered.
8. Vulpes macrotis (Kit Fox); NESL group 4.
9. Astragalus humillimus (Mancos Milk-vetch); NESL group 2; ESA endangered.

AREA 2: MODERATELY SENSITIVE WILDLIFE RESOURCES
AREA 3: LOW SENSITIVITY WILDLIFE RESOURCES

Potential for the black-footed ferret should be evaluated if prairie-dog towns of sufficient size (per NFWD guidelines) occur in the project area.

Potential for Puccinellia parishii should be evaluated if wetland conditions exists that contain white alkaline crusts.

Biological surveys need to be conducted during the appropriate season to ensure they are complete and accurate please refer to NN Species Accounts.[4] Further questions pertaining to surveys should be referred to Species Account. Surveyors on the Navajo Nation must be permitted by the Director, NFWD. Contact Jeff Cole at (928) 871-7068 for permitting procedures. Questions pertaining to surveys should be directed to the NFWD Zoologist (David Mikesic) for animals at 871-7070. Questions regarding biological evaluations should be directed to Pamela Kyselka (Acting Environmental Reviewer) at 871-7065.

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.

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 NFWD's Natural Heritage Program (NHP) office, or may be purchased through the U.S. Geological Survey (order forms are available through the NHP). The NHP 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.

The information in this report was identified by the NFWD's biologists and computerized database, and is based on data available at the time of this response. If project planning takes more than two (02) years from the date of this response, verification of the information provided herein is strongly recommended. It

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[4] Available free of charge on our website at http://nnhp.navajofishandwildlife.org/

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 NFWD's information is continually updated, any given information response is only wholly appropriate for its respective request.

For a list of sensitive species on the Navajo Nation in addition to the species listed on the Navajo Endangered Species List (NESL) please refer to our website at www.nndfw.org.

An invoice for this information is attached.

If you have any questions I may be reached at (928) 871-6472.

Sonja Detsoi, Wildlife Tech.
Natural Heritage Program
Department of Fish and Wildlife

xc: file/chrono

ATTACHMENT C
FERRUGINOUS HAWK MANAGEMENT GUIDELINES

Author: D.Mikesic, Zoologist
Navajo Natural Heritage Program
Department of Fish and Wildlife
dmikesic@navajofishandwildlife.org

FERRUGINOUS HAWK MANAGEMENT GUIDELINES

- Human land-use practices can have a variety of types of impacts to nesting Ferruginous Hawks and their habitats, including:
    1. Direct, Indirect, and Cumulative Impacts to nesting success and adult survival;
    2. Direct, Indirect, Cumulative Impacts to nesting and foraging habitat and prey densities.
- The purpose of these Management Guidelines is to conserve breeding Ferruginous Hawks on the Navajo Nation by protecting their nests from human activities that may cause temporary or permanent disturbance. Conservation of nesting Ferruginous Hawks is important to the Navajo Nation because it is:
    1. A species of cultural importance to the Navajo People;
    2. An important part of the ecosystem as a predator on small mammals;
    3. A native breeding species of the Navajo Nation, but occurs in low numbers as to be considered 'threatened' on the Navajo Endangered Species List (Group 3);
    4. Of concern to other land managers throughout much of its range, and therefore listed on numerous 'Species of Concern' lists for the western U.S. and Canada;
    5. A species that was once considered for Federal listing under the Endangered Species Act, and may be petitioned for listing again in the near future.
- Protection of both occupied and unoccupied nests is important because:
    1. Not all adult raptor pairs breed every year;
    2. Not all nesting territories are used for breeding each year;
    3. Each intact nest within a nesting territory may be used in any given year;
    4. Nesting territories may be reoccupied, and nests may be re-built and used, even if left unattended for a number of years.
- These Management Guidelines are designed to:
    1. Avoid disturbance to occupied nests during the breeding season;
    2. Avoid or minimize impacts to known or potential nesting habitats, especially in consideration of nesting substrate quality and quantity;
    3. Avoid or minimize impacts to foraging habitats around occupied nesting habitat; especially in consideration of prey diversity and densities;
    4. Minimize impacts over broad areas of the hawk's range on the Navajo Nation;
    5. Mitigate for unavoidable losses of nesting sites or habitat quality.

Author: D.Mikesic, Zoologist
Navajo Natural Heritage Program
Department of Fish and Wildlife
dmikesic@navajofishandwildlife.org

Definitions

'BRIEF ACTIVITIES' are those that occur for up to one (1) hour and involve only personnel and passenger or maintenance vehicles.

Examples include: soil surveys, biological surveys, infrequent maintenance of structures.

'LIGHT ACTIVITIES' are those that occur for up to one (1) day in the same general area (i.e. within 1,000 ft of the previous day's action), and involve up to five (5) vehicles (including up to three (3) construction-type vehicles or equipment), and up to ten (10) personnel.

Examples include: residential utilities (power, water and sewer lines), fence building.

'HEAVY ACTIVITIES' are those that exceed at least one of the criteria for Light Construction, or include permanent structures that involve human activity of up to one (1) visit per week.

Examples include: road construction, oil and gas well construction.

'LOUD ACTIVITIES' are those that exceed the normal base level of construction noise, either for brief or extended periods.

Examples include: blasting, jackhammer, rock crusher.

'PERMANENT STRUCTURES' are above-ground facilities resulting that persist for more than two (2) years in the same location.

'DAILY-USE' involves human activity that occurs daily or more than three (3) days a week. Examples include: home sites, sheep camps, subdivisions, coal mines, new roads, some road improvements, gas plants, large-scale farming, borrow pits.

'INFREQUENT-USE' involves human activity that occurs three (3) or less days a week.

Examples include: maintenance of oil and gas wells or utilities.

'NEST(S)' is a stick structure verified to, or likely to, have been built by Ferruginous Hawks, based on its characteristics of composition and placement on the substrate.

'OCCUPIED NESTS' are those nests which are repaired, tended, or used for nesting, in the current year by a pair of Ferruginous Hawks. The presence of Ferruginous Hawks (adults, eggs, or young), evidence of nest repair or nest marking, freshly molted feathers, or current years' mute suggest an Occupied Nesting

Territory. All nests within an Occupied Nesting Territory are considered as an "Occupied Nest" during pair-bonding and prior to egg-laying. If a nest is selected and eggs are laid, then only this nest will be considered as "occupied," while the others will then be considered 'unoccupied.' An Occupied Nest retains this status from pair bonding, through egg-laying, incubation of eggs, brooding and fledging of young, and post-fledging dependency of the young.

'UNOCCUPIED NESTS' are those nests not selected by Ferruginous Hawks for breeding in the current year. All nests without eggs or nestlings by May 1st of each year shall be considered as Unoccupied Nests. All nests during the non-breeding season (August 1st to February 28th) shall be considered as Unoccupied Nests.

'OCCUPIED NESTING TERRITORY' is a single nest or group of nests with at least one resident adult Ferruginous Hawk during the nesting season.

Author: D.Mikesic, Zoologist
Navajo Natural Heritage Program
Department of Fish and Wildlife
dmikesic@navajofishandwildlife.org

Navajo Nation Department of Fish and Wildlife's

Ferruginous Hawk Management Guidelines for Nest Protection:

1. Protect all nesting Ferruginous Hawks on the Navajo Nation during March 1st to July 31st with the following provisions:
    a. Allow no BRIEF ACTIVITIES within 0.8 km (0.5 mi) of an OCCUPIED NEST.
    b. Allow no LIGHT ACTIVITIES within 1.0 km (5/8 mi) of an OCCUPIED NEST
    c. Allow no HEAVY ACTIVITIES within 1.2 km (3/4 mi) of an OCCUPIED NEST.
    d. Allow no LOUD ACTIVITIES within 1.6 km (1 mi) of an OCCUPIED NEST.
2. Protect all NESTS from human disturbances associated with PERMANENT STRUCTURES on a year-round basis.
    a. Allow no DAILY-USE PERMANENT STRUCTURES within 1.6 km (1 mi) of a known NEST.
    b. Allow no INFREQUENT-USE PERMANENT STRUCTURES within 1.0 km (5/8 mi) of a known NEST.
3. Follow additional measures during project planning if proposed activity is near known Ferruginous Hawk nesting territories or potential habitat to further minimize impacts.
    a. Place new constructions and human disturbances near previously-disturbed areas whenever possible.
    b. Limit the size of construction to smallest area needed to meet project needs.
    c. Reclaim disturbed areas and obliterate roads post-construction.
    d. Consider alternative construction sites and/or methods.

4. Mitigate for unavoidable losses of NESTS or occupied or potential habitat, and for potential disturbances to nesting Ferruginous Hawks with measures approved by the Navajo Nation Department of Fish and Wildlife. Installation of artificial nesting structures is usually recommended for losses of NESTS or habitat, while monitoring of nesting success for up to five (5) years at the affected NEST(S) is usually recommended for disturbances to nesting Hawks.

5. At the discretion of a qualified biologist of the Navajo Nation Department of Fish and Wildlife, these regulations may be revised or altered as new information becomes available; and deviations (esp. in distances and dates) will be allowed on a case-by-case basis and for warranted circumstances, especially for emergency situations.

6. All Ferruginous Hawks NESTS found in the future will be protected under these Protection Measures following verification and documentation by the Navajo Nation Department of Fish and Wildlife.

7. Very old and dilapidated Ferruginous Hawk NESTS may be deleted from these Protection Measures by a qualified biologist of the Navajo Nation Department of Fish and Wildlife Nest if the NEST appears to no longer represent a suitable breeding location for the hawk. Only NESTS known, or suspected, to be unused for at least ten (10) years, composed of unconsolidated sticks with no vertical cohesiveness may be considered for deletion.

8. All NEST locations are to be considered confidential information of The Navajo Nation Department of Fish and Wildlife, and may be divulged only for protection of the NEST and proper land-use planning.

9. Because of BHP Billiton's commitment to monitor raptor nests each year, Ferruginous Hawk NESTS on active sections of Navajo Mine are excluded from these Protection Measures; however, these Measures apply for NESTS occurring on Mine lease-lands after mining operations and land reclamation are completed.