

Biological Survey Report and Biological Assessment and Evaluation for the Jones Hill Exploration Project in Santa Fe and San Miguel Counties, New Mexico

AUGUST 2021

CONFIDENTIAL SENSITIVE DATA
NOT FOR PUBLIC DISTRIBUTION

FEDERALLY LISTED SPECIES ANALYZED:

Holy Ghost Ipomopsis: No Effect

Mexican Spotted Owl: May Affect, but Not Likely to Adversely Affect

Mexican Spotted Owl Critical Habitat: May Affect, but Not Likely to Adversely Affect

USFWS Consultation Code: 02ENNM00-2019-SLI-1128

PREPARED FOR

U.S. Forest Service

ON BEHALF OF

Comexico LLC/New World Resources Limited

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**BIOLOGICAL SURVEY REPORT AND BIOLOGICAL
ASSESSMENT AND EVALUATION FOR THE JONES HILL
EXPLORATION PROJECT IN SANTA FE AND
SAN MIGUEL COUNTIES, NEW MEXICO**

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1 INTRODUCTION

Comexico LLC/New World Resources Limited (Comexico) contracted SWCA Environmental Consultants (SWCA) to complete a biological survey and report for the proposed Jones Hill Exploration Project (Project), located in Santa Fe and San Miguel Counties, New Mexico. The proposed action would consist of a staging area, 32 proposed drill sites (of which the proposed action could be implemented upon only 30), road maintenance, and new overland route roads, for a maximum of 7.72 acres (Appendix A). The proposed project would be on National Forest System land managed by the U.S. Forest Service (USFS), Santa Fe National Forest (SFNF), Pecos–Las Vegas Ranger District, the lead agency for the current undertaking.

This biological survey report (BSR) addresses the potential effects of the proposed action on all fish, wildlife, and plant species listed by the federal government as threatened or endangered, or proposed for listing as threatened or endangered, that are known to occur or with potential to occur within or near the project area. The purpose of this BSR is to assess potential project effects on these species and their habitat and, through consultation with the U.S. Fish and Wildlife Service (USFWS), ensure the proposed action does not jeopardize federally listed species.

In accordance with the Endangered Species Act (ESA) Section 7 and Forest Service Manual 2671.4, the SFNF is required to consult with the USFWS regarding the determination of adverse effects on threatened, endangered, or proposed species. This BSR evaluates the potential effects of the proposed activities on federally threatened or endangered species listed under the ESA, as amended (16 United States Code [USC] 1531–1541 et seq.); USFS sensitive and management indicator species; state threatened or endangered species listed under the New Mexico Wildlife Conservation Act (17-2-41 New Mexico Statutes Annotated [NMSA] 1978); and the State’s endangered plant species regulations (75-6-1 NMSA 1978).

The findings of this BSR are based on the best data and scientific information available at the time of preparation. If new information reveals effects that may impact these species or their habitats in a manner or to an extent not considered in this evaluation; or if a new species is listed or habitat is identified that may be affected by the action, this BSR would be revised or amended and additional consultation could be required prior to project implementation.

2 PROJECT LOCATION AND PROPOSED ACTION

Comexico submitted an Exploration Permit Application to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (EMNRD) and a Plan of Operations to the U.S. Department of Agriculture, SFNF on June 3 and 5, 2019, respectively and subsequently amended from time to time in response to review comments. The following provides a description of the planned activities associated with the proposed exploratory drilling. Please refer to the project environmental assessment for the specific Proposed Action.

The proposed activities include up to 30 boreholes via diamond drilling and/or reverse circulation drilling to determine the possible extent of a mineral deposit containing copper, gold, zinc, lead, and silver. The project activities are within the north half of Section 1, Township 17 North, Range 11 East (see Appendix A). The proposed disturbance would be limited to areas of existing roads and/or former disturbance. The approximate area proposed to station a drill rig, mud pits, and associated drilling materials and equipment upon a borehole location is 60 × 40 feet and is referred to as the drill site, of which there are a maximum of 30 are proposed. The staging area is approximately 100 × 100 feet (0.23 acre). All proposed surface-disturbing activities are intentionally sited to be co-located where existing roads, historic roads,

or historic drill sites have disturbed the soil as a result of previous drilling activities. Minor overland routes on historic tracks and minor earth grading at drill rig stations is proposed at a small number of locations.

The project area for drilling activities is proposed to disturb up to approximately 7.72 acres, which includes the drill site locations, staging area, overland route road disturbance, and 1.2 miles of road maintenance of existing Maintenance Level 2 Forest Service roads proposed by Comexico to mitigate existing and future erosive conditions. The 1.2 miles of road is within an access corridor consisting of approximately 3 miles of existing road which, at a width of 15 feet, is considered in its entirety to be part of the total disturbance for the project. For the purposes of the proposed action, the Analysis Area is considered the project area for drilling activities.

Drilling operations are proposed to begin as soon as all required authorizations are granted, in compliance with seasonal restrictions, and be completed within 3 calendar years of project implementation. A Limited Operating Period (LOP) would be in effect from March 1 through August 31. The LOP would be implemented to protect Mexican spotted owl (*Strix occidentalis lucida*; MSO) habitat within 0.5 mile of the project area. This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS. Resource Protection Measures (RPMs) that avoid or minimize environmental harm are included in the project Best Management Practices (BMPs) specific to botany, cultural resources, recreation, silviculture, fuels, watershed, wildlife, soils, transportation, and air quality (see Appendix B for the RPMs). The extent of disturbance from drilling noise would be lessened with Comexico's noise-dampening efforts, such as the use of panels to baffle noise from drilling machinery. Equipment being used for the project has been recorded as producing noise levels of less than 60 A-weighted decibels (dBA) within 50 meters, below the 69 dBA threshold for owls to flush (personal communication, Patrick Siglin, via email with Matt McMillan, SWCA, November 20, 2020; USFWS 2012a). Additionally, no nesting trees, alive or dead, of sufficient size, age, or species, for the MSO would be cut down for this project. However, some coniferous trees with a diameter at breast height (dbh) of less than 6 inches may be cut or trimmed at the drill site locations and proposed overland access routes to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. It is expected that less than 3% of these trees to be removed are over 5 inches dbh, and no trees would be removed that are over 6 inches dbh. Trees proposed to be removed may include species such as ponderosa pine (*Pinus ponderosa*), Engelmann spruce (*Picea engelmannii*), Gambel oak (*Quercus gambelii*), and common juniper (*Juniperus communis*). Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to drilling as part of the drill site prep. See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action.

Equipment proposed includes pickup trucks, a trailer or cargo truck, a track-mounted excavator, a skid steer loader or equivalent, a water truck, a flatbed truck, a core drilling rig, a reverse circulation rig, an all-terrain vehicle/utility task vehicle, two 3,000-gallon water tanks, a water pump, a bean pump, a light tower/generator, mud pits, portable toilets, and a portable toilet service truck. Drilling would use water from the on-site well. The upper 5 to 20 feet of each hole would be cased with temporary surface casing. Drilling fluids would be used to facilitate cuttings removal, reduce friction on the bit, cool the drilling bit, reduce or prevent groundwater inflow, reduce or prevent fluid outflow to the environment, and provide for a stable borehole. A specific goal of using the drilling fluid is to create a filter cake in the borehole that would prevent loss of drilling fluid to the environment. Drilling fluid would be a mixture of fresh water and various additives. Comexico proposes to use common additives including bentonite, drilling foam (used as a surfactant to plug or seal zones with lost circulation), or polymers (used to stabilize the

borehole). Drilling fluid preparation is conducted in a containment tank. All boreholes would be plugged and abandoned in compliance with the New Mexico Office of the State Engineer (OSE) regulations. All disturbed surface areas would be managed and reclaimed as required under any permits according to the RPMs and BMPs outlined in Appendix B as well as the Hydrogeologic Report (SWCA 2020).

2.1 Planned Activities for Drilling Sites

Drilling locations have been proposed for 32 potential drill sites with each having dimensions of 60 × 40 feet. These general dimensions would support positioning of a drill rig, a nighttime operating light, a mud pump, 2 mud pits, drill pipe, and erosion control features. The proposed action may be implemented on up to 30 of the 32 proposed drill site locations.

Comexico would employ drill rigs built on rubber tracks or tires, which are highly maneuverable on rough terrain and anticipated to perform well on existing roads. The rubber tracks disperse the mass load of the machinery across a large surface area, and the rigs' slow maximum speed ensures there is no road damage. These rigs also come equipped with outriggers to help level the rig at the drill site, thereby minimizing ground leveling required. If any proposed drill site surface grading or minor excavation occurs, the topsoil would be stockpiled and segregated, enclosed behind a barrier, and covered to protect from potential water runoff erosion. Upon finalizing the use of any drill site, any change to the surface would be reclaimed by regrading back to its original contours and cross-drain features would be constructed. Downslope features such as manufactured biodegradable wattles, slash, or logs would be placed on any outsloped portions of roads or drill sites, and installed to prevent sediment from reaching surface drainages after operations.

The average borehole depth proposed for this drill program is about 1,600 feet. The average borehole would require about 8.5 days to complete, using a single rig with a two-shift operation (22 hours per day), from setup to hole completion and plugging.

Comexico has proposed to construct two mud pits within the 60 × 40-foot drill site to allow for drill mud circulation. Any existing topsoil would be removed, segregated, and stockpiled. The mud pits would have maximum dimensions of 5 × 10 × 5 feet, lined with 6-mil-thick plastic, bounded and covered with fencing and netting, and designed with a ramp for egress in the event an animal or human enters the pit. At the end of the proposed activity, mud pits would be filled and recontoured.

Once exploration drilling activities have been completed at a drill site the drill site would be reclaimed with the mud pits backfilled, removed topsoil would be replaced, an approved seed mix would be planted, crest-only waterbars would be maintained, and, if an overland route, the access would be blocked using a non-drivable waterbar.

All mechanized operations, from road maintenance, drilling, and reclamation, would be completed less than 36 months from implementation.

2.2 Access

Access to the project area is via USFS Forest Road 192 (Indian Creek) using a private easement through five parcels of land, and then via Forest Road 192, as authorized by the USFS. In addition to Forest Road 192, other National Forest System roads that may be used include Forest Roads 120, 120K, 120KA, 120KB, 120KBA, 120KC, 120KD, 120KDA, and 120KE. Total road use proposed by Comexico to undertake exploration drilling operations is as follows:

- Indian Creek private easement: 0.7 mile

- Existing Forest Service Road: 5.3 miles
- Overland routes, upon decommissioned road prisms and pioneer routes: 0.2 mile

The proposed Comexico exploratory drilling operation would require the following traffic:

- Daily access via pickup truck, estimated as one truck per drill crew per shift and one truck per day for a project geologist.
- A water truck is proposed to deliver water to the operating drill rig using the on-site well, which is located an average of approximately 0.5 mile from any given proposed drill location. The water truck will also be used to control fugitive dust as necessary when dusty conditions occur.
- Additional periodic access is required for initial drill rig mobilization and setup, the skid-steer/forklift, earth-moving equipment, portable toilet delivery and regular cleanout, drill crew foreman twice per week via pickup truck, and occasional visits by project managers and agencies.

2.3 Road Improvements

The National Forest System roads at the project area would support these activities with minimal earth work required. These roads are each listed as Maintenance Level 2 as described in the SFNF Travel Analysis Report and supporting documentation (USFS 2008a). Maintenance Level 2 roads are described as follows (USFS 2008b: page 12-13):

Level 2 roads are suitable only for high clearance vehicles. Most of these roads are open to the public; anyone can drive on them, but they are not suitable for passenger cars.

There are some Maintenance Level 2 administrative use roads that are not open to the public but available for Forest Service use or for use by people who hold Forest Service special use permits or road-use permits. Level 2 roads are used for many activities including mineral extraction, camping, hunting, and by people out for a drive. Generally, we do not maintain these roads or we maintain them to minimum standards. Many are rutted and eroded and are difficult to drive, even in a high clearance vehicle. Some roads that were built for passenger cars have deteriorated, because of lack of maintenance, into roads that are suitable only for high-clearance vehicles.

The activities Comexico proposes could increase the Average Daily Traffic (ADT) by as much as five vehicles per day in the primary access portions of the road network and by as much as 10 on select roads within the proposed drill area. In general, Level 2 roads are low-volume roads defined as having ADT less than 400. The traffic increase due to the Comexico project is consistent with current road maintenance levels.

In a site visit conducted on August 1, 2019, USFS personnel identified access roads Forest Roads 192 and 120 as having areas requiring maintenance and suggested that Comexico propose a maintenance plan prior to drilling operations. Comexico has submitted a maintenance plan to address those portions of the roads that have been identified as requiring maintenance. Best management practices (BMPs) and RPMs would be included in the maintenance plan in order to reduce erosion and sedimentation associated with road use.

3 SURVEY METHODOLOGY

3.1 Biological Survey

SWCA biologist Nathan Petersen conducted a pedestrian biological survey of each drill site location, staging area, and access routes on July 15, 2019. Prior to the survey, SWCA reviewed baseline data for the project area, which is defined below, including U.S. Geological Survey (USGS) topographic maps, Natural Resources Conservation Service (NRCS) soil maps (NRCS 2019a), New Mexico Crucial Habitat Assessment Tool data (New Mexico Crucial Habitat Data Set 2013), National Hydrography Dataset (NHD) geographic information system (GIS) maps (USGS 2013), National Wetlands Inventory (NWI) maps (USFWS 2019a), USFWS Information for Planning and Consultation (IPaC) system data (USFWS 2019b), the USFWS Critical Habitat Portal (USFWS 2019c), USFS SFNF Management Indicator Species (MIS) and Regional Foresters Sensitive Species (RFSS) (USFS 2013), New Mexico Department of Game and Fish (NMDGF) Biota Information System of New Mexico (BISON-M) data (BISON-M 2019), the New Mexico Rare Plants website (New Mexico Rare Plant Technical Council 1999), and the EMNRD state endangered plant species list (EMNRD 2019).

During the biological survey, maps and shapefiles provided by Comexico were used for general orientation, to locate the proposed project boundaries, and to create maps of the proposed project area (see Appendix A). The SWCA survey consisted of the staging area, 32 proposed drill sites, and all access routes including the new limited overland route road disturbance, each with a 50-foot buffer, for a total of 17.01 acres. This area was surveyed to assess habitat suitability for USFWS, state, and USFS special-status plant and wildlife species.

3.2 Species Specific Surveys

In addition to the biological survey of the project area, SWCA conducted protocol surveys for MSO and northern goshawk (*Accipiter gentilis atricapillus*; NOGO), within the project area and in other areas of interest to Comexico in the vicinity of Jones Hill. MSO surveys followed the 2012 USFWS MSO survey protocols and SWCA's survey design incorporated discussions with the USFWS and the SFNF Pecos–Las Vegas Ranger District Biologist (USFWS 2012b). USFS protocols were followed for survey design and survey methodology for the NOGO surveys (Woodbridge and Hargis 2006). SWCA also conducted a survey in the project area for rare plant species, including the Holy Ghost ipomopsis (*Ipomopsis sancti-spiritus*; HGI). Survey methods for rare plants and HGI included intensive pedestrian surveys within each drill site location and the staging area, as well as the access roads in the project area. The dates and results of these surveys are listed in Section 4 below.

3.3 Special Aquatic Sites

As part of the biological survey, the proposed project area was also reviewed for the presence of special aquatic sites and other waters. Wetlands are the most common type of special aquatic site and are defined by the U.S. Army Corps of Engineers (USACE) as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987:9). According to the USACE (1987), in order for an area to be considered a wetland, it must contain the following three parameters under normal circumstances: 1) the presence of wetland hydrology showing regular inundation, 2) a predominance of hydrophytic (water-loving) vegetation, and 3) soils characteristic of frequent saturation (i.e., hydric soils). The presence or absence of a wetland was identified in the field using routine on-site delineation methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers*

Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010).

The presence/absence of special aquatic sites other than wetlands (sanctuaries, refuges, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes) was determined by visual observation during the biological survey of the proposed project area.

3.4 Other Waters

The presence/absence of lotic systems (e.g., creeks, rivers, arroyos, human-made ditches; collectively “streams”) was identified in the field using the methods outlined in *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (USACE 2014). An ordinary high-water mark (OHWM) is a line on a shore or bank established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. The OHWM is a defining element for identifying the lateral limits of non-wetland waters. Federal jurisdiction over a non-wetland water of the U.S. typically extends to the OHWM.

4 SURVEY RESULTS

4.1 General Characteristics

The elevation of the proposed project area ranges from approximately 8,800 (at the staging area) to 9,400 (at the highest drill site) feet above mean sea level (amsl), while access routes on National Forest System land ranges lower to approximately 7,680 feet amsl. The climate for this area, based on the climatic records for the weather station data located in Pecos, New Mexico (COOP Station No. 296676), has an average annual maximum temperature of 65.8 degrees Fahrenheit (°F), with an average annual minimum temperature of 32.9°F. The average annual precipitation is 16.15 inches, with the majority occurring between May and October, while the average annual total snowfall is 27.2 inches, which largely occurs between November and April (Western Regional Climate Center 2016). Weather during the biological survey ranged from approximately 58°F to 74°F, and was slightly cloudy, with winds approximately 2 to 5 miles per hour. Representative photographs of the proposed project area are included in Appendix D.

4.2 Soils

According to the NRCS (2019a), five soil types are mapped within the proposed project area (Table 4.1). These soil units are considered well drained, with none of the soil units being classified as hydric.

Table 4.1. Soils in the Proposed Project Area

Soil Type Name	Soil Map Unit Symbol	Acres in Project Area	Percent of Project Area
Derecho family, 15 to 40 percent slopes	213	1.35	17.76%
Etown, moderately deep-Derecho Families-Rock outcrop association, 15 to 120 percent slopes	228	3.56	44.21%
Kadygulch family, 15 to 40 percent slopes	351	0.08	1.05%

Soil Type Name	Soil Map Unit Symbol	Acres in Project Area	Percent of Project Area
Broadmoor family-Rock outcrop complex, 25 to 120 percent slopes, extremely stony	353	2.29	30.13%
Hesperus-Dula, frequently flooded-Pastorius complex, 0 to 15 percent slopes	HeC	0.52	6.84%
Total		7.8	100%

Source: NRCS (2019a).

4.3 Vegetation

The proposed project area is located within two biotic communities: Petran Montane Conifer Forest and Petran Subalpine Conifer Forest (Brown et al. 2007). The Indian Creek subwatershed contains a mixture of conifer species with stands of ponderosa pine found on south-facing slopes. Vegetation in the Dry Gulch subwatershed consists of ponderosa pine, quaking aspen (*Populus tremuloides*), and mixed conifer (Upper Pecos Watershed Association [UPWA] 2012). During the biological survey, biologists identified these general vegetation community types within the proposed project area. At the time of the biological survey, the vegetation community within and/or surrounding the proposed project area had previous disturbance from mining, logging, and livestock grazing activities, as well as recreational use such as hunting, off-road vehicles, and camping. Plant species detected by SWCA biologists are listed in Table 4.2. Photographs of the vegetation communities within and surrounding the proposed project area are provided in Appendix D.

Table 4.2. Plant Species Observed during the Biological Survey

Scientific Name	Common Name
<i>Abies concolor</i>	White fir
<i>Acer glabrum</i>	Rocky mountain maple
<i>Achillea millefolium</i>	Common yarrow
<i>Androsace septentrionalis</i>	Pygmyflower rockjasmine
<i>Antennaria parvifolia</i>	Small-leaf pussytoes
<i>Aquilegia elegantula</i>	Western red columbine
<i>Berberis repens</i>	Creeping barberry
<i>Bistorta bistortoides</i>	American bistort
<i>Bromus porteri</i>	Porter brome
<i>Calylophus lavandulifolius</i>	Lavenderleaf sundrops
<i>Campanula rotundifolia</i>	Bluebell bellflower
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Carex microptera</i>	Smallwing sedge
<i>Carex occidentalis</i>	Western sedge
<i>Castilleja linariifolia</i>	Wyoming Indian paintbrush
<i>Ceanothus fendleri</i>	Fendler's ceanothus
<i>Clematis occidentalis</i>	Western blue virginsbower
<i>Descurainia incisa</i>	Mountain tansymustard
<i>Elymus trachycaulus</i>	Slender wheatgrass

Scientific Name	Common Name
<i>Erigeron coulteri</i>	Large mountain fleabane
<i>Erigeron speciosus</i>	Aspen fleabane
<i>Erigeron subtrinervis</i>	Threenerve fleabane
<i>Erodium cicutarium</i>	Redstem stork's bill
<i>Fallugia paradoxa</i>	Apache plume
<i>Festuca ovina</i>	Sheep fescue
<i>Fragaria vesca</i>	Woodland strawberry
<i>Geranium caespitosum</i>	Pineywoods geranium
<i>Holodiscus discolor</i>	Oceanspray
<i>Hymenopappus newberryi</i>	Newberry's hymenopappus
<i>Hymenoxys hoopesii</i>	Owl's-claws
<i>Iris missouriensis</i>	Rocky Mountain iris
<i>Ipomopsis aggregata</i>	Scarlet gilia
<i>Jamesia americana</i>	Fivepetal cliffbush
<i>Juniperus communis</i>	Common juniper
<i>Juniperus scopulorum</i>	Rocky Mountain juniper
<i>Lepidium densiflorum</i>	Common pepperweed
<i>Melica porteri</i>	Porter's melicgrass
<i>Melilotus officinalis</i>	Sweetclover
<i>Mertensia lanceolata</i>	Prairie bluebells
<i>Packera fendleri</i>	Fendler's ragwort
<i>Penstemon barbatus</i>	Beardlip penstemon
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Pinus strobiformis</i>	Southwestern white pine
<i>Poa fendleriana</i>	Muttongrass
<i>Populus tremuloides</i>	Quaking aspen
<i>Potentilla hippiana</i>	Wooly cinquefoil
<i>Pseudotsuga menziesii</i>	Douglas-fir
<i>Psilostrophe villosa</i>	Wooly paperflower
<i>Pteridium aquilinum</i>	Western brackenfern
<i>Quercus gambelii</i>	Gambel oak
<i>Ribes cereum</i>	Wax currant
<i>Rudbeckia laciniata</i>	Cutleaf coneflower
<i>Salix monticola</i>	Park willow
<i>Schedonorus pratensis</i>	Meadow fescue
<i>Senecio wootonii</i>	Wooton's ragwort
<i>Symphoricarpos oreophilus</i>	Mountain snowberry
<i>Symphyotrichum ascendens</i>	Western aster
<i>Taraxacum erythrospermum</i>	Red-seeded dandelion
<i>Thermopsis montana</i>	Mountain goldenbanner

Scientific Name	Common Name
<i>Trifolium repens</i>	White clover
<i>Typha latifolia</i>	Broadleaf cattail
<i>Verbascum thapsus</i>	Common mullein
<i>Verbena macdougalii</i>	MacDougal verbena
<i>Viola adunca</i>	Hookedspur violet
<i>Viola canadensis</i>	Canadian white violet

Note: Nomenclature follows the PLANTS Database (NRCS 2019b).

4.4 Non-Native Plants and Noxious Weeds

During the biological surveys, no State of New Mexico–listed noxious weeds (New Mexico Department of Agriculture 2016) were observed. Scotch thistle (*Onopordum acanthium*) and bull thistle (*Cirsium vulgare*) were observed along Indian Creek Road (Forest Road 192) leading up to the proposed project area, but were not observed within the proposed project area. Siberian elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*), both State of New Mexico–listed noxious weeds, occur in the project area and along access roads in the project area. Other non-native species that are invasive, such as common mullein (*Verbascum thapsus*) and redstem stork’s bill (*Erodium cicutarium*), do occur in the project area, but are not listed as a noxious weed by the NMDA or the USDA. No USDA-listed noxious weeds were identified within the proposed project area (USDA 2016).

4.5 Special Aquatic Sites and Other Waters

The proposed project area crosses two sub-watershed boundaries: Dry Gulch-Pecos River (Hydrologic Unit Code [HUC]130600010205) in the western portion of the project area (approximately 14.59 acres) and Indian Creek-Pecos River (130600010204) (NRCS 2019c; UPWA 2012) in the eastern portion of the project area (approximately 7.62 acres). Two ephemeral drainages occur within the proposed project area and cross near drill sites in the northwest and the staging area in the southeast. Four other ephemeral drainages occur within the Analysis Area, including two drainages just outside the project area to the north and northwest (NRCS 2019c).

4.5.1 Special Aquatic Sites

According to NWI data (USFWS 2019a), there are two riverine wetland features (R4SBC) within the proposed project area. Each of these sites are classified by NWI as intermittent riverine streambed that is seasonally flooded (R4SBC). These sites are associated with the ephemeral drainages crossing near the drill sites and staging area (see Appendix D for photographs of each drainage). Four other wetland features (R4SBC) occur within the Analysis Area. During the biological survey, SWCA located the two wetland features within the project area to determine their wetland status (see Figure A.2 in Appendix A for observation point locations). Both sites were determined to not meet wetlands classification due to the lack of sufficient facultative and obligate hydrophytic vegetation (USACE 2010). Data forms for the observation points are in Appendix E. The project area is highly disturbed by historic mining and exploration operations.

Observation Points #1 and #2 are within the drill site in the northwestern-most part of the project area and are associated with groundwater seeping out of two old mine adits. Groundwater from one mine adit leads to the ephemeral drainage that flows southwest of the project area, whereas groundwater from the other mine adit seeps into a small pond (approximately 10 × 15 feet) and is impounded as the result of human

alteration (see Photograph D.9 in Appendix D). An area in front of the mine adit is seasonally wet from groundwater from the mine adit. Groundwater from both mine adits could be emanating from the same spring or seep within the mine adit.

Observation Point #3 is just southeast of the staging area and is a result of surface water that is detained by a stock pond and then flows down an ephemeral stream during storm events. During the biological survey, the stock tank had a few inches of water present, but it was observed to be dry during some of the protocol surveys as well as site visits by the client. The NHD line flows through the stock pond and the staging area. This ephemeral drainage has also been observed to be dry during site visits and wet at other times. During the biological survey, the drainage was not currently running, but it had been during protocol surveys. Although this site had positive indicators for wetland soils and hydrology, there was not sufficient facultative and obligate hydrophytic vegetation present, and the site does not meet the criteria of a wetland (USACE 2010). There is also a plastic trough holding water adjacent to the dirt tank.

4.5.2 Other Waters

Based on review of the NHD (USGS 2013), two potentially jurisdictional water features intersect the proposed project area crossing near the drill sites and staging area (see Figure A.2 in Appendix A for stream locations). During the biological survey, the field biologists confirmed the two water features; however, only the stream associated with the groundwater from the old mine adit (northwestern-most part of the project area) had a discernable OHWM, which is approximately 6 inches wide by 3 inches deep. The bank-to-bank width of the stream is approximately 1 foot, and the substrate is rocky.

4.6 Wildlife

The Crystalline Mid-Elevation Forest and Sedimentary Mid-Elevation Forest ecoregions (Griffith et al. 2006) provide habitat for a variety of wildlife species. SWCA biologists detected 20 bird species and three mammal species during the biological survey of the proposed project area (Table 4.3). However, SWCA biologists observed more wildlife during species specific surveys for MSO, NOGO, and HGI. These observations are noted in Table 4.3 with an asterisk. USFS records of species occurrences within the Analysis Area include the MSO, great horned owl (*Bubo virginianus*), and flammulated owl (*Psiloscoops flammeolus*). Just outside of the Analysis Area, the USFS has recorded northern leopard frog (*Lithobates pipiens*), Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*), saw-whet owl (*Aegolius acadicus*), red squirrel (*Sciurus vulgaris*), and fence lizard (*Sceloporus undulatus*).

Table 4.3. Wildlife Detected during the Biological Survey of the Proposed Project Area

Scientific Name	Common Name
Birds	
<i>Accipiter cooperii</i>	Cooper's hawk*
<i>Accipiter striatus</i>	Sharp-shinned hawk*
<i>Aegolius acadicus</i>	Northern saw-whet owl*
<i>Buteo jamaicensis</i>	Red-tailed hawk*
<i>Cathartes aura</i>	Turkey vulture*
<i>Catharus guttatus</i>	Hermit thrush
<i>Certhia americana</i>	Brown creeper*
<i>Cinclus mexicanus</i>	American dipper*
<i>Colaptes auratus</i>	Northern flicker

Scientific Name	Common Name
<i>Contopus sordidulus</i>	Western wood pewee*
<i>Corvus corax</i>	Common raven
<i>Cyanocitta stelleri</i>	Steller's jay
<i>Cynanthus latirostris</i>	Broad-billed hummingbird
<i>Dendragapus obscurus</i>	Dusky grouse*
<i>Empidonax hammondi</i>	Hammond's flycatcher*
<i>Empidonax occidentalis</i>	Cordilleran flycatcher
<i>Glaucidium californicum</i>	Northern pygmy owl*
<i>Junco hyemalis</i>	Dark-eyed junco
<i>Loxia curvirostra</i>	Red crossbill
<i>Myadestes townsendi</i>	Townsend's solitaire*
<i>Patagioenas fasciata</i>	Band-tailed pigeon*
<i>Piranga ludoviciana</i>	Western tanager
<i>Poecile gambeli</i>	Mountain chickadee
<i>Psiloscops flammeolus</i>	Flammulated owl*
<i>Regulus calendula</i>	Ruby-crowned kinglet
<i>Selasphorus platycercus</i>	Broad-tailed hummingbird*
<i>Selasphorus rufus</i>	Rufous hummingbird*
<i>Setophaga coronata</i>	Yellow-rumped warbler
<i>Setophaga graciae</i>	Grace's warbler*
<i>Sitta canadensis</i>	Red-breasted nuthatch*
<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Sitta pygmaea</i>	Pygmy nuthatch
<i>Sphyrapicus nuchalis</i>	Red-naped sapsucker*
<i>Sphyrapicus thyroideus</i>	Williamson's sapsucker
<i>Spinus pinus</i>	Pine siskin
<i>Spizella passerina</i>	Chipping sparrow
<i>Strix occidentalis lucida</i>	Mexican spotted owl*
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Turdus migratorius</i>	American robin
<i>Vermivora celata</i>	Orange-crowned warbler*
<i>Vireo gilvus</i>	Warbling vireo
Amphibians and Reptiles	
<i>Lithobates pipiens</i>	Northern leopard frog* (audible)
<i>Phrynosoma hernandesi</i>	New Mexico short-horned lizard*
<i>Thamnophis proximus</i>	Western ribbonsnake*
Mammals	
<i>Callospermophilus lateralis</i>	Golden-mantled ground squirrel
<i>Cervus elaphus nelsoni</i>	Rocky Mountain elk
<i>Odocoileus hemionus</i>	Mule deer

Scientific Name	Common Name
<i>Puma concolor</i>	Mountain lion* (scat)
<i>Sciurus aberti</i>	Abert's squirrel*
<i>Sylvilagus</i> spp.	Cottontail rabbit*
<i>Tamiasciurus hudsonicus</i>	Red squirrel*
<i>Neotamias</i> spp.	Chipmunk*
<i>Ursus americanus</i>	Black bear* (visual and scat)

* Observations made during MSO, NOGO, and HGI protocol surveys

4.6.1 **Migratory Bird Treaty Act**

Most bird species are protected by the Migratory Bird Treaty Act (MBTA). The MBTA implements various treaties and conventions between the United States and other countries for the protection of migratory birds. Under the MBTA, unless permitted by regulations, it is unlawful to 1) pursue, hunt, take, capture, or kill; 2) attempt to take, capture, or kill; and 3) possess, offer to sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. USFWS regulations broadly define “take” under the MBTA to mean “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” Under the MBTA, “take” does not include habitat loss or alteration.

Suitable nesting habitat for migratory birds is present throughout the proposed project area. During SWCA’s biological survey and protocol surveys, 41 bird species were observed or identified by call (see Table 4.3) in the proposed project area. No trees of sufficient size, age, or species, for MSO nesting, alive or dead, would be cut down for this project. However, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill site locations to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel’s oak will stump out. It is expected that less than 3% of these trees to be removed are over 5 inches dbh, and no trees would be removed that are over 6 inches dbh. As part of the proposed action, tree removal work activities would occur prior to implementation. See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. Project activities are planned to occur outside of the MBTA season and therefore would not impact nesting or breeding activity. If future activities require vegetation removal during the breeding season (March–August), a pre-construction nesting survey would be required up to 2 weeks prior to vegetation removal to identify and establish the occupancy status of the potentially suitable nests detected within the proposed project area.

4.6.2 **Bald and Golden Eagle Protection Act**

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the MBTA and the Bald and Golden Eagle Protection Act. Bald eagles are found typically in association with water, and they nest and breed from October to July throughout the state of New Mexico. Golden eagles nest primarily on rock ledges or cliffs and occasionally in large trees at elevations ranging from 4,000 to 10,000 feet amsl. Golden eagles are typically found in mountainous regions of open country, prairies, arctic and alpine tundra, open wooded areas, and barren areas. Both bald and golden eagles are carnivores. Bald eagles prey on fish but also on mammals, especially prairie dogs (*Cynomys* sp.).

Golden eagles feed mainly on small mammals, as well as invertebrates, carrion, and other wildlife (BISON-M 2019; Stahlecker and Walker 2010).

No bald or golden eagles were observed during the biological survey. Bald and golden eagles are unlikely to inhabit the proposed project area due to the lack of nesting habitat and large streams or bodies of water. Prairie dog colonies are also lacking within or adjacent to the proposed project area. However, the vegetation communities within the proposed project area could provide suitable foraging habitat and therefore incidental occurrences are possible. The proposed project is not anticipated to cause take of individual bald or golden eagles, their nests, or eggs.

4.7 Species Specific Surveys

SWCA conducted species specific surveys for MSO, NOGO, and HGI in the project area and vicinity of Jones Hill. The dates and results of these surveys are listed in Table 4.4 through Table 4.5 below.

Table 4.4. 2019 Species Specific Survey Dates and Results

Date	Survey Type	Result	Personnel
6/3–6/5	MSO	2 separate male MSOs.	I. Dolly, N. Petersen
6/25–6/27	MSO	2 adult male MSOs detected.	I. Dolly, E. Dolly
7/22–8/9	NOGO Intensive Search	No NOGO detected.	J. Shuck, M. Nordgren, and other SWCA avian biologists
7/26–7/29	MSO and NOGO Surveys	2 male MSO detections. No NOGO detected.	I. Dolly, E. Dolly
8/7–8/9	MSO and NOGO Surveys	No MSO's detected. No NOGO detected.	I. Dolly, E. Dolly
8/30	Rare Plant Survey	No rare plants or HGI were observed.	I. Dolly, N. Petersen

Table 4.5. 2020 Species Specific Survey Dates and Results

Date	Survey Type	Result	Personnel
6/9–6/12	MSO	3 male MSO detected 6/9-6/10.	I. Dolly, N. Petersen
6/24–6/26	MSO	1 male MSO detected 6/24.	I. Dolly, N. Petersen
7/15–7/17	MSO	1 male MSOs detected 7/16.	I. Dolly, N. Petersen
8/11-8/12	MSO	No MSOs detected.	I. Dolly, N. Petersen

Table 4.6. 2021 Species Specific Survey Dates and Results

Date	Survey Type	Result	Personnel
5/11–5/12	MSO	No MSOs detected.	I. Dolly, N. Petersen
6/3–6/4	MSO	1 male MSO detected at 2 locations on 6/3.	I. Dolly, N. Petersen
7/8–7/9	MSO	No MSOs detected.	I. Dolly, N. Petersen
8/5-8/5	MSO	No MSOs detected.	N. Petersen, E. Dolly

4.8 Federal and State-Listed Special-Status Species

The special-status species evaluated in this BSR consist of 1) federally protected (endangered and threatened) species (USFWS 2019b), 2) additional species listed by the USFWS as candidate and proposed species (USFWS 2019b), 3) USFS SFNF MIS and RFSS (USFS 2019), and 4) New Mexico state-listed endangered and threatened species (BISON-M 2019; EMNRD 2019). Official lists of federal and state-listed special-status species are in Appendix F. Table 4.7 and Table 4.8 describe the federal and state-listed special-status species with the potential to occur in Santa Fe and San Miguel Counties, New Mexico, their habitat, and potential occurrence in the proposed project area. The potential for occurrence of a species was identified using the following categories:

- *Known to occur*—the species was documented in the proposed project area either during or prior to the biological survey by a reliable observer.
- *May occur*—the proposed project area is within the species' currently known range, and vegetation communities, soils, water quality conditions, etc., resemble those known to be used by the species.
- *Unlikely to occur*—the proposed project area is within the species' currently known range, but vegetation communities, soils, water quality conditions, etc., do not resemble those known to be used by the species, or the proposed project area is clearly outside the species' currently known range.

The USFWS lists four federally threatened or endangered species with the potential to occur in the project area (see Table 4.7; see Appendix F). This includes one threatened species, the MSO; and three endangered species, the HGI, southwestern willow flycatcher (*Empidonax traillii extimus*), and New Mexico meadow jumping mouse (*Zapus hudsonius luteus*). There is no designated critical habitat for the HGI; however, the other three species all have designated critical habitat. Critical habitat for only the MSO occurs in the project area. Based on current distribution and habitat requirements, HGI is unlikely to occur in the project area. However, MSO does occur in the project area. These species are further described in Section 5. Surveys for HGI conducted during the flowering season in 2019 did not indicate presence in the project area. Protocol surveys for the MSO conducted during 2019 confirmed the presence of the species in the project area. Additional MSO surveys are ongoing.

Additionally, eight USFS SFNF MIS and 25 RFSS are known to occur within the SFNF (see Table 4.7 and Table 4.8). These species are further described in Sections 5.2 and 5.3. Neo-tropical migratory birds and bald and golden eagles are described in Section 5.4. Twenty-four state-listed special-status wildlife species and five endangered plant species have the potential to occur within Santa Fe and San Miguel Counties and are listed in Table 4.7 and Table 4.8. State-listed species with the potential to occur in the project area are further described in Section 5.2 and 5.3.

Table 4.7. USFWS Federally Listed Species in Santa Fe and San Miguel Counties, New Mexico

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Holy Ghost ipomopsis (<i>Ipomopsis sancti-spiritus</i>)	USFWS E State SE	Holy Ghost ipomopsis (HGI) grows on relatively dry, steep, west- to southwest-facing slopes on Tererro Limestone substrates in Holy Ghost Canyon from 7,730 to 8,220 feet in elevation. HGI usually grows in open areas relatively free of dense grass cover within Rocky Mountain montane conifer forest communities with species such as ponderosa pine (<i>Pinus ponderosa</i>), Douglas-fir (<i>Pseudotsuga menziesii</i>), aspen, Gambel oak (<i>Quercus gambelii</i>), and mountain mahogany (<i>Cercocarpus montanus</i>). HGI appears to grow best in bare mineral soils with its highest densities on disturbed sites such as road cuts. The upper Pecos River watershed is the only known location where the species grows natively. Experimental populations have been introduced to canyons immediately north and south of Holy Ghost Canyon (Indian Creek, Winsor Creek, and Panchuela Creek), but have had, so far, mixed results in terms of survival. No other populations of this species are known at this time.	May occur. Although the elevation of the project area is outside the known elevation of the species by only a few hundred feet, potentially suitable habitats exist in the project area and the access routes extend into the elevational range. Access to the project area along USFS Forest Road 192 (Indian Creek) passes within about 250 m of the enclosure where HGI experimental populations have been introduced.	See Section 5.1.1.
Southwestern willow flycatcher (<i>Empidonax traillii eximius</i>)	USFWS E State SE	This species breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands including lakes and reservoirs. Historically, the southwestern willow flycatcher nested in native vegetation including willows (<i>Salix</i> sp.), seepwillow (<i>Baccharis salicifolia</i>), boxelder (<i>Acer negundo</i>), buttonbush (<i>Cephalanthus occidentalis</i>), and cottonwood (<i>Populus</i> sp.). Following modern changes to riparian communities, this subspecies still nests in native vegetation but also uses thickets dominated by non-native tamarisk (<i>Tamarix</i> sp.) and Russian olive (<i>Elaeagnus angustifolia</i>) or mixed native non-native stands. There is no critical habitat present in the SFNF. This species is not present in the SFNF and not likely to become established (USFS 2016).	Unlikely to occur. Dense riparian tree and shrub community habitats required for this species do not occur in the project area or vicinity.	No effect. No further analysis.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	USFWS T USFS MIS	The owl inhabits canyon and mixed conifer forest habitats between 8,000 and 9,400 feet, ranging from southern Utah and Colorado, through Arizona, New Mexico, and west Texas, to the mountains of central Mexico. They require mature, old-growth forests of pine (<i>Pinus</i> spp.), Douglas-fir, and ponderosa pine. They are also found in habitats with steep slopes and canyons with rocky cliffs.	Species is known to occur and has critical habitat in the project area.	See Section 5.1.2.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)	USFWS E USFS MIS State SE	This species is endemic to New Mexico, southern Colorado, and Arizona. In New Mexico, this species occurs in the San Juan, Sangre de Cristo, Jemez, and Sacramento Mountains, and in the Rio Grande Valley between Española and Bosque del Apache National Wildlife Refuge. In the Rio Grande valley, this species has also been captured along ditches and irrigation canals that have suitable habitat. This species is restricted to riparian areas with emergent wetlands or scrub/shrub riparian habitats with tall, dense herbaceous plants on moist soil. Typical plant species associated with meadow jumping mouse habitat include sedges (<i>Carex</i> spp.), rushes (<i>Juncus</i> spp.), and spikerush (<i>Eleocharis macrostachya</i>) with numerous species of grasses (e.g., <i>Agrostis</i> , <i>Poa</i> , <i>Agropyron</i> , and <i>Bromus</i>), forbs, and willows.	Unlikely to occur. Riparian areas with emergent wetlands or scrub/shrub riparian habitats with tall, dense herbaceous plants required for this species do not occur in the project area or vicinity.	No effect. No further analysis.

*** Federal (USFWS) Status Definitions:**

E = Endangered. Any species considered by the USFWS as being in danger of extinction throughout all or a significant portion of its range. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

T = Threatened. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The ESA specifically prohibits the take (see definition above) of a species listed as threatened.

*** U.S. Forest Service (USFS) Status Definitions:**

Management Indicator Species = MIS; Forest Service Sensitive = FSS.

*** State of New Mexico (NMDGF and EMNRD) Status Definitions:**

State Endangered = SE; State Threatened = ST.

Sources: Except where otherwise noted, range or habitat information for wildlife species is taken from BISON-M (2019), NMDGF (2018), USFWS Information for Planning and Consultation (USFWS 2019b), NatureServe (2019), Cartron (2010), EMNRD (2019), New Mexico Rare Plant Technical Council (NMRPTC) (1999).

Table 4.8. USFS SFNF Management Indicator Species, Regional Forester Sensitive Species, and State-Listed Special-Status Species for Santa Fe and San Miguel Counties, New Mexico

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Plants				
Santa Fe cholla (<i>Cylindropuntia viridiflora</i>)	State SE	Gravelly rolling hills in pinion-juniper woodland; 1,770–2,200 m (5,800–7,200 feet). Flowers in July.	Unlikely to occur due to the lack of pinion-juniper woodland habitats in the project area.	No impact. No further analysis.
Great Plains lady's tresses (<i>Spiranthes magnicamporum</i>)	State SE	Great Plains lady's tresses occur in wetlands and along stream banks, below 7,000 feet in elevation, where it can be found on moist to dry meadows, prairies, fields, and fens.	Unlikely to occur due to the lack of wetlands, streams, and species' elevational requirements in the project area.	No impact. No further analysis.
Tufted sand verbena (<i>Abronia bigelovii</i>)	USFS FSS	Habitat for the verbena consists of hills and ridges of gypsum in the Todilto Formation, from 5,700 to 7,400 feet in elevation (New Mexico Rare Plant Technical Council [NMRPTC] 1999). Populations are usually small and are restricted to gypsum or strongly gypseous soil derived from gypsum outcrops (NMRPTC 1999). Plants are conspicuous on the otherwise rather barren gypsum. In the SFNF, the tufted sand verbena is suspected on the Cuba and Coyote Ranger Districts.	Unlikely to occur due to the lack of gypsum soils of the Todilto Formation in the project area. In addition, the elevational requirements for the species are well below the elevation of the project area.	No impact. No further analysis.
Greene milkweed (<i>Asclepias uncialis</i> ssp. <i>uncialis</i>)	USFS FSS	Occurs in uplands of grasslands at 3,920–7,640 feet (at known locations in Colorado). Primarily associated with species typical of shortgrass prairie. Associated vegetation comprises mostly grasses (grama), forbs, and shrubs, with trees (juniper) typically comprising less than 15% of the total vegetation cover (Decker 2006). Plants are found on plains, open hills, or low slopes. Typically, they are found growing in open spaces (base soil) between bunch grasses on soils that are dry and warm. A specimen at UNM Herbarium documents Greene milkweed from Mesita de los Ladrones, Anton Chico Grant, SFNF.	Unlikely to occur due to the lack of grasslands in the project area. In addition, the elevational requirements for the species are well below the elevation of the project area.	No impact. No further analysis.
Chaco milkvetch (<i>Astragalus micromerius</i>)	USFS FSS	This diminutive endemic is usually associated with outcrops of sandstone that are blended with Todilto gypsum or limestone. Occurs on gypseous or limy sandstones in pinyon-juniper woodland or Great Basin desertscrub from 6,600 to 7,300 feet in elevation. Limited to the west side of the SFNF, Coyote, and Cuba Ranger Districts.	Unlikely to occur due to the lack of gypseous/limy sandstones in pinyon-juniper woodland and because the elevational requirements for the species are well below the elevation of the project area.	No impact. No further analysis.
Pecos mariposa lily (<i>Calochortus gunnisonii</i> var. <i>perpulcher</i>)	USFS FSS	This is a rare color form of a more common species. It is found only in the eastern part of the Pecos Wilderness. Grows in meadows and aspen glades in montane coniferous forest between 9,500 and 11,200 feet in elevation. Was known on Hermit's Peak but attempts to relocate the species have been unsuccessful. The lily is suspected only on the Pecos–Las Vegas Ranger District.	Unlikely to occur due to the lack of meadows and aspen glades in the project area. However, suitable montane coniferous forest exists in the project area.	See Section 5.3.1.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Yellow lady's-slipper [<i>Cypripedium parviflorum</i> var. <i>pubescens</i> (= <i>C. calceolus</i> var. <i>pubescens</i> , <i>C. pubescens</i>)]	USFS FSS State SE	Common in the northern and eastern U.S., this species reaches the southwestern extent of its range in Arizona and New Mexico. It is relatively common in northern New Mexico, but populations are small and scattered. This species requires moderate shade to nearly full sun in fir, pine, and aspen forests from 6,000 to 9,500 feet in elevation. It most often grows just above the banks of streams, usually 150 to 300 feet from water.	May occur as suitable montane coniferous forest exists in the project area.	See Section 5.3.2.
Robust larkspur (<i>Delphinium robustum</i>)	USFS FSS	This plant grows in canyon bottoms and aspen groves in lower and upper montane coniferous forests from approximately 7,200 to 11,200 feet in elevation. No specimens from Rio Arriba or Sandoval Counties are held at the UNM Herbarium, but Warnock (1997) in <i>Flora of North America</i> identifies this plant as occurring in the San Pedro and Jemez Mountains, which would include the Cuba and Jemez Ranger Districts, SFNF.	Unlikely to occur due to the lack of meadows and aspen glades in the project area. However, suitable montane coniferous forest exists in the project area.	See Section 5.3.3.
Wood lily (<i>Lilium philadelphicum</i>)	USFS FSS State SE	This species has only limited populations in New Mexico occurring in the understory of open mixed-conifer forests in areas where soils are humus, rich, and well-drained as well as out of direct sunlight between 7,600 and 8,260 feet in elevation. Also known in wooded sites in foothills in montane-subalpine habitats as well as in moist, wooded areas under aspen stands or bordering ponds. It flowers from mid-June to early August. Wood lily is known to occur in the Pecos Wilderness with the closest known populations along Forest Road 123A between Macho and Dalton Canyons and in upper Holy Ghost Canyon.	May occur. Although the elevation of the project area is outside the known elevation of the species, potentially suitable habitats exist in the project area.	See Section 5.3.4.
Heil's alpine whittlowgrass (<i>Draba heilii</i>)	USFS FSS	This is an alpine tundra plant known only from a small part of the Pecos Wilderness in the vicinity of Truchas and Santa Barbara peaks. It grows in alpine tundra in association with other low, caespitose or pulvinate alpine plants at approximately 12,100 feet in elevation. It appears to be a very narrow endemic (NMRPTC 1999).	Unlikely to occur due to the lack of alpine tundra in the project area.	No impact. No further analysis.
Pecos fleabane (<i>Erigeron subglaber</i>)	USFS FSS	This plant grows in subalpine meadows of high elevation coniferous forests in rocky, open meadow habitats from 10,000 to 11,500 feet in elevation (NMRPTC 1999).	Although suitable coniferous forest habitats exist in the project area, the elevational requirements for the species are above the elevation of the project area.	No impact. No further analysis.
Chama blazing star (<i>Mentzelia conspicua</i>)	USFS FSS	This plant is a narrow endemic of the upper Chama River valley in Rio Arriba County, New Mexico, where it grows in specialized habitat of gray to red shales and clays of the Mancos and Chinle Formations (NMRPTC 1999). This plant is early successional and is crowded out by more aggressive often introduced species like sweet clover. On the SFNF, on the Coyote and Cuba Ranger Districts.	Unlikely to occur due to this species only occurring on gray to red shales and clays of the Mancos and Chinle Formations, which does not occur in the project area.	No impact. No further analysis.
Springer's blazing star (<i>Mentzelia springeri</i>)	USFS FSS	Occurs in volcanic pumice and unconsolidated pyroclastic ash in pinyon-juniper woodland and lower montane coniferous forests from 7,000 to 8,000 feet in elevation (NMRPTC 1999). This species is narrowly endemic to loose volcanic substrate of the Jemez Mountains and is often seen where roads cut through pumice. Has not been documented on the SFNF.	Unlikely to occur due to this species only occurring on pumice in the Jemez Mountains, which is not in the project area.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Arizona willow (<i>Salix arizonica</i>)	USFS FSS	Associated with high-elevation sedge meadows and wet drainages in subalpine coniferous forest from 10,000 to 11,200 feet in elevation. In New Mexico, this species occurs in the southern Sangre de Cristo Mountains, Nacimiento Mountains, and southern San Juan Mountains. Occurs as a narrow, linear strip associated with perennial water in seeps, springs, streams sides and wet meadows. Sometimes found in drier sites adjacent to forest edges or within the riparian zone where subsurface channels provide moisture. Frequently associated with substrates of volcanic origin, and it appears to favor coarse-texture and well-watered soils, including those associated with alluvial deposits.	Although suitable coniferous forest habitats exist in the project area, the elevational requirements for the species are above the elevation of the project area.	No impact. No further analysis.
Invertebrates				
Ruidoso snaggletooth snail (<i>Gastrocopta ruidosensis</i>)	USFS FSS	Found on bare soil, under stones, and in thin accumulations of grass thatch and juniper litter on mid-elevation carbonate cliffs and xeric limestone grasslands along the eastern slopes of the Sangre de Cristo and Sacramento Mountains. This species occurs on the east side of the Sangre de Cristo Mountains in plant and leaf litter near limestone outcrops in juniper grasslands (Nekola and Coles 2010). Its highly restricted range invariably places this species vulnerable to persistence on the SFNF. It is a rather recent discovery on the SFNF and a new addition to the Regional Forester's sensitive species list of 2013 (USFS 2016).	Unlikely to occur due to the lack of mid-elevation carbonate cliffs or xeric limestone grasslands along the eastern slopes of the Sangre de Cristo mountains.	No impact. No further analysis.
Lake fingernailclam (<i>Musculium lacustre</i>)	State ST	This species occurs most frequently in high-elevation, deep-water marshes from Canada and Alaska south to the Sierra Nevada of California, and in the Rock Mountains of southern Utah (NMDGF 2018). In New Mexico, the lake fingernailclam is reported from Upper Cieneguilla Creek, Colfax County, near Angel Fire Recreation Area (NMDGF 2018). The sole New Mexico population occurs on private land managed for recreational uses.	Unlikely to occur due to the lack of high-elevation, deep-water marshes in the project area.	No impact. No further analysis.
Long fingernailclam (<i>Musculium transversum</i>)	State ST	Occurs in a variety of habitat types with sloughs, rivers, and large lakes. This is the only species of the genus restricted to perennial, and most often running, waters with substrates inhabited being variable, ranging from mud and sand to stones or rocks (NMDGF 2018). In New Mexico, populations are known from sites within the Canadian River Basin (Conchas River, Cabra Springs, Ute Creek near Gladstone) and Dry Cimarron River Basin (Clayton Lake, Road Canyon Creek). The largest known population in New Mexico was extirpated from the Pecos River below Carlsbad; however, an extant population occurs in the Black River (NMDGF 2018).	Unlikely to occur due to the lack of high-elevation, deep-water marshes in the project area.	No impact. No further analysis.
Lilljeborg peaclam (<i>Pisidium lilljeborgi</i>)	USFS FSS State SE	Found only in one high elevation lake in the Pecos Wilderness occurring at high latitude and altitude, this species occurs in the cold, alpine Nambe Lake, located in a glacial cirque approximately 11,300 feet in elevation. The surrounding habitat includes rocky talus, stands of Engelmann spruce and subalpine fir, and grass-sedge-forb communities. Its highly restricted range invariably places this species vulnerable to persistence on the SFNF. The lake in which they are found has not been assessed according to its reference condition (USFS 2016).	Unlikely to occur due to the lack of cold, alpine lakes in the project area.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Paper pondshell (<i>Utterbackia imbecillis</i>)	State SE	This species occurs in reservoirs, lakes, rivers, and streams. An extant population in New Mexico was documented by shells from Conchas Lake, San Miguel County (NMDGF 2018), hundreds of miles from the nearest known occurrences in adjacent states and northern México. The species has been documented from Ute Creek near Ute Reservoir, Harding County (NMDGF 2018).	Unlikely to occur due to the lack of large bodies of water in the project area.	No impact. No further analysis.
Fish				
Rio Grande sucker (<i>Catostomus plebeius</i>)	USFS FSS	The native range of the Rio Grande sucker includes the Rio Grande and its tributaries in northern New Mexico and southern Colorado, the Mimbres drainage in southwestern New Mexico, and streams of the Guzman Basin in northwestern Chihuahua (NMDGF 2018; Sublette et al. 1990).	Unlikely to occur in the project area due to the lack of perennial waterbodies	No impact. No further analysis.
Rio Grande chub (<i>Gila pandora</i>)	USFS FSS	Rio Grande chub is native to the Rio Grande and Pecos River drainages; possibly native to the Canadian drainage, although it may be introduced there (Sublette et al. 1990). Rio Grande chubs occupy perennial mainstream and tributary habitat at higher elevations (NMDGF 2018).	Unlikely to occur in the project area due to the lack of perennial waterbodies. May occur in the Pecos River, over 6 miles downstream from the project area.	No impact. No further analysis.
Arkansas River shiner (<i>Notropis girardi</i>)	State SE	In New Mexico, the species occurred in the Canadian River drainage from the vicinity of Sabinoso downstream to the Texas border. Arkansas River shiners occupy stream reaches characterized by extremes in discharge and are commonly found in main channel shallow habitats with slow velocity and shifting sand and small gravel substrates (NMDGF 2018; Sublette et al. 1990).	Unlikely to occur in the project area due to the lack of perennial waterbodies.	No impact. No further analysis.
Rio Grande cutthroat trout (<i>Oncorhynchus clarki virginalis</i>)	USFS MIS, FSS	Found primarily in clear, cold mountain lakes and streams at elevations of 6,000 feet and above in Colorado and New Mexico within the Rio Grande Basin (Sublette et al. 1990). In New Mexico, this species exists in mountain streams primarily within the Sangre de Cristo and Jemez Mountain ranges within the Carson National Forest and SFNF (Sublette et al. 1990).	Unlikely to occur in the project area due to the lack of perennial waterbodies. However, this species does occur within drainages within 2 miles downstream of the project area.	See Section 5.2.1.
Suckermouth minnow (<i>Phenacobius mirabilis</i>)	State ST	In New Mexico, the species' historical range includes only the Canadian and Dry Cimarron Rivers, although it has been introduced, probably via bait bucket, to the Pecos River near Fort Sumner. Suckermouth minnow most commonly occupies shallow, moderate-velocity runs over sand and pea gravel bottoms (NMDGF 2018; Sublette et al. 1990).	Unlikely to occur in the project area due to the lack of perennial waterbodies.	No impact. No further analysis.
Birds				
Mourning dove (<i>Zenaida macroura</i>)	USFS MIS	They can be found in higher elevation communities but are typically regarded as casual above 7,000 feet. They nest in a variety of habitats including shrub lands and forests.	May occur as suitable forest and woodland habitat types occur in the project area.	See Section 5.2.2.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Hairy woodpecker (<i>Picoides villosus</i>)	USFS MIS	Hairy woodpecker is an indicator species for mature forest and woodland habitats. Hairy woodpeckers are found in woodlots, suburbs, parks, and cemeteries, as well as forest edges, open woodlands of oak and pine, recently burned forests, and stands infested by bark beetles. They can be found equally commonly in coniferous forests, deciduous forests, or mixtures, and generally up to approximately 6,500 feet in elevation (Cornell Lab of Ornithology 2015).	May occur as suitable forest and woodland habitat types occur in the project area.	See Section 5.2.3.
Pinyon jay (<i>Gymnorhinus cyanocephalus</i>)	USFS MIS	Pinyon jays are variably residents in mainly middle elevation areas containing pinyon-juniper woodlands almost statewide and are considered uncommon to locally abundant (Hubbard 1978).	Unlikely to occur in the project area due to the lack of pinyon-juniper woodlands.	No impact. No further analysis.
Merriam's wild turkey (<i>Meleagris gallopavo merriami</i>)	USFS MIS	This species uses a variety of forest or woodland habitat types, including forest and open woodland, scrub oak, deciduous, mixed deciduous-coniferous areas, hardwood forests/woodlands, cropland/hedgerow, and shrubland/chaparral. Merriam's wild turkey is known to occur from 6,000 to 12,000 feet in elevation and usually nests on the ground in shade and on north-facing slopes in coniferous forests between 7,000 and 9,500 feet in elevation.	May occur as suitable forest and woodland habitat types occur in the project area.	See Section 5.2.4.
Baird's sparrow (<i>Centronyx bairdii</i> ; <i>Ammodramus bairdii</i>)	NM ST	This species is a winter resident in New Mexico. It has been found on Otero Mesa and in the Animas Valley and may occur in other areas of suitable winter habitat, particularly in the southeast portion of the state. Generally, prefers dense, extensive grasslands with few shrubs. Avoids heavily grazed areas. In New Mexico, birds are primarily migrants moving through the eastern plains and southern lowlands, but wintering birds occur locally in southern grasslands, particularly in Otero, Luna, and Hidalgo Counties.	Unlikely to occur in the project area due to lack of dense, extensive grasslands with few shrubs.	No impact. No further analysis.
Broad-billed hummingbird (<i>Cynanthus latirostris</i>)	NM ST	This widespread Mexican species reaches its northern geographic limits in the borderlands region of the southwestern United States, where it inhabits low to mid-elevation riparian woodlands. In New Mexico, the species is a regular summer resident in Guadalupe Canyon, Hidalgo County, where it tends to nest in hackberry thickets and similar vegetation (NMDGF 2018). Known to occur in the Peloncillo Mountains. In addition, there have been confirmed records for Bernalillo, Doña Ana, Eddy, Grant, Otero, San Miguel, and Valencia Counties, but there has been no documented breeding in any county other than Hidalgo.	Unlikely to occur due to the lack of riparian woodland habitats in the project area.	No impact. No further analysis.
White-eared hummingbird (<i>Hylocharis leucotis</i>)	NM ST	This species of Mexican and Central American highlands reaches its northernmost geographic limits in the mountains of southeastern Arizona and southwestern New Mexico (NMDGF 2018). This hummingbird prefers relatively moist montane forests and forested canyons and is found most commonly in the pine and pine-oak zones. White-eared hummingbirds occur in the Animas Mountains, Peloncillo Mountains, Pinos Altos Mountains, and the Mogollon Mountains. Vagrants also have strayed farther north and east to the Manzanita Mountains, Sangre de Cristo Mountains, and to the Sacramento Mountains.	Although the project area contains moist montane forests, the project area is outside of the known range of the species. Migratory vagrants are unlikely to occur in the project area.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Violet-crowned hummingbird (<i>Amazilia violiceps</i>)	NM ST	This hummingbird of the Mexican highlands reaches its northernmost geographic limits in southeastern Arizona and southwestern New Mexico. In New Mexico, it summers regularly only in broadleaf riparian woodlands of sycamore, cottonwood, hackberry, and oak in Guadalupe Canyon, Hidalgo County, where it nests exclusively in sycamores (Zimmerman and Levy 1960; Baltosser 1986, 1989; Williams 2002). Single vagrants have strayed east to Luna County in 2002 and north to Socorro County in 1981, Santa Fe County in 1999, and Los Alamos County in 2005.	Unlikely to occur in the project area due to the lack of riparian woodland habitats.	No impact. No further analysis.
Gray vireo (<i>Vireo vicinior</i>)	USFS FSS NM ST	Strongly associated with pinyon-juniper and scrub oak habitats. Distributed mainly across the western two-thirds of the state. Prefers gently sloped canyons, rock outcrops, ridge tops, and moderate scrub cover.	Unlikely to occur in the project area due to lack of pinyon-juniper and scrub oak habitat.	No impact. No further analysis.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	USFS FSS NM ST	Occurs in New Mexico year-round. Breeding is restricted to a few areas mainly in the northern part of the state along or near lakes. In migration and during winter months, the species is found chiefly along or near rivers and streams and in grasslands associated with large prairie dog (<i>Cynomys</i> sp.) colonies. Nests in tall trees commonly near bodies of water where fish and waterfowl prey are available.	Unlikely to occur in the project area due to the lack of streams, large bodies of water, and prairie dog colonies.	No impact. No further analysis.
Common black hawk (<i>Buteogallus anthracinus</i>)	NM ST	This Neotropical raptor reaches its northern geographic limits in the southwestern United States, where it is an uncommon but regular summer resident in New Mexico. Historically, this species was largely restricted to the San Francisco, Gila, and Mimbres drainages; however, there are rare but increasing observations east to the middle Rio Grande Valley, the Hondo Valley, and the middle and lower Pecos Valley, and in 2003, nesting was reported farther north along the Canadian River for the first time. Breeding birds require mature, well-developed riparian forest stands (e.g., cottonwood bosques) located near permanent streams where principal prey species (fish, amphibians, and reptiles) are available (NMDGF 2018).	Unlikely to occur in the project area due to the lack of mature, well-developed riparian forest stands near permanent streams.	No impact. No further analysis.
Brown pelican (<i>Pelecanus occidentalis</i>)	NM SE	This coastal marine and estuarine species breeds from California and the mid-Atlantic states southward to South America. Brown pelicans are rare/accidental visitors inland to New Mexico; they can occur during all seasons but are most frequently observed during summer through fall. Most reports are from large lakes/reservoirs or along major rivers, including the San Juan, Rio Grande, Canadian, Gila, and Pecos drainages (NMDGF 2018).	Unlikely to occur due to the lack of major rivers and perennial waterbodies in the project area.	No impact. No further analysis.
Least tern (<i>Sterna antillarum athalassos</i>)	USFWS E USFS FSS NM SE	Migratory species occurring in North America during the breeding season, when it is associated with water (e.g., lakes, reservoirs, and rivers). Nests on the ground, especially sandy rivers, sand bars, beaches, and playas that are relatively free of vegetation. In New Mexico, this summer resident is an occasional visitor to wetlands in at least 18 New Mexico counties, but is only known to breed at Bitter Lake National Wildlife Refuge in Chaves County and farther south in the Pecos Valley at Brantley Reservoir in Eddy County.	Unlikely to occur due to the lack of perennial river bodies in the project area. The project area is also outside of the species' known breeding range within the state.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Northern goshawk (<i>Accipiter gentilis atricapillus</i>)	USFS FSS	Strongly associated with montane forested areas with moderate space between trees (for foraging) such as ponderosa pine, aspen, white, and Douglas-fir. Canopy cover generally over 40%, nesting areas usually higher canopy cover. Migrating populations typically follow forested ridges.	May occur as suitable montane forest and woodland habitats occur in the project area.	See Section 5.3.5.
Peregrine falcon (<i>Falco peregrinus</i>)	USFS FSS NM ST	Found in New Mexico year-round. Various open habitats from grassland to forested in association with suitable nesting cliffs. In migration and during winter months, New Mexico's peregrine falcons are typically associated with water and large wetlands. In New Mexico, the breeding territories of peregrine falcons center on cliffs that are 200 feet high or more and located in wooded/forest habitats, adjacent to large expanse of area for foraging (BISON-M 2019).	Unlikely to occur due to the lack of suitable forested habitats with cliffs in the project area. However, foraging and flyovers are possible.	No impact. No further analysis.
White-tailed ptarmigan (<i>Lagopus leucura</i>)	USFS FSS State SE	White-tailed ptarmigan primarily inhabit alpine ecosystems at or above treeline (10,500 feet in elevation) throughout the year, though under some circumstances during winter they may forage and roost in riparian areas, meadows, or burns at lower elevations. In New Mexico, the species occurs at least seasonally on suitable peaks and ridgelines above treeline in the Sangre de Cristo Mountains. The present-day distributional range is essentially the same as the historical range, extending from the Colorado state line southward to the high peaks above the city of Santa Fe (Wolfe et al. 2011, Braun and Williams 2015). Suitable habitats for this species are naturally discontinuous and are often broadly separated by intervening forests and valleys. In the SFNF, this species uses the Alpine and Tundra Ecological Response Units of the Santa NF (<1% of the forest), which is only found on the Northeast local zone.	Unlikely to occur in the project area due to the lack of alpine habitat and riparian habitat, as well as outside of the elevational requirements.	No impact. No further analysis.
Boreal owl (<i>Aegolius funereus</i>)	USFS FSS State ST	The boreal owl occurs mainly above 9,500 feet in elevation in spruce-fir forests. Surveys through 1996 showed this species to be resident in very small numbers in spruce-fir and similar habitat in the Jemez mountains; as of 1996, no boreal owls have been observed south of the Valles Caldera; this information is confirmed by review of the Natural Heritage database (BISON-M 2019). In the Rockies, they generally occur in mature, multilayered spruce-fir forest. They roost in dense cover by day, in cool micro sites in summer, frequently changing roost site. Nests are in tree holes, natural cavities, or old woodpecker holes. Nest site may be used in consecutive years.	Unlikely to occur in the project area due to the lack of spruce-fir forest habitat as well as outside of the elevational requirements.	No impact. No further analysis.
Western burrowing owl (<i>Athene cunicularia</i>)	USFS FSS	Burrowing owls summer and variably winter statewide in New Mexico and are considered rare to common (Hubbard 1978). They breed in grasslands, desert shrubland, prairies, or open areas near human habitation, especially golf courses, and airports at lower to middle elevations (2,800–7,500 feet).	Unlikely to occur in the project area due to the lack of grassland habitat and prairie dog colonies to provide suitable burrow habitat.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	USFWS T USFS FSS	Breeds mostly in dense riparian deciduous stands, including forest edges, tall thickets, dense second growth, overgrown orchards, scrubby oak woods. Often in willow groves around marshes. This species prefers riparian woodlands with mixed willow-cottonwood vegetation, mesquite-thornforest vegetation, or a combination of these that contain habitat for nesting and foraging. This species could use limited riparian habitat on the SFNF but is only known as a migrant species. There are no known locations of this species on the SFNF, but slight potential to use bosque areas during migration along the Rio Grande or Jemez River. This species is unlikely to become established on the SFNF since its critical habitat required for the species does not occur in the SFNF. This species is not present on the forest and not likely to become established (USFS 2016).	Unlikely to occur in the project area due to the lack of dense riparian deciduous forest stands and streamside groves.	No impact. No further analysis.
Amphibians				
Northern leopard frog (<i>Lithobates pipiens</i>)	USFS FSS	The northern leopard frog ranges in a variety of habitats (springs, marshes, wet meadows, riparian areas, vegetated irrigation canals, ponds, and reservoirs) but requires a high degree of vegetative cover for concealment (NatureServe 2009 and BISON-M 2019). In New Mexico they are known from approximately 3,600 to 10,000 feet and breed in ponds or lake edges with fairly, dense aquatic emergent vegetation from April–July and again from September–October (Degenhardt et al. 1996). This riparian species requires springs, slow streams, or other perennial water as habitat and for overwintering; during warmer months they may be found in wet meadows or other habitats near standing water and these habitats are limited on the SFNF.	Detected during surveys in the project area. Suitable habitats with water sources occur in and near the project area.	See Section 5.3.6.
Mammals				
Pale Townsend's big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	USFS FSS	Found in a variety of xeric to mesic habitats: scrub-grassland, desertscrub, semi-desert shrublands, chaparral, saxicoline brush, tundra, open montane forests, spruce-fir, mixed hardwood-conifer, and oak woodlands and forests. This species is strongly correlated to the availability of caves or cave-like habitat, but it also uses abandoned buildings and rock crevices on cliffs for roosting.	May occur due to suitable woodland habitats and water sources near the project area.	See Section 5.3.7.
Spotted bat (<i>Euderma maculatum</i>)	USFS FSS State ST	In New Mexico, spotted bats have been taken in areas near cliffs, including pinyon-juniper woodlands and from streams or water holes within ponderosa pine or mixed coniferous forest. It has also taken over cattle tanks in a meadow surrounded by mixed coniferous forest and near a ridge with cliffs and limestone outcroppings. The spotted bat is usually captured around a water source, including desert pools or cattle tanks. It also may use rivers or desert washes as travel corridors.	May occur due to suitable woodland habitats and water sources near the project area.	See Section 5.3.8.
Gunnison's prairie dog (prairie and montane populations) (<i>Cynomys gunnisoni gunnisoni</i>)	USFS FSS	Found in montane grassland, juniper savanna, plains-mesa grassland, Great Basin desertscrub, plains-mesa and scrub, desert grassland vegetation.	Unlikely to occur in the project area due to the lack of grassland habitats.	No impact. No further analysis.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Masked shrew (<i>Sorex cinereus</i>)	USFS FSS	Confined primarily to riparian habitats in subalpine coniferous forest in the Sangre de Cristo, Jemez, and San Juan Mountains, usually above 9,500 feet in elevation. It has been found along the banks of cold streams, in springy meadows, or under logs in the cold spruce woods.	Unlikely to occur in the project area due to the lack of cold streams, cold spruce woods and meadow habitats. Logs would remain undisturbed.	No impact. No further analysis.
Water shrew (<i>Sorex palustris</i>)	USFS FSS	Water shrews are confined to the Sangre de Cristo, Jemez, and San Juan Mountains. They occur near permanent streams, seldom descending below 8,000 feet in elevation. Habitat consists of small, cold streams with dense overhanging growth. They are also found along the margins of ponds, lakes, marshes, and bogs. Overhanging banks, boulders, tree roots, logs, etc. provide cover.	Unlikely to occur in the project area due to the lack of cold streams and lentic habitats.	No impact. No further analysis.
Preble's shrew (<i>Sorex preblei</i>)	USFS FSS	Found near permanent or intermittent streams in arid to semi-arid shrub or grasslands and to a lesser extent dense high-elevation coniferous forests. In general, their habitat is confined to riparian or riparian like (springs, seeps, etc.) conditions. Probably forages on small, soft-bodied invertebrates found in riparian areas. Elevational range is approximately 4,200 to 8,366 feet.	Unlikely to occur in the project area due to the lack of cold streams and riparian habitats.	No impact. No further analysis.
Goat peak pika (<i>Ochotona princeps nigrescens</i>)	USFS FSS	Restricted to the Jemez Mountains. Restricted to rocky talus slopes, primarily the talus-meadow interface (Smith and Weston 1990, BISON-M 2019), often above tree line in alpine and subalpine areas (BISON-M 2019). Feeds primarily on grasses and sedges; but also eat some flowering plants and roots of woody vegetation in the summer (BISON-M 2019).	Unlikely to occur in the project area due to the lack of rocky talus slopes/talus meadow habitats, elevation requirements of the species, and the project area is not in the Jemez Mountains.	No impact. No further analysis.
American pika (<i>Ochotona princeps saxatilis</i>)	USFS FSS	Restricted to rocky talus slopes, primarily the talus-meadow interface (Smith and Weston 1990), often above tree line in alpine and subalpine areas (BISON-M 2019). As low as 11,000 feet in elevation in New Mexico. Feeds primarily on grasses and sedges; but also eat some flowering plants and roots of woody vegetation in the summer (BISON-M 2019).	Unlikely to occur in the project area due to the lack of rocky talus slopes/talus meadow habitats and the elevation requirements of the species.	No impact. No further analysis.
Pacific marten (<i>Martes caurina</i> ; <i>Martes americana</i>)	USFS FSS State ST	In New Mexico, the species is known only from the north-central mountains including the San Juan and Sangre de Cristo ranges between 7,000 to 13,000 feet in elevation, but mostly above 9,000 feet (Findley et al. 1975; NMDGF 2018). Habitat in New Mexico includes dense deciduous, mixed, coniferous, spruce-fir forests (Findley et al. 1975; NMDGF 2018). Mature/old-growth spruce-fir forests with greater than 30% canopy cover and abundant coarse woody debris (i.e., snags, down fall, etc.) have been identified as preferred marten habitat throughout the range of the species (NMDGF 2018).	May occur due to suitable woodland habitats in the project area. However, potential suitable habitat would remain unchanged and large mature trees would not be cut.	See Section 5.3.9.

Common Name (Scientific Name)	Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Canada lynx (<i>Lynx canadensis</i>)	USFS FSS	Canada lynx generally occur in Canada and other alpine areas and in the Rockies, generally above 9,500 feet in elevation, in boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth. This species also sometimes enters open forest, rocky areas, and tundra to forage for abundant prey. An individual animal wandering south from Colorado could occasionally use the forest while exploring for territory; however, climate change models (Lawler, Shafer et al. 2009) predict decreased potential for use. There is no solid prey base to support a population of lynx since snowshoe hare populations are of concern on the SFNF. There is no critical habitat present on the SFNF. This species is not present on the forest and not likely to become established. Canada lynx has not been documented to den or breed on the SFNF. Wandering individuals have been verified in New Mexico, but habitats in the state are thought to be incapable of supporting a self-sustaining population (BISON-M 2019).	Unlikely to occur in the project area due to the lack of a solid prey base and lack of suitable habitats.	No impact. No further analysis.
Rocky Mountain elk (<i>Cervus elaphus nelsoni</i>)	USFS MIS	Rocky Mountain elk are primarily grazers and inhabit most forest types with good forage and cover. Elk use high elevation woodlands consisting of spruce-fir, Douglas-fir, aspen, and/or lodgepole pine stands combined with alpine and sub-alpine meadows during the summer. Transitional ranges include lower elevation aspen stands in conjunction with montane coniferous forests. Winter range includes low-elevation aspen, gamble oak, pinyon, juniper, and sagebrush, especially where sagebrush slopes interface with ponderosa pine and aspen groves. Agricultural fields also provide winter range habitat used by some elk in areas adjacent to the forest. Willow-covered stream corridors are also important and are used both for cover and forage. Aspen is an especially important habitat component, potentially used by elk year-round for forage, cover and calving.	Observed during surveys in the project area. Known to also occur in the surrounding areas. Suitable woodland habitats are in the project area. If elk are disturbed by the project, they would likely return after project completion.	See Section 5.2.5.

*** Federal (USFWS) Status Definitions:**

E = Endangered. Any species considered by the USFWS as being in danger of extinction throughout all or a significant portion of its range. The ESA specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

T = Threatened. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The ESA specifically prohibits the take (see definition above) of a species listed as threatened.

*** U.S. Forest Service (USFS) Status Definitions:**

Management Indicator Species = MIS; Forest Service Sensitive = FSS.

*** State of New Mexico (NMDGF and EMNRD) Status Definitions:**

State Endangered = SE; State Threatened = ST.

Sources: Except where otherwise noted, range or habitat information for wildlife species is taken from BISON-M (2019), NMDGF (2018), USFWS Information for Planning and Consultation (USFWS 2019b), NatureServe (2019), Cartron (2010), ENMRD (2019), and NMRPTC 1999.

5 ANALYSIS OF SPECIES

5.1 Federally Threatened and Endangered Species

5.1.1 *Holy Ghost Ipomopsis (Ipomopsis sancti-spiritus)*

This species was listed as endangered in the *Federal Register* with an effective date of April 22, 1994 (USFWS 1994). Critical habitat is not being designated. The HGI recovery plan was finalized in 2002 (USFWS 2002).

DISTRIBUTION AND HABITAT CHARACTERISTICS

HGI grows on relatively dry, steep, west- to southwest-facing slopes on Tererro Limestone substrates in Holy Ghost Canyon from 7,730 to 8,220 feet in elevation (USFWS 2002). HGI usually grows in open areas relatively free of dense grass cover within Rocky Mountain montane conifer forest communities with species such as ponderosa pine, Douglas-fir (*Pseudotsuga menziesii*), quaking aspen, Gambel oak, and mountain mahogany (*Cercocarpus montanus*). Flowers from July to September. HGI appears to grow best in bare mineral soils with its highest densities on disturbed sites such as road cuts. The upper Pecos River watershed is the only known location where the species grows natively. Experimental populations have been introduced to canyons immediately north and south of Holy Ghost Canyon (Indian Creek, Winsor Creek, Panchuela Creek), but have had, so far, mixed results in terms of survival. No other populations of this species are known at this time (Roth 2018; USFWS 2002).

HABITAT ANALYSIS

Although the elevation of the project area is outside the known elevation of the species, potentially suitable habitats exist in the project area. Some portions of south- and southwest-facing slopes in the project area may consist of habitat similar in appearance to the known habitat for HGI along Forest Road 122 in Holy Ghost Canyon. This similar habitat has dry, year-round exposure to the sun and has slopes similar to the known habitat for this species. This species was not observed in the project area during the biological survey, which was not conducted during its flowering season, although suitable habitat may be present in the project area. This species was also not observed during the formal surveys for listed and rare plant species on August 30, 2019, which was conducted during the flowering season for HGI. It was also not observed during the general biological surveys or the MSO or NOGO protocol surveys, in July and August 2019. A secondary access to the project area along Indian Creek Road also goes by the enclosure where HGI experimental populations have been introduced. However, the project would not be accessed along the road that passes by the HGI site. The species at the Indian Creek Transplant area has been impacted in recent years by trampling and cattle grazing (Roth 2018), but it is now fenced off to alleviate those impacts.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would not result in the loss of HGI or suitable habitat. Although some suitable habitats exist in the project area, the nearest proposed disturbance area is approximately 2,000 meters distant from the 2006 Indian Creek Transplant area. The proposed action would occur during the end of the flowering season in the month of September after the LOP. The currently known elevational requirements for the species are below the elevation of the project area by a few hundred feet (Roth 2018; USFWS 2002). However,

existing forest roads accessing the project area via Indian Creek Road pass through elevations within the range of the species. Several sites in the project area could support HGI as there are dry, steep, west- to southwest-facing slopes in open areas relatively free of dense grass cover. The project area is also disturbed by historic exploration and mining activities, which may support the species because it grows well on disturbed sites. This species was not observed in the project area during the biological survey, which was conducted before the flowering season. In addition, the species was not observed on subsequent site visits during MSO and NOGO protocol surveys. A formal survey for HGI was conducted during the flowering season on August 20, 2019, and the species was not observed within the project area. Additionally, the access route to the project area was walked by SFNF Biologist M.D. Burton and New Mexico State Botanist D. Roth, with no observation of HGI. It is very unlikely that HGI is present in the project area. However, if the species is present, machinery and equipment activities may cause direct mortality by crushing and compaction of soils (Botany RPM 1-10). Though the HGI exclosure area is located approximately 250 meters from Forest Road 192, to minimize potential negative effects, Comexico has committed to refraining from use of Forest Road 192 (Botany RPM 5). In addition, the RPMs described in Appendix B would be used to prevent the introduction and to control of noxious weeds during the proposed action (Botany RPM 1-4, 7, 9). Additionally, if HGI is later discovered in the project area, appropriate mitigations would occur, such as flagging and avoidance (Botany RPM 6). All machinery, vehicles, and equipment would be weed free prior to entering the project area and would be staged/parked in weed-free areas (Botany RPM 1-4).

Overall, the potential adverse effects would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling and associated activities (Botany RPM 1-10). There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project has been analyzed as described above and determined to have the following potential effects to HGI within the project area: **No Effect** – will not affect the HGI.

5.1.2 *Mexican Spotted Owl (Strix occidentalis lucida)*

This species was listed as endangered in the *Federal Register* with an effective date of April 15, 1993, and critical habitat was designated in the *Federal Register* with an effective date of September 30, 2004 (USFWS 1993, 2004). The MSO recovery plan was finalized in 1995, and the first revision completed in 2012 (USFWS 1995, 2012b).

DISTRIBUTION AND HABITAT CHARACTERISTICS

The project area shown in Appendix A is located entirely within MSO designated critical habitat. The project area shown in Figure A.3 also overlaps with the Indian Creek Protected Activity Center (PAC). The Macho Canyon PAC is south approximately 1.14 miles from the project area. PACs are intended to sustain and enhance areas that are presently, recently, or historically occupied by breeding MSOs, and must be at least 600 acres (USFWS 2012a; USFS 1987).

The MSO habitat areas are presented in Table 5.1. The project area and Analysis Area overlaps approximately 1.7 acres and 667.67 acres of the Indian Creek PAC, respectively. The project area also falls within 0.27 acre of Protected areas for the MSO, as described in the SFNF Land and Resource Management Plan (LRMP) for the SFNF, adopted in 1987, and as amended in 1996 and 2004 (USFS 1987) and the MSO Final Recovery Plan (USFWS 2012a) (see Figure A.3 in Appendix A). The Analysis Area overlaps approximately 114.96 acres of Protected areas for the MSO. Project area and Analysis Area

acreages within MSO Recovery Habitat is listed in Table 5.1 by the USFS Terrestrial Ecological Unit (TEU) type, which is Mixed Conifer–Frequent Fire. The entire project area and Analysis Area are within designated MSO critical habitat. Mixed conifer is also potentially suitable nest/roost habitat.

Table 5.1. Approximate Acreage of MSO Habitat Areas in the Project and Analysis Areas

Habitat Area	Project Analysis Area Acres [‡]	Project Area Acres [‡]
Total Acres	2,541.37	7.72
Protected Area Habitat	574.39 (~23% of Analysis Area)	3.06 (~0.23% of RA in the Analysis Area)
Recovery Habitat	TEU* 212: 75.4 (~3.0% of Analysis Area)	TEU 213: 1.35 (~17.76% of Project Area)
	TEU 213: 863.88 (~33.99% of Analysis Area)	TEU 228: 3.56 (~44.21% of Project Area)
	TEU 228: 925.62 (~36.42% of Analysis Area)	TEU 351: 0.08 (~1.05% of Project Area)
(Forest Type: Mixed Conifer–Frequent Fire; potentially suitable nest/roost habitat)	TEU 351: 130.98 (~5.15% of Analysis Area)	TEU 353: 2.29 (~30.13% of Project Area)
	TEU 352: 5.35 (~0.21% of Analysis Area)	TEU 6: 0.52 (~6.84% of Project Area)
	TEU 353: 323.21 (~12.72% of Analysis Area)	
(Riparian Type: Narrowleaf Cottonwood / Shrub)	TEU 6: 26.50 (~1.04% of Analysis Area)	
Total Recovery Habitat	2,350.98 (~92.51% of Analysis Area)	7.72 (100% of Project Area)
Critical Habitat	1,677.25	6.03
Protected Activity Center Habitat	667.67	3.04

* TEU = Terrestrial Ecological Unit.

‡ Numbers rounded to the nearest 0.1.

Prior to 2019, the last recorded MSO observation near the project area was a single individual in 2014. SWCA completed MSO protocol surveys in the project area and vicinity of Jones Hill. MSO detections at the project area are shown in Figure A.3 in Appendix A. MSO observations in the project area and to the south were all individual male detections. No females or pairs were observed in 2019 or 2020. Within the Analysis Area, 6 individual male MSO were observed in 2019 and 5 individual male MSO were observed in 2020. Suitable habitat, as described below, is present throughout the project area and surrounding area. The closest MSO detection in 2019 was an individual male from June 3 and is approximately 330 feet to the north of Drill Site #16 (see Figure A.2 in Appendix A).

According to the USFWS (2019d) species profile, MSOs require the following habitat characteristics:

Spotted owls are residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components. In southern Arizona and New Mexico, the mixed conifer, Madrean pine-oak, Arizona cypress, Encinal oak woodlands, and associated riparian forests provide habitat in the small mountain ranges (Sky Islands) distributed across the landscape. Owls are also found in canyon habitat dominated by vertical-walled rocky cliffs within complex watersheds, including tributary side canyons. Rock walls with caves, ledges, and other areas provide protected nest and roost sites. Canyon habitat may include small, isolated patches or stringers of forested vegetation including stands of mixed-conifer, ponderosa pine, pine-oak, pinyon-juniper, and/or riparian vegetation in which owls regularly roost and forage. Owls are usually found in areas with some type of water source (i.e., perennial stream, creeks, and springs, ephemeral water, small pools from runoff, reservoir emissions). Even small sources of water such as small pools or puddles create humid conditions. Roosting and nesting habitats exhibit certain identifiable features, including large trees [those with a trunk diameter of 12 inches (30.5 centimeters) or more (i.e., high tree basal area)], uneven aged tree stands, multi-storied canopy, a tree canopy creating shade over 40 percent or more of the ground (i.e., moderate to high canopy

closure), and decadence in the form of downed logs and snags (standing dead trees). Canopy closure is typically greater than 40 percent. Owl foraging habitat includes a wide variety of forest conditions, canyon bottoms, cliff faces, tops of canyon rims, and riparian areas. Juvenile owls disperse into a variety of habitats ranging from high-elevation forests to pinyon-juniper woodlands and riparian areas surrounded by desert grasslands. Observations of long-distance dispersal by juveniles provide evidence that they use widely spaced islands of suitable habitat that are connected at lower elevations by pinyon-juniper and riparian forests.

HABITAT ANALYSIS

MSO detections have occurred within and surrounding the project area because suitable MSO habitat, as described above, is present in the forest. All the areas of proposed drilling activities are located within designated final critical habitat for this species (USFWS 2004).

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would not occur during the MSO breeding season and therefore would not impact nesting or breeding activity. Drilling activities can produce noise and vibrations along with the presence of increased human activity and equipment could disrupt and displace MSO if they are present in the area. Drilling activities will not occur during the breeding season, so no impacts would occur that could result in changing behavior and/or flushing from their perches as well as altering MSO nesting or roosting activities. However, outside of the breeding season drilling could disrupt MSO from perches/roosts if they are present in the vicinity of the project area. RPMs to avoid or minimize environmental harm are included in the project specific to MSO and the 1995 and 2012 Recovery Plans (USFWS 1995, 2012b) (MSO RPM 1-5; see Appendix B for the RPMs). The LOP specifically for MSO suitable habitat within 0.5 mile of the project area would be in effect from March 1 through August 31 (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS (MSO RPM 3; General Wildlife RPM 4). Equipment proposed for the project would be expected to create noise levels of approximately 114 dBA at the site, but decrease to below 60 dBA within 50 meters. However, the extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery (NOGO RPM 1, 3; General Wildlife RPM 4, 12). Lighting for safe work conditions at night could also disrupt MSO foraging activities as the species hunts at dusk and throughout the night until just before sunrise. Comexico would shade exterior construction lighting for downward display to the extent possible for safety, to prevent lights from being viewed beyond the work area and upwards affecting the night sky (General Wildlife RPM 8).

As part of the proposed action, road work activities would occur prior to implementation of drilling activities and mitigation measures and RPMs would be incorporated as part of the proposed action (General Wildlife RPM 1-24; NOGO RPM 1-3; Watershed and Aquatic Resources RPM 1-26; Botany RPM 1-10). Drilling activities are proposed to occur outside of the breeding season and therefore no impacts would occur to nesting and breeding activity. No trees, alive or dead, of sufficient size or age, for MSO nesting or roosting would be cut down for this project (General Wildlife RPM 1, 2, 3, 4, 9, 16). Some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Trees less than 6 inches dbh do not provide nesting or roosting habitat, thus removal of these trees would not alter the availability and function of MSO nest/roost habitat (General Wildlife RPM 1, 2, 3, 4, 9, 16). Many of the trees proposed to be removed are within the existing USFS

forest road footprint and would only be removed if absolutely necessary. No nest/roost habitat or habitat components (e.g., large logs, large snags, hardwoods) will be altered by the Project during implementation. Areas immediately along Forest Roads would likely not be the preferred location for MSO nesting due to a slightly higher level of human presence. Trees within this small size range that would be removed are only used by MSO as part of foraging areas, which are abundant across the Analysis Area and therefore would not be substantially altered by the removal of trees, near roads, and on less than 2 total acres, as part of this project. It is expected that less than 3% of these trees to be removed are over 5 inches dbh, and no trees would be removed that are over 6 inches dbh. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation. See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action.

Although nest locations were not identified during MSO surveys, nest/roost habitat is assumed to occur within the mixed conifer habitat in the project area. The Indian Creek PAC overlaps the southwestern part of the project area and the well/staging/laydown area occurs within the boundaries of the Indian Creek PAC. As mentioned above, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites and along access routes to accommodate equipment (General Wildlife RPM 1, 2, 3, 4, 9, 16). These trees as well as downed snags will be replaced during reclamation in coordination with SFNF to help sustain trees for future nest/roost habitat while also maintaining forest canopy gaps. Additionally, the LOP will apply for activities within 0.5 mile of the project area and would be in effect from March 1 through August 31 (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). Project activities are not occurring during the breeding season, so no impacts to breeding are expected to occur in the project area or within the Indian Creek PAC. However, project activities may alter winter roosting sites if MSO remain in the area rather than altitudinally migrating.

The impacts of the proposed action would be localized, and any MSO that are flushed away are expected to return to the project area after implementation. After drilling, the drill sites would be reclaimed as required under any permits according to the RPMs and BMPs outlined in Appendix B. Each drill site would remain part of the road footprint and revegetate over time through reclamation, which would allow for the establishment of early successional vegetation such as grasses, forbs, and shrubs. This post-drilling vegetation would again provide foraging habitat for MSO. During implementation, MSO would be able to move to other parts of the forest to avoid prolonged disturbance associated with the drilling. However, an MSO avoiding the area may likely move into another MSO territory and could be threatened by other MSOs protecting their territory. This may cause harm to the individual MSO, but more likely cause competitive exclusion for resources. Implementation would not occur during the breeding season when adults and fledglings are strictly tied to a nest area. Additionally, Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA threshold for causing an owl to flush (USFWS 2012a).

The proposed action would not result in a vegetation type change or a change in habitat classification (size, density, etc.). Considering the character of the anthropogenic conditions of the project area, namely the abundant existing access roads and evidence of former exploration and mining-related disturbance, and the type of activities proposed, including the duration and timing (as described above), the proposed project effects would be negligible and would not substantially alter MSO habitat components or critical habitat (see Figure A.5 in Appendix A). Only existing roads and staging areas would be utilized during the proposed action. No new roads would be created other than up to 0.2 mi of overland routes during the

proposed action. Roads used for the project would be considered for decommissioning after the project has been completed (General Wildlife RPM 1, 2, 10, 14, 22; Botany RPM 3-5; Watershed and Aquatic Resources RPM 3, 5, 6, 9, 11, 19, 21, 23, 25). All proposed surface-disturbing activities are intentionally sited to be co-located where existing roads, historic roads, or historic drill sites have disturbed the soil as a result of previous drilling activities. Minor overland routes on historic tracks and minor earth grading at drill rig stations is proposed at a small number of locations. No nest/roost habitat or habitat components (e.g., large logs, large snags, hardwoods) would be altered by the Project during implementation.

The proposed action would increase human activity in the project area and could disrupt and displace MSO if they are present in the area. However, no impacts would occur to breeding/nesting MSO as drilling activities will not occur during the breeding season. Any MSO remaining in the project area could be impacted by changing behavior and/or flushing from their perches. As stated previously, during implementation, MSO would be able to move to other parts of the forest to avoid prolonged disturbance associated with the drilling/increased human activity. MSO avoiding the area may likely move into another MSO territory and could be threatened by other MSOs protecting their territory. This may cause harm to the individual MSO, but more likely cause competitive exclusion for resources. However, most MSO will altitudinally migrate during winter and impacts from increased human activity would be localized, and wildlife are expected to return to the project area after implementation. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA threshold for causing an owl to flush (USFWS 2012a).

Overall, potential adverse effects would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action. See Appendix B for a list of RPMs for MSO, which are largely derived from the SFNF Forest Plan, which includes MSO Recovery Plan requirements, and includes additional project-specific measures. The RPMs in Appendix B describe project sideboards and plans to protect MSO and habitat, such as maintaining large trees, snags, and downed logs.

A. Designated Critical Habitat

The Primary Constituent Elements (PCEs) essential to the conservation of the MSO include those physical and biological features that support nesting, roosting, and foraging. These are separated into those that meet forest structure requirements and those that meet adequate prey species requirements.

1. PCEs related to forest structure are:
 - a) A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches or more when measured at 4.5 feet from the ground.
 - b) A shade canopy created by the tree branches covering 40 percent or more of the ground.
 - c) Large dead trees with a trunk diameter of at least 12 inches when measured at 4.5 feet from the ground.
2. PCEs related to maintenance of adequate prey species are:
 - a) High volumes of fallen trees and other woody debris.
 - b) A wide range of tree and plant species including hardwoods.
 - c) Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.

3. Primary Constituent Elements related to canyon habitat (one or more of the following):
 - a) Presence of water (often providing cooler air temperature and often higher humidity than the surrounding areas);
 - b) Clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation;
 - c) Canyon walls containing crevices, ledges, or caves; and,
 - d) High percentage of ground litter and woody debris.

The Project does not contain any Canyon Habitat (PCE 3a through 3d), but canyon habitat does exist to the west of the Project near Macho Canyon. Additionally, RPMs for Watershed and Aquatic Resources are in place to avoid impacts to drainages, including those in canyon habitats in the vicinity of the project area. These include RPMs for erosion control measures, refueling, vehicular use, drilling, and drill site reclamation as well as other BMPs for wildlife and aquatic resources (General Wildlife RPM 1, 14, 18; Watershed and Aquatic Resources RPM 7, 9, 10, 11, 13, 14, 21, 22, 24, 25). Project work will not occur within the Canyon Habitat west of the project area, so no impacts will occur to PCEs related to canyon habitats as part of the proposed action.

No impacts to PCEs related to forest structure (PCE 1a through 1c) or maintenance of adequate prey species (PCE 2a through 2c) would occur as part of the projected action. No trees, alive or dead, of sufficient size or age, for MSO nesting or roosting would be cut down for this project (General Wildlife RPM 1, 2, 3, 4, 9, 16; PCE 1a through 1c;). Some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Trees less than 6 inches dbh do not provide nesting or roosting habitat, thus removal of these trees would not alter the availability and function of MSO nest/roost habitat (General Wildlife RPM 1, 2, 3, 4, 9, 16). Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Any downed trees/snags and litter would be left in place to help sustain the PCEs as well as future nesting/roosting habitats (General Wildlife RPM 1, 2, 3, 4, 9, 16; PCE 1c; PCE 2a through 2c). Only safety snags would be cut per RPMs and would be left as downed logs in the project area to help maintain MSO habitat components. Project related work will occur outside of breeding season, and work would not impact designated critical habitat for MSO.

B. Protected Activity Centers and Nest Core Areas

Protected activity centers are designated around recorded owl nest/roost sites and include a minimum of 600 acres. Protected activity centers are where Mexican spotted owls are known to occur per the definition of an owl site (USFWS 2012a). Within protected activity centers, a nest core area is defined as the 100 acres surrounding a nest site or sites within a protected activity center. No impacts to the Indian Creek PAC and nest core areas are expected as no trees, alive or dead, of sufficient size or age, for MSO nesting or roosting would be cut down for this project (General Wildlife RPM 1, 2, 3, 4, 9, 16). Trees planned to be cut or trimmed at the drill sites are less than 6 inches dbh, which do not provide nesting or roosting habitat, thus removal of these trees would not alter the availability and function of MSO nest/roost habitat. Tree cutting and trimming work would be restricted to occur outside of the LOP as detailed previously and in the RPMs (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4).

C. Recovery Habitat

In the project area, Recovery habitat occurs within Mixed Conifer–Frequent Fire Forest. Recovery habitat includes suitable habitat outside of protected habitat that owls use for foraging and dispersing. A subset of recovery habitat is also managed towards nest/roost replacement habitat. Recovery habitat includes mixed conifer forest, pine-oak forest, and riparian areas adjacent to or outside protected areas. These habitat areas are used by resident (i.e., territorial) owls for foraging, since the 600 acres recommended for

protected activity centers include on average 75 percent of nighttime foraging locations of radioed birds (USFWS 2012a). The recovery areas also provide habitat for non-territorial birds (often referred to as “floaters”), to support dispersing juveniles, and to provide replacement nest/roost habitat on the landscape through time. There are 7.72 acres of designated recovery habitat in the project area and 2,351 acres within the analysis area (Table 5.1). Following the Recovery Plan guidelines (USFWS 2012a), any Recovery habitat within, adjacent, or along access routes to the project area will be maintained.

DETERMINATION OF EFFECTS

The proposed project has been analyzed as described above, and the following is the effects determination for MSOs within the project Analysis Area: **May Affect, but Not Likely to Adversely Affect.**

The proposed project has been analyzed as described above, and the following is the effects determination for MSO designated critical habitat within the project Analysis Area: **May Affect, Not Likely to Adversely Affect.**

5.2 Management Indicator Species

Forest Service Manual 2621 – Management Indicators directs the USFS to select management indicator species in the Forest Plan for each forest that best represent the issues, concerns, and opportunities for wildlife on that forest. These selected MIS reflect general habitat conditions needed by other species with similar habitats. The evaluation of each MIS found within this document was tiered from the Land and Resource Management Plan (LRMP) for the SFNF, adopted in 1987, and as amended in 1996 and 2004. The LRMP identified eight MIS: Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*), hairy woodpecker (*Picoides villosus*), mourning dove (*Zenaida macroura*), pinyon jay (*Gymnorhinus cyanocephalus*), Merriam’s wild turkey (*Meleagris gallopavo merriami*), MSO, bighorn sheep (*Ovis canadensis canadensis*), and the Rocky Mountain elk (*Cervus elaphus nelsoni*). The habitat that each MIS represents is presented in Table 5.2. Table 4.6 above identifies the species that are known to occur or have the potential to occur based on the habitat features in the project area. Six MIS have the potential to occur in the project Analysis Area (see Table 4.6). MIS species detections are shown in Figure A.4 in Appendix A. MSO is listed in Table 4.4 and Table 4.5 and evaluated in Section 5.1.

Table 5.2. SFNF Management Indicator Species and Habitat Type

Species	Habitat Type Represented
Rio Grande cutthroat trout	Riparian
Hairy woodpecker	Mature forest and woodland
Mourning dove	Grasslands, woodlands, and ponderosa pine
Pinyon jay	Foraging habitat and mast-producing species in pinyon-juniper
Merriam's wild turkey	Early seral stage habitat in ponderosa pine, which allows for grass, forbs and mast-producing vegetation to grow
Mexican spotted owl	Mature and old growth forest
Rocky Mountain bighorn sheep	Alpine meadows
Rocky Mountain elk	Early seral stage habitat and forage availability

These species were selected as MIS species for reasons described in the SFNF LRMP (USFS 1987, 2012). The objective was to select species that would indicate possible wildlife effects of changing plant communities and associated seral habitats. These species were selected for their association with plant communities or seral stages, which management activities are expected to affect. Other factors considered in the selection of these species were monitoring feasibility, migratory habits, and habitat versatility (LRMP page 96).

The analysis for the proposed project considered the MIS list (USFS 1987, 2012). Of the eight MIS designated in the SFNF Plan EIS, six species—Rio Grande cutthroat trout, mourning dove, hairy woodpecker, Merriam’s turkey, MSO, and Rocky Mountain elk—have some probability of occurring or have suitable habitat within the project area or the Analysis Area. The remaining two MIS were eliminated from evaluation in this document based on lack of habitat within the project area or other criteria (i.e., elevation). The MSO is evaluated in Section 5.1.

5.2.1 *Rio Grande Cutthroat Trout (Oncorhynchus clarki virginalis)*

GENERAL ECOLOGY AND HABITAT

In New Mexico, Rio Grande cutthroat trout exist only in mountain streams in the Sangre de Cristo and Jemez Mountain ranges from the headwaters of the Rio Grande to tributaries in northern New Mexico. The Pecos River and its tributaries were historically occupied by this species. This species feeds opportunistically on aquatic and terrestrial invertebrates, which are mainly found in stream drift. Spawning typically occurs from the middle of May to the middle of June. Sediment-free depositional gravel beds that have a continuous flow of well-oxygenated water are required for successful development of embryos. Suitable gravels range from 6 to 40 mm in diameter (Harig and Fausch 1999; Magee et al. 1996). Juveniles need shallow, calm water that is protected from the elements provided by side channels, undercut banks and overhanging vegetation or exposed roots along margins. Adults need pools with residual depth greater than 1 foot in order to survive harsh winter conditions (Harig and Fausch 2000). According to the SFNF, Rio Grande cutthroat trout are known to occur within tributaries of the Pecos River within 2 miles downstream of the project area (see Figure A.4 in Appendix A). The nearest streams capable of supporting Rio Grande cutthroat trout are approximately 1,638 feet to the northeast of the project area and 3,175 feet south of the project area, respectively. During the biological survey, the streams in the project area were identified as intermittent and do not meet the requirements to support Rio Grande cutthroat trout. These streams are all associated with seeps and springs within the project area.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment may disrupt and displace Rio Grande cutthroat trout during implementation. However, there are no streams within the drilling area that can support Rio Grande cutthroat trout. Streams that support Rio Grande Cutthroat Trout exist downstream of the drilling area and also would be crossed along the access route to the drilling area. Drilling activities are not expected to negatively impact any streams in the Analysis Area or beyond that can support Rio Grande cutthroat trout because of the project RPMs for aquatic species and aquatic management zones to protect these habitats (see Appendix B for RPMs for Watershed and Aquatic Resources). The proposed action would avoid any activities in springs, wetlands, or riparian areas, thus avoiding impacts, such as impaired water quality from sedimentation and erosion to the Rio Grande cutthroat trout individuals and habitat downstream of the project area (Watershed and Aquatic Resources RPM 2, 5, 8, 9, 10, 11, 14, 16, 18, 19, 21, 22, 24, 26).

Erosion control measures would be implemented to effectively stabilize the area using grading to control water flow, water bars, and revegetation or other ground cover (Watershed and Aquatic Resources RPM 2, 5, 8, 9, 10, 11, 14, 16, 18, 19, 21, 22, 24, 26). Equipment would also come equipped with outriggers to help level the rig at the drill site, thereby minimizing ground leveling required. If any proposed drill site surface grading or minor excavation occurs, the displaced material would be stockpiled and enclosed behind a barrier to minimize potential stormwater runoff interaction with the displaced materials (Watershed and Aquatic Resources RPM 2, 5, 8, 9, 10, 11, 14, 16, 18, 19, 21, 22, 24, 26). Proposed mud pits lined with 6 mil thick plastic would be used to allow for drill mud circulation. Mud pits would also be bound and covered with fencing and netting, and designed with a ramp for egress in the event an animal or human enters the pit (General Wildlife RPM 11; Watershed and Aquatic Resources RPM 2). Drilling would use water from the on-site well, and no dewatering of streams or springs would occur as part of the proposed action. At the end of the proposed activity, mud pits would be filled and recontoured, removed topsoil would be replaced, and an approved seed mix would be planted, crest-only waterbars would be maintained, and, if an overland route, the access would be blocked using a non-drivable waterbar (Botany RPM 8; Watershed and Aquatic Resources RPM 24, 25).

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the Rio Grande cutthroat trout.

5.2.2 Mourning Dove (*Zenaida macroura*)

GENERAL ECOLOGY AND HABITAT

The mourning dove occupies a variety of habitat types including desert riparian deciduous woodland, marshes, annual grassland, Madrean evergreen woodland, and Chihuahuan desertscrub (USDA 1991). In New Mexico, they are commonly found in mesic woodland habitats characterized by salt-cedar and Russian olive (Baltosser 1991). They can be found in Douglas-fir, ponderosa pine, and pinyon-juniper and nest from lowlands up into pine forests. They are casually found at higher elevations between 7,000 and 13,000 feet (Hubbard 1978). Mourning doves utilize a variety of coniferous and deciduous tree and shrub species for nesting, preferring coniferous trees early in the year before deciduous trees have developed leaves (Tomlinson et al. 1994). Nests are flimsily built and are usually placed in trees or shrubs, but sometimes on the ground (Tomlinson et al. 1994). Fires may affect nesting by destroying nest trees, which may increase the occurrence of ground nesting. The diet of the mourning dove consists primarily of seeds from cultivated grains, wild grasses, weeds, herbs, and berries. Mourning doves feed on the ground, where they peck and push aside litter to expose small seeds (Cornell Lab of Ornithology 2015). Foxtails (*Setaria* spp.) and ragweed (*Ambrosia* spp.) are two preferred food plants (Tomlinson et al. 1994).

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would not occur during the breeding season and therefore would not impact nesting or breeding activity. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace mourning doves during implementation. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing

noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA). Project activities would occur outside of the breeding season and therefore would not impact nesting or breeding activity. Furthermore, the LOP for MSO would be in effect from March 1 through August 31 and would benefit the mourning dove within the vicinity of the project area (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS. During implementation, mourning doves may be able to move to other parts of the forest to avoid disturbance associated with the drilling.

Mourning dove are found in a variety of habitats, but they infrequently breed above 7,000 feet (Hubbard 1978). Therefore, project-related activities would not disturb the species during the breeding season and would not remove or degrade nesting habitat for this species (General Wildlife RPM 1, 2, 3, 4, 9, 16). Mature forest trees and snags would not be affected by the drilling activities, and any snags or other downed woody debris would be left intact and on-site (General Wildlife RPM 1, 2, 3, 4, 9, 16). Foraging and nesting habitats would not be affected by the drilling activities, and no mature trees would be cut as part of the proposed action. However, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. Overall, the potential impacts would be mitigated through the application of the RPMs (see Appendix B) to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the mourning dove.

5.2.3 *Hairy Woodpecker (Picoides villosus)*

GENERAL ECOLOGY AND HABITAT

Hairy woodpeckers serve as a management indicator for mature forest and woodland habitats (i.e., ponderosa pine, mixed conifer, spruce-fir, aspen, and oak woodland). They are also found in mature pinyon-juniper, but typically, pinyon trees are not large enough to provide suitable snags for nesting. The species can be found equally commonly in coniferous forests, deciduous forests, or mixtures, and generally up to approximately 6,500 feet in elevation (Cornell Lab of Ornithology 2015; BISON-M 2019). They are primarily insectivorous and feed on insects associated with snags and down logs. The species is also strongly associated with burned areas, an important historical component of forests resulting from a frequent fire interval. Hairy woodpeckers prefer aspen forest for nesting and foraging, and snags and down logs are key components of hairy woodpecker habitat. Hairy woodpecker habitat quality is expected to increase over time as young stands of forest mature. Activities that reduce the older tree component typically reduce habitat capability. Activities or events that create snag habitat or that

move forest areas to later seral stages benefit hairy woodpeckers. The species is a forest generalist, keying in on available snags and live aspen.

Snags most often used for cavity nesting by hairy woodpeckers are 15 or more inches dbh and, the species is more often in soft snags than hard (BISON-M 2019). Down logs are also important to support insect populations for foraging. Removal of large snags, future snags, and down logs increases the probability of decreased population numbers of hairy woodpeckers.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would not occur during the breeding season and therefore would not impact nesting or breeding activity. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace hairy woodpeckers during implementation. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. Project activities would occur outside of the breeding season and therefore would not impact nesting or breeding activity. Furthermore, the LOP for MSO would be in effect from March 1 through August 31 and would benefit the hairy woodpecker within the vicinity of the project area (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS. During implementation, hairy woodpeckers may be able to move to other parts of the forest to avoid disturbance associated with the drilling.

Hairy woodpeckers are sensitive to noise disturbance near nest sites during the breeding season but are also aggressive defending the area around the nest. However, project-related activities would not disturb the species during the breeding season and would not remove or degrade nesting habitat for this species (General Wildlife RPM 1, 2, 3, 4, 9, 16). Mature forest trees and snags would not be affected by the drilling activities, and any snags or other downed woody debris would be left intact and on-site site (General Wildlife RPM 1, 2, 3, 4, 9, 16). Foraging and nesting habitats would not be affected by the drilling activities, and no mature trees would be cut as part of the proposed action. However, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the hairy woodpecker.

5.2.4 Merriam's Wild Turkey (*Meleagris gallopavo merriami*)

GENERAL ECOLOGY AND HABITAT

Merriam's wild turkey is common throughout the project area and uses a variety of forest or woodland habitat types. The primary habitat for this species includes forest and open woodland, scrub oak, deciduous, mixed deciduous-coniferous areas, hardwood forests/woodlands, cropland/hedgerow, and shrubland/chaparral. Merriam's wild turkey is known to occur from 6,000 to 12,000 feet in elevation and usually nests on the ground in shade and on north-facing slopes in coniferous forests between 7,000 and 9,500 feet in elevation. Merriam's wild turkey prefers mesic (moderately moist) summer and brood habitat that is relatively open with a variety of grasses and forbs (NMDGF 2013). The principal mast crops on which the Merriam's wild turkey is largely dependent in winter and early spring, listed in order of importance, are acorns, pinyon nuts, alligator-bark juniper (*Juniperus deppeana*) berries, and other nuts. Tall, dense spruce and other conifers are an important element of turkey-nesting habitat in high country in that they furnish shelter for hens and young during frequent rain or sleet squalls after the rainy season begins (BISON-M 2019). Breeding season is typically from mid-February through late May.

Merriam's wild turkey is an indigenous subspecies inhabiting the ponderosa pine forests of the mountainous regions of the western United States. In New Mexico, there is a strong population of Merriam's wild turkey, and populations are rated as secure in the state (NatureServe 2019). Current populations of Merriam's wild turkey are found throughout forests in New Mexico, with state-wide populations of approximately 35,000 to 40,000. They are found on the Pecos-Las Vegas Ranger District and Santa Fe National Forest, and the entire proposed project area is commonly used year-round by turkeys. The project area provides adequate nesting, roosting, and foraging habitat as evidenced by occurrence of turkeys.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would occur during the beginning of the breeding season and therefore may impact nesting and breeding activity. Drilling activities, noise, vibrations, and the presence of increased human activity and equipment could present noise and visual disturbances that could disrupt and displace Merriam's wild turkey if they are present in the area during implementation. These activities may result in changing behavior and/or flushing from their shelter or nesting habitats. These activities may also increase vulnerability to predators and thermal regulation considering cold and wet conditions. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation. Movement of machinery used to conduct drilling operations might disturb nests found at the bases of trees or concealed by understory, but this is highly unlikely along roads where the drill sites would be positioned. Increased noise from drilling might disturb flocks and cause them to leave the area. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. Project activities would occur during the beginning of the breeding season and therefore may impact

nesting and breeding activity. However, the LOP for MSO would be in effect from March 1 through August 31 and would benefit Merriam's wild turkey within the vicinity of the project area (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS. During implementation, Merriam's wild turkeys would be able to move to other parts of the forest to avoid disturbance associated with the drilling.

Merriam's wild turkeys are sensitive to noise disturbance near nest sites during the breeding season. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below 69 dBA. However, project-related activities would not remove or degrade nesting habitat for this species. Foraging, cover, and nesting habitats would not be affected by the drilling activities, and no mature trees would be cut as part of the proposed action. However, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. After drilling, the sites would revegetate over time and possibly through reseedling, which would allow for the establishment of early successional vegetation such as grasses, forbs, and shrubs. Some of the vegetation (such as oak and grasses) that would be removed could provide forage for turkey, however, this vegetation would still remain in sufficient quantities in the project analysis area and surrounding areas to continue to provide forage opportunities, and would revegetate in the project sites after the project's completion. Drilling activities may affect individuals of Merriam's wild turkey but would not likely impact forest-wide population trends. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for Merriam's wild turkey.

5.2.5 Rocky Mountain Elk (*Cervus elaphus nelsoni*)

GENERAL ECOLOGY AND HABITAT

This species is an indicator species for open, mixed conifer habitat with a mountain meadow component. The project area is considered suitable habitat for elk to use year-round with use dependent on the amount and timing of snowfall. Seasonal movement often occurs along the drainages during spring and fall. Elk tend to use the higher elevations to cool off during the hotter spring and summer months. Elk calving takes place in the spring, usually between May or June when adults are migrating to higher elevations for the summer. The breeding usually occurs in September, although it has been recorded as early as late August and as late as early November. In general, elk prefer open, grassy meadows located less than 0.5 mile from water. Hiding cover for elk occurs in stands of trees 30 to 60 acres in size with 70% canopy cover. Elk also use oak and locust for hiding cover in areas that have had stand-replacing wildfire

(USFS 2017). New Mexico's elk populations have fluctuated dramatically over the past 100 years. Populations bottomed out around the turn of the century, and then rebounded as logging, grazing, and burning activities opened up more areas. Population data from the elk harvest report in the Pecos Herd Unit (Game Management Unit 45) are estimated from 1,100 to 1,800 elk within the unit (NMDGF 2018).

Cover-to-forage ratios are widely used as an index of elk habitat quality. Prime elk habitat has been estimated to consist of a mix of approximately 40% tree cover and 60% forage openings, a 40:60 ratio (Hoover and Willis 1984). Patches of multistoried, closed-canopy forest provide quality thermal cover for elk during hot summers and cold winters (Hoover and Willis 1984). Although elk require cover for protection against heat and extreme cold, ideal forests have meadow habitat interspersed with forest cover, with large amounts of edge (Skovlin 1982). Compared with desired cover-to-forage ratios, the project area currently contains an overabundance of forest cover (hiding and thermal cover) and a shortage of openings filled with grass, forb, and shrub species. Historic meadows and oak groves are nearly all covered with conifer trees. Hiding and thermal cover are abundant due to the very large numbers of small seedlings, saplings, young, and mid-age trees. Stand density is highest in the moist, mixed-conifer forest patches on north- and east-facing slopes and in drainage bottoms, where elk can cool off during the summer.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would occur during the breeding season and drilling activities, noise, vibrations, and the presence of increased human activity and equipment could present noise and visual disturbances that could disrupt and displace Rocky Mountain elk if they are present in the area during implementation. These activities may result in changing behavior and/or affecting seasonal movement for breeding and calving. Although hiding cover would not be impacted, Rocky Mountain elk may be disrupted and displaced from their hiding cover during implementation. These activities may also increase vulnerability to predators. Drilling activities are not expected to negatively impact elk foraging, cover, bedding, or calving habitats because elk could likely move to other parts of the SFNF to avoid disturbance associated with the drilling. Impacts would be localized, and wildlife are expected to return to the project area after implementation. Breeding activity could be disrupted and displace elk during implementation in the project area as drilling activities are scheduled to occur in the fall and winter, which is the rutting/breeding season for elk. However, these impacts would be localized, and elk would likely move to other parts of the SFNF for breeding to avoid disturbance associated with the drilling. Depending on weather, elk may be at lower elevations during drilling. Drilling would not occur during calving season, which coincides with the MSO breeding season. Furthermore, the LOP for MSO would be in effect from March 1 through August 31 and would benefit Rocky Mountain elk within the vicinity of the project area during the calving season (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS.

Movement of machinery used to conduct drilling operations might also disturb individuals or herds in the vicinity of the project area, and the increased noise from drilling would likely cause them to move to other parts of the SFNF. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. Under the proposed action, suitable habitat of elk (open, mixed conifer habitat with a mountain meadow component) would be maintained and not impacted. Mature forest trees would not be affected by the

drilling activities, but removal of some small coniferous trees (seedlings/saplings) less than 6 inches dbh may be cut or trimmed at the drill sites to accommodate equipment, which could help promote elk foraging habitat. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action.

Drilling activities may affect individuals or herds of Rocky Mountain elk but would not likely impact forest-wide population trends. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the Rocky Mountain elk.

5.3 Regional Forester Sensitive Species

The USFS's sensitive species program is designed to help maintain biodiversity and viable populations of species in accordance with National Forest Management Act regulations (36 Code of Federal Regulations 219.19). The goal in managing sensitive species habitat is to prevent a trend toward listing under the ESA. Sensitive species to be considered in land management planning activities are those designated by the Regional Forester (Forest Service Manual 2670.5). In September 2012, the Regional Forester approved a revised list of sensitive species for the Southwestern Region (USFS 2013).

The wildlife biologist for the SFNF reviewed the 2013 lists of sensitive species to determine which species would occur or have suitable habitat in the project area. Table 4.5 above identifies the species that are known to occur or have the potential to occur based on the habitat features in the project area. Nine Regional Forester sensitive species have the potential to occur in the project area. Regional Forester sensitive species detections are shown in Figure A.4 in Appendix A.

5.3.1 Pecos Mariposa Lily (*Calochortus gunnisonii* var. *perpulcher*)

GENERAL ECOLOGY AND HABITAT

This is a rare color form of a more common species. It is found only in the eastern part of the Pecos Wilderness. It grows in meadows and aspen glades in upper montane coniferous forest between 9,500 and 11,200 feet in elevation. Flowers late July and August. A historic population of Pecos Mariposa Lily was known on Hermit's Peak but attempts to relocate the species have been unsuccessful (New Mexico Rare Plant Technical Council 1999). The Pecos Mariposa Lily is suspected to only occur on the Pecos—Las Vegas Ranger District. Several aspen groves are present near the project area, but no Pecos mariposa lilies were observed during field surveys.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would not result in the loss of Pecos Mariposa Lily or suitable habitat. The proposed action would not occur during the flowering season. Meadows and aspen glade habitats that could be occupied by the species do not occur in the project area, and these habitats would not be impacted by the proposed action. If the species happens to be present, machinery and equipment activities may cause direct mortality by crushing individual plants (Botany RPM 1-10). However, there are no meadows or aspen glades within the project area, and such areas adjacent to the project area would be identified (e.g., flagged) and avoided by machinery, vehicles, and equipment (Botany RPM 6). The project is at or below the lower extent of the species geographic range and known elevational requirements, so it is unlikely to occur in the project area. In addition, the RPMs described in Appendix B would be used to prevent the introduction and to control of noxious weeds during the proposed action (Botany RPM 1-4, 7, 9). Additionally, if Pecos Mariposa Lily is later discovered in the project area, appropriate mitigations would occur, such as flagging and avoidance (Botany RPM 6). All machinery, vehicles, and equipment would be weed free prior to entering the project area and would staged/parked in weed-free areas (Botany RPM 1-4).

It is highly unlikely that Pecos Mariposa Lily would be impacted by the proposed action because no meadows or aspen glade habitat occur in the project area. Overall, the potential impacts listed above would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (Botany RPM 1-10). The proposed activities may affect this species, if it happens to be present, but those activities would not be expected to lead to a decline toward listing. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the Pecos Mariposa Lily.

5.3.2 ***Yellow Lady's-Slipper [Cypripedium parviflorum var. pubescens (=C. calceolus var. pubescens, C. pubescens)]***

GENERAL ECOLOGY AND HABITAT

Common in the northern and eastern U.S., Yellow Lady's-Slipper reaches the southwestern extent of its range in Arizona and New Mexico. It is relatively common in northern New Mexico, but populations are small and scattered. This species requires moderate shade to nearly full sun in fir, pine, and aspen forests from 6,000 to 9,500 feet in elevation. It most often grows just above the banks of streams, usually 150 to 300 feet from water. This species grows on mesic slopes up to 60 degrees, facing east to northeast and covered with lush growth less than a foot tall. It is often associated with blue berries (*Vaccinium* spp.), shooting stars (*Dodecatheon* spp.), and several species of daisies. *Lilium* spp. is often found in the same area (Coleman 2002). Yellow Lady's-Slipper habitat also includes dripping seeps on steep to moderate sloped canyon walls where the soil is saturated (Coleman 2002). The seeps are surrounded by pine and fir, but the plants are in full sun much of the day. An 8- to 16-inch perennial deciduous forb that grows as a single plant or in a colony; roots are rhizomatous (Coleman 2002; Mergen 2006). The large flower is a bright yellow pouch that blooms as early as the last week in May and is over by the first week in July (Coleman 2002). Yellow Lady's-Slipper is most often found on or confined to predominately calcareous

soils (Mergen 2006). Yellow Lady's-Slipper is known to occur in the Pecos Wilderness, with the closest known populations along Forest Road 123A between Macho and Dalton Canyons (approximately 3 miles away from the project area) and in upper Holy Ghost Canyon (approximately 3.5 miles away from the project area). This species was not observed, living or dead, in the project area during the biological survey, which was conducted during its flowering season, although suitable habitat is present in the project area.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. The proposed action would occur during the flowering season. This species grows on mesic slopes up to 60 degrees and in areas with dripping seeps on steep to moderate sloped canyon walls and these habitats do not occur within the project area. Any habitats in the vicinity of the project area containing these features would be identified (e.g., flagged) and avoided by machinery, vehicles, and equipment. Machinery and equipment activities may cause direct mortality by crushing individual plants (Botany RPM 1-10). Indirect impacts may occur from compaction of soils, which could reduce sprouting and increase erosion in habitat. However, habitats that could be occupied by the species are limited in the vicinity of the project area, and these habitats would not be impacted by the proposed action. In addition, the RPMs described in Appendix B would be used to prevent the introduction and to control of noxious weeds during the proposed action (Botany RPM 1-4, 7, 9). Additionally, if Yellow Lady's-Slipper is later discovered in the project area, appropriate mitigations would occur, such as flagging and avoidance (Botany RPM 6). All machinery, vehicles, and equipment would be weed free prior to entering the project area and would staged/parked in weed-free areas (Botany RPM 1-4).

It is highly unlikely that Yellow Lady's-Slipper would be impacted by the proposed action because no drilling activities would occur within or adjacent to any riparian areas. Overall, the potential impacts listed above would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (Botany RPM 1-10). The proposed activities may affect this species, if it happens to be present, but those activities would not be expected to lead to a decline toward listing. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the Yellow Lady's-Slipper.

5.3.3 *Robust Larkspur (Delphinium robustum)*

GENERAL ECOLOGY AND HABITAT

This plant grows in canyon bottoms and aspen groves in lower and upper montane coniferous forests from approximately 7,200 to 11,200 feet in elevation. Flowers from July to September. No specimens from Rio Arriba or Sandoval Counties are held at the UNM Herbarium, but Warnock (1997) in *Flora of North America* identifies this plant as occurring in the San Pedro and Jemez Mountains, which would include the Cuba and Jemez Ranger Districts in the SFNF. Six occurrences have been reported in New Mexico, three of which were on the Carson National Forest (Seinet 2019). According to the SFNF LRMP, the current status of the species is unknown because there are no known populations in the SFNF (USFS 2019).

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would not result in the loss of Robust Larkspur or suitable habitat. The proposed action would occur during the flowering season. Canyon bottoms and aspen grove habitats that could be occupied by the species do not occur in the project area, and these habitats would not be impacted by the proposed action. If the species happens to be present, machinery and equipment activities may cause direct mortality by crushing individual plants (Botany RPM 1-10). However, there are no canyon bottoms or aspen groves within the project area, and such areas adjacent to the project area would be identified (e.g., flagged) and avoided by machinery, vehicles, and equipment (Botany RPM 6). Indirect impacts may occur from compaction of soils, which could reduce sprouting and increase erosion in the habitat. Aspen grove habitats that could be occupied by the species do not occur in the project area, and these habitats would not be impacted by the proposed action. In addition, the RPMs described in Appendix B would be used to prevent the introduction and control of noxious weeds during the proposed action (Botany RPM 1-4, 7, 9). All machinery, vehicles, and equipment would be weed free prior to entering the project area and would staged/parked in weed-free areas (Botany RPM 1-4). Additionally, if Robust Larkspur is later discovered in the project area, appropriate mitigations would occur, such as flagging and avoidance (Botany RPM 6).

It is highly unlikely that Robust Larkspur would be impacted by the proposed action because no canyon bottoms or aspen grove habitats occur in the project area. Overall, the potential impacts listed above would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (Botany RPM 1-10). The proposed activities may affect this species, if it happens to be present, but those activities would not be expected to lead to a decline toward listing. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the Robust Larkspur.

5.3.4 *Wood Lily (Lilium philadelphicum)*

GENERAL ECOLOGY AND HABITAT

This species has only limited populations in New Mexico. These populations occur in the understory of open mixed-conifer forests in areas where soils are humus, rich, and well-drained as well as out of direct sunlight between 7,600 and 8,260 feet in elevation. This species is also found in wooded sites in foothills in montane-subalpine habitats as well as in moist, wooded areas under aspen stands or bordering ponds. It flowers from mid-June to early August. This species has a broad range and is not considered a rare species, though its distribution in New Mexico is perhaps uncommon and patchy (NMRPTC 1999). Wood lily is known to occur in the Pecos Wilderness, with the closest known populations along Forest Road 123A between Macho and Dalton Canyons (approximately 3 miles away from the project area) and in upper Holy Ghost Canyon. This species was not observed, living or dead, in the project area during the biological survey, which was conducted during its flowering season, although suitable habitat is present in the project area.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would not result in the loss of Wood Lily or suitable habitat. The proposed action would not occur during the flowering season. Although suitable woodland habitats exist in the project area, the project area is well above the upper extent of the known elevational requirements of the species, so it is unlikely to occur in the project area. The species was not observed, living or dead, in the project area during the biological survey, although suitable habitat is present in the project area. However, if the species happens to be present, machinery and equipment activities may cause direct mortality by crushing individual plants (Botany RPM 1-10). Indirect impacts may occur from compaction of soils, which could reduce sprouting and increase erosion in the habitat. However, any habitats that could support this species within the project area and adjacent to the project area would be identified (e.g., flagged) and avoided by machinery, vehicles, and equipment to the extent possible (Botany RPM 6). In addition, the RPMs described in Appendix B would be used to prevent the introduction and to control of noxious weeds during the proposed action (Botany RPM 1-4, 7, 9). If Wood Lily is later discovered in the project area, appropriate mitigations would occur, such as flagging and avoidance (Botany RPM 6).

Overall, the potential impacts listed above would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (Botany RPM 1-10). The proposed activities may affect this species, if it happens to be present, but those activities would not be expected to lead to a decline toward listing. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for Wood Lily.

5.3.5 Northern Goshawk (*Accipiter gentilis atricapillus*)

GENERAL ECOLOGY AND HABITAT

Preferred habitat for the NOGO consists of coniferous forests with a variety of structural stages for nesting and foraging. Forest types occupied by the NOGO in the southwest are ponderosa pine, mixed conifer species, and spruce-fir (Reynolds et al. 1992). Typically, these forested areas require moderate space between trees for foraging and canopy cover generally over 40%. Nesting areas usually have a higher canopy cover. Nests typically occur in mature to old-growth forests composed primarily of large trees, with high canopy closure, near the bottom of moderate hill slopes, with sparse ground cover (Squires and Reynolds 1997; Squires and Kennedy 2006). The nest site is generally situated within 0.25 mile of a stream or other water source (Squires and Reynolds 1997). Northern goshawks prey on small to medium-sized birds and mammals from robins and chipmunks to grouse and rabbits (Reynolds et al. 1992). The best foraging habitat occurs in a mosaic of structural stages scattered across the landscape (Reynolds et al. 1992). In New Mexico, average home range size during the breeding season includes 1,400 acres for females and 5,200 acres for males (Squires and Reynolds 1997).

Northern goshawk protocol broadcast and intensive search surveys were completed by SWCA in 2019 in the project area. No NOGO detections were observed at Jones Hill, but during the Jones Hill surveys one NOGO detection was observed at the southeast corner of Macho Canyon (see Figure A.3 in Appendix A for NOGO detections).

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace NOGOs during implementation. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. Project activities would occur outside of the breeding season and therefore would not impact nesting or breeding activity. Furthermore, the LOP for MSO and NOGO would be in effect from March 1 through August 31 and would benefit NOGOs within the vicinity of the project area (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS. During implementation, NOGOs would be able to move to other parts of the forest to avoid disturbance associated with the drilling.

Northern goshawks are sensitive to noise disturbance near nest sites during the breeding season but are also aggressive defending the area around the nest. However, project-related activities would not occur during the breeding season and would not remove or degrade nesting habitat for this species (General Wildlife RPM 1, 2, 3, 4, 9, 16). Mature trees, canopy closure, and snags would not be affected by the drilling activities, and any snags or other downed woody debris would be left intact and on-site. Some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment (General Wildlife RPM 1, 2, 3, 4, 9, 16). Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Areas immediately along Forest Roads would likely not be the preferred location for NOGO nesting due to a slightly higher level of human presence. It is expected that less than 3% of these trees to be removed are over 5 inches dbh, and no trees would be removed that are over 6 inches dbh. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. Overall, the potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for NOGO.

5.3.6 *Northern Leopard Frog (Lithobates pipiens)*

GENERAL ECOLOGY AND HABITAT

The northern leopard frog ranges in a variety of habitats (springs, marshes, wet meadows, riparian areas, vegetated irrigation canals, ponds, and reservoirs) but requires a high degree of vegetative cover for

concealment (BISON-M 2019). In New Mexico they are known from approximately 3,600 to 10,000 feet and breed in ponds or lake edges with fairly, dense aquatic emergent vegetation from April-July and again from September-October (Degenhardt et al. 1996). They attach their eggs to submerged vegetation well below the surface, in water 0.5 meter deep or more (BISON-M 2019). Northern leopard frogs can disperse and move across relatively large distances among these different habitats, commonly moving 800 meters, with reported ranges up to 5 kilometers (Dole 1971; Knutson et al. 2018). This riparian species requires well-oxygenated springs, slow streams, or other perennial, large lakes and streams as habitat for overwintering hibernation, which do not freeze completely during winter (BISON-M 2019; Cunjak 1986; Emery et al. 1972; Mushet 2010). During warmer months they may be found in wet meadows or other habitats near standing water and these habitats are limited on the SFNF. The northern leopard frog has been documented on the Cuba, Jemez, Española, and Pecos–Las Vegas Ranger Districts. Ongoing threats include degradation of habitat caused by grazing, chytrid fungus, or siltation due to uncharacteristic wildlife and poor road management.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace northern leopard frog during implementation. The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA.

Any riparian areas (streams, drainages, ponds, or other standing water) within and adjacent to the project area would be identified and avoided by machinery, vehicles, and equipment. Comexico will also incorporate BMPs such as installing sediment and stormwater controls before initiating surface-disturbing activities. This includes earthen berms around the perimeter of each drill site to collect any water and precipitation falling on the drill rig and drill site and direct it to the mud pit. Additionally, these BMPs would also prevent water or drilling effluent to flow uncontrolled from mud pits. Comexico would also install erosion-control devices to stabilize recently disturbed sites and control sediment transport, as needed, which could include matting, geotextile, hydro mulch, or dry straw mulch, and use silt fences, certified weed-free straw bales, or sumps as approved with each phase of the Project (Watershed and Aquatic Resources RPM 2, 5, 8, 9, 10, 11, 14, 16, 18, 19, 21, 22, 24, 26).

Riparian habitats that could be occupied by the species are limited in the project area and these habitats would not be impacted by the proposed action (Watershed and Aquatic Resources RPM 2, 5, 8, 9, 10, 11, 14, 16, 18, 19, 21, 22, 24, 26). During spring and summer, the riparian and wet areas in the project area provide transitory, dispersal habitat for frogs. However, some of the ponds likely dry out at different times during the year. One of these ponds (near the staging area) was identified (audible calling) to contain northern leopard frogs during MSO surveys in early June 2019, but on subsequent visits the pond was observed to be dry. During field surveys, the ponds and stock tanks in the project area were observed to be less than 6 inches deep. Machinery and equipment activities could cause direct mortality of individual frogs during dispersal during warmer times of the year. However, the proposed drilling activities during winter times would limit the direct impacts to northern leopard frogs because the species would likely be hibernating. Frogs typically go into a state of hibernation during winter and would very likely not be on the ground surface during drilling activities (October to February). Average high and low temperatures during winter for Pecos, New Mexico, (6,934 feet in elevation) are approximately 53.95°F and 21.85°F, respectively (Western Regional Climate Center 2016).

Thus, it is possible that individual frogs would be dispersing between water sources in the project area and could be impacted by equipment during drilling activities. However, these impacts would be limited to the warmer time periods of the year when frogs are active and on the ground surface. Any impacts from drilling activities, noise, vibrations, or the presence of humans and equipment would be localized, and wildlife are expected to return to the project area after implementation. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the northern leopard frog.

5.3.7 *Pale Townsend's Big-Eared Bat (Corynorhinus townsendii pallescens)*

GENERAL ECOLOGY AND HABITAT

The pale Townsend's big-eared bat is frequently associated with caves and abandoned mines in desert scrub, woodlands, and coniferous forests for day roosts and hibernacula but also uses abandoned buildings and crevices on rock cliffs for refuge. The mixed conifer, ponderosa pine forest, and pinyon-juniper woodland habitats that occur in the project area may serve as roosting habitat for the species, as well as any abandoned buildings in the project vicinity. Daytime roosts are principally mine tunnels and caves and occasionally cliffs, cracks, crevices, and trees that must have cave-like spaces, whereas nighttime roosts are often buildings or bridges. Pale Townsend's big-eared bat forages along edge habitats (e.g., forested edges and intermittent streams), in forested habitat, along heavily vegetated stream corridors, and in open areas near wooded habitat, though they appear to avoid open, grazed pastureland (Pierson et al. 1999). Water sources required for drinking generally must be open and accessible. Pale Townsend's big-eared bats are relatively sedentary; they do not move long distances from hibernacula to summer roosts, nor do they move or forage far from their day roosts. Cattle ponds and meadow grasslands may provide foraging habitat for some individual species. This species specializes in eating moths and other insects such as beetles, flies, and wasps. Pale Townsend's big-eared bat is usually a late flier and will forage along the edge of vegetation. For hibernation, this species prefers roost sites where the temperature is 54°F or less. Pesticide spraying, conversion of native shrub-steppe to grasslands, reduction and conversion of riparian habitats as a result of livestock grazing, and timber harvest have all been implicated with a general downward trend of foraging habitat for pale Townsend's big-eared bat (Pierson et al. 1999). This species is not known to occur on the SFNF.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace bats during implementation, specifically when they come out of roosting to forage. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation following RPMs (General Wildlife RPM 1-24). The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment

(NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. If pale Townsend's big-eared bats are present, project activities and actions may adversely impact individuals because this project is likely to be actively worked on up to 22 hours per day, even though this is a nocturnal species. Project activities may cause roost abandonment, but Pale Townsend's big-eared bats may be able to move to other parts of the forest to avoid disturbance associated with the drilling prior to hibernation. No potential roosting/reproductive habitat would be altered by the project (General Wildlife RPM 1, 2, 3, 4, 9, 16). The project area would not be affected to such an extent that it would be unusable as foraging habitat by the species in the long term. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (General Wildlife RPM 5-8).

Because adits and shafts in the project area would not be impacted, the proposed action would not directly impact roosts for pale Townsend's big-eared bats. Any individuals present within mine adits or shafts in the project area may be disturbed by noise and vibration impacts and may relocate temporarily prior to hibernation (General Wildlife RPM 4-8). However, during winter, hibernating bats may be awaked with reduced energy supplies to the point where survival of the individual may not be possible. Pale Townsend's big-eared bats present in the project area could experience impacts from noise, vibration, artificial night lighting, and increased human traffic. Any bats roosting near the project area could abandon roost sites during project activities, and any breeding and foraging activities could be disrupted from during project activities. Project activities would be avoided to the extent possible within close proximity of an active bat roost and personnel should avoid mine adits or shafts, especially during the evening exodus from day roosts (General Wildlife RPM 4-8). Combustion equipment, such as generators, pumps, and vehicles, should not be parked or operated immediately adjacent to the mine adit or shaft (General Wildlife RPM 4-8). Impacts on pale Townsend's big-eared bats could also result from prey species experiencing the same impacts as the pale Townsend's big-eared bats, hence altering their predator-prey relationships. Light may attract insects and increase the density of forage for some insectivorous bat species prior to bats hibernating (Bennie et al. 2016). Bat species would experience impacts from avoiding foraging habitat due to noise and vibration from drilling activities prior to hibernation (Siemers and Schaub 2011). Conversely, there is the potential that increased artificial night lighting may be beneficial to some bat species, for at least some aspects of their natural history (Fenton and Morris 1976). In addition, artificial light may increase moth (order Lepidoptera) predation by bats and birds (Frank 2006). To the extent possible Project activities would incorporate dark sky-compliant lighting into operations across the entire Project to minimize glare, light trespass, and skyglow concerning bat protection. This includes shading exterior construction lighting for downward display to the extent possible for safety, to prevent lights from being viewed beyond the work area and upwards affecting the night sky (General Wildlife RPM 8). There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for Townsend's pale big-eared bat.

5.3.8 Spotted Bat (*Euderma maculatum*)

GENERAL ECOLOGY AND HABITAT

In New Mexico, spotted bats have been documented from numerous localities throughout the western two-thirds of the state between 3,900 and 10,600 feet in elevation in a variety of habitats, including riparian communities, pinyon-juniper woodlands, and ponderosa pine and spruce-fir forests, and in burned areas of ponderosa pine forest (NMDGF 2018). Spotted bats are thought to be residents in

ponderosa pine forests in June and July and wander to lower elevations in late summer and autumn. However, most New Mexico records of spotted bats are from warmer months (April–September). In the SFNF, individuals have been recorded on the northwest, southwest, and southeast local zones and are known to use cliff faces and rock crevices [within all terrestrial Ecological Response Units (ERUs)] to roost in, which are limited in the area. The potential for contracting white-nose syndrome, a lethal fungal infection found in some species of hibernating bats in the eastern and mid-western United States, is low because the spotted bat is not known to hibernate in groups. Though this bat is associated with multiple ERUs, their preferred habitat is sub-alpine coniferous forests, which tend to be moderately to highly departed. The bat shows apparent seasonal change in habitat, occupying ponderosa pine woodlands in the reproductive season and lower elevations at other times of the year (BISON-M 2019). This bat feeds on noctuid moths in and over the forest canopy but will sometimes prey on June beetles and grasshoppers. The main threats to the species are habitat alteration, wildland fires, over collection, toxic chemicals, and roost loss and modification.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace bats during implementation, specifically when they come out of roosting to forage. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation following RPMs (General Wildlife RPM 1-24). The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. If spotted bats are present, project activities and actions may adversely impact individuals because this project is likely to be actively worked on up to 22 hours per day, even though this is a nocturnal species. Project activities may cause roost abandonment, but spotted bats may be able to move to other parts of the forest to avoid disturbance associated with the drilling prior to hibernation. No potential roosting/reproductive habitat would be altered by the project (General Wildlife RPM 1, 2, 3, 4, 9, 16). The project area would not be affected to such an extent that it would be unusable as foraging habitat by the species in the long term. Overall, these potential impacts would be mitigated through the application of the RPMs to help minimize impacts to individual and local populations during drilling activities (General Wildlife RPM 5-8).

Because adits and shafts in the project area would not be impacted, the proposed action would not directly impact roosts for spotted bats. Any individuals present within mine adits or shafts the project area may be disturbed by noise and vibration impacts and may relocate temporarily prior to hibernation (General Wildlife RPM 4-8). However, during winter, hibernating bats may be awoken with reduced energy supplies to the point where survival of the individual may not be possible. Spotted bats present in the project area could experience impacts from noise, vibration, artificial night lighting, and increased human traffic. Any bats roosting near the project area could abandon roost sites during project activities, and any breeding and foraging activities could be disrupted from during project activities. Project activities should be avoided to the extent possible within close proximity of an active bat roost, and personnel should avoid mine adits or shafts, especially during the evening exodus from day roosts (General Wildlife RPM 4-8). Combustion equipment, such as generators, pumps, and vehicles should not be parked or operated immediately adjacent to the mine adit or shaft (General Wildlife RPM 4-8). Impacts on spotted bats could also result from prey species experiencing the same impacts as the spotted bats, hence altering their predator-prey relationships. Light may attract insects and increase the density of forage for some insectivorous bat species prior to bats hibernating (Bennie et al. 2016). Bat species would experience

impacts from removal of foraging habitat and by noise and vibration from drilling activities prior to hibernation (Siemers and Schaub 2011). Conversely, there is the potential that increased artificial night lighting may be beneficial to some bat species for at least some aspects of their natural history (Fenton and Morris 1976). In addition, artificial light may increase moth (order Lepidoptera) predation by bats and birds (Frank 2006). To the extent possible Project activities would incorporate dark sky-compliant lighting into operations across the entire Project to minimize glare, light trespass, and skyglow concerning bat protection. This includes shading exterior construction lighting for downward display to the extent possible for safety, to prevent lights from being viewed beyond the work area and upwards affecting the night sky (General Wildlife RPM 8). There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for the spotted bat.

5.3.9 *Pacific Marten (Martes caurina; Martes americana origenes)*

GENERAL ECOLOGY AND HABITAT

Pacific martens prefer late-successional stands of mesic, conifer-dominated forest. They occur between 7,000 to 13,000 feet in elevation and mostly above 9,000 feet. Optimum habitat appears to be mature old-growth spruce-fir with more than 40% canopy cover, abundant fallen logs and stumps, and lush shrub and forb vegetation to support prey species. In New Mexico, the species is known only from the north-central mountains including the San Juan and Sangre de Cristo Ranges (Findley et al. 1975; NMDGF 2018). Small open areas, especially meadows, and regenerating stands are used by the species for foraging habitat, and prey species include mice, voles, insects, red squirrels, and snowshoe hare. They also feed on carrion, birds, and bird eggs and during certain times of the year, a significant portion of their diet comprises berries. This species is primarily nocturnal but could be active during the daylight hours. Pacific marten dens typically are found in cavities in large trees, snags, stumps, logs, burrows, caves, rocks, or crevices in rocky areas. They are sensitive to changes in habitat, including timber harvest, snag removal, and firewood collection.

There is approximately 263,881 acres of potential habitat for the Pacific marten on the SFNF. This habitat was modeled using blue spruce, Engelmann spruce, subalpine fir, and Douglas-fir vegetation communities above 9,000 feet in elevation. Marten have been documented on the Espanola and Pecos–Las Vegas Ranger Districts in the Pecos Wilderness and suspected on the Jemez District of the SFNF. No observations of Pacific marten have occurred near the project area, and it is uncertain if potential habitat is currently occupied. The closest known detections of Pacific marten are at Nambe Lake from 2014 and near Santa Fe Lake, between 4 and 4.5 miles from the project area, respectively (email correspondence with Melvin Daniel Burton II, District Biologist, Pecos–Las Vegas Ranger District, Santa Fe National Forest, August 28, 2019). Marten migrate elevationally, so they could potentially occur in the project area during winter months. Other detections of Pacific marten in the vicinity were along the Rio Santa Barbara drainage and San Leonardo Canyon in the northern part of the Pecos Wilderness on wildlife game cameras approximately 21 and 23 miles northwest and northeast of the project area, respectively (Long et al. 2014). Fresh tracks at scat have been identified approximately 0.5 mile northeast of Cerrito del Padre, which is approximately 6.5 miles northeast of the project area. According to Long et al. (2014), scat has also been detected near Santa Fe Baldy, approximately 7 miles northwest of the project area.

EFFECTS ANALYSIS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Drilling activities, noise, vibrations, and presence of humans and equipment would disrupt and displace Pacific martens during implementation. Noise disturbance may disrupt breeding activities; however, there are no documented observations of the species or den sites in the project area. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation following RPMs (General Wildlife RPM 31-24). The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). This would reduce the decibels and the noise range across the landscape below the 69 dBA. Pacific marten is a very elusive woodland species that avoids motorized routes. The San Juan and Sangre de Cristo Mountains of northern New Mexico make up the southern limit of this species' range (BISON-M 2019). The proposed drilling activities would not impact Pacific marten habitat, and any individuals near the project area may avoid the area, resulting in avoidance of otherwise available habitats and foraging modifications. The proposed drilling activities would also not change habitat conditions for this species or their prey because any potential suitable habitat would remain unchanged and large mature trees would not be cut (1, 2, 3, 4, 9, 16). Downed logs would not be removed from the project area because they provide important thermal cover and protection from the weather during winter months as well as potential sources of food and den sites (1, 2, 3, 4, 9, 16).

Drilling activities, noise, vibrations, artificial night lighting, and increased human traffic could disrupt and displace individuals during implementation, specifically when they come out to forage. However, these impacts would be localized, and wildlife are expected to return to the project area after implementation. Pacific marten prey species could also be impacted and would similarly avoid the project area during drilling activities, hence altering their predator-prey relationships. Overall, these potential impacts would be mitigated through the application of the RPMs, such as noise baffling panels, and snags, logs, and stumps would be left intact and on-site to maintain habitat conditions, to help minimize impacts to individual and local populations during drilling activities. There would be no major long-term impacts to these populations or habitat trends under the proposed action.

DETERMINATION OF EFFECTS

The proposed project may impact individuals but is not likely to result in a trend toward federal listing or loss of viability for Pacific marten.

5.4 Neo-tropical Migratory Birds and Bald and Golden Eagles

This section analyzes impacts to neo-tropical migratory birds and bald and golden eagles. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulations promulgated by the Secretary of the Interior. On January 10, 2001, Executive Order 13186 was signed placing emphasis on conservation of migratory birds. The executive order supplements the MBTA, which has been in effect since the early 1900s. In 2008, a memorandum of understanding was signed between the USFS and the USFWS, outlining a collaborative approach to promote the conservation and reduce the take of migratory birds. Specifically, Section D, Items 3 (a) and (b) provide direction to "evaluate and balance long-term benefits of projects against any short- or long-term adverse effects when analyzing,

disclosing, and mitigating the effects of actions” and to “pursue opportunities to restore or enhance the composition, structure, and juxtaposition of migratory bird habitats in the project area.” Item 3 (c) includes direction to “consider approaches, to the extent practicable, for identifying and minimizing take that is incidental to otherwise lawful activities.”

Golden and bald eagles are protected under the Bald and Golden Eagle Protection Act. Under this Act, *take* is defined as to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest or disturb.” *Disturb* is further defined as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” Bald and golden eagles are also protected under the MBTA, which also prohibits take.

Habitat conditions in the project area for the potentially affected migratory bird species had been altered and degraded over time by a combination of human activities in the area. Historic stand-replacing fires before 1945 removed many trees, logging in the early 1900s removed the larger conifer trees in accessible areas, and historic livestock grazing reduced the abundance of tall grasses in some areas. Those activities, combined with fire suppression since the early 1900s, resulted in a lack of frequent surface fires that once maintained fire-adapted ecosystems used by many migratory birds. Since then, fires are still often suppressed, leading to dense forests. However, it has been a long time since the area was mined or logged and grazing management systems have changed to reduce impact on the land. As such, the area has experienced recovery, with grasses and forbs well established and vegetation including trees establishing on old roads and disturbed areas.

MIGRATORY BIRDS

All migratory birds native to the United States are protected under the federal MBTA of 1918. Habitat used by migratory birds ranges widely from early to late-successional stages, from prairie to forest. Migratory birds use these areas for feeding, roosting, and nesting. The project area provides essential habitat components used by some migratory birds. The USFS’s Southwest Region 3 currently analyzes impacts to migratory birds by addressing the following: 1) effects to birds categorized as “Species Conservation Level 1” as identified by New Mexico Avian Conservation Partners (NMACP) (2019), 2) effects to Important Bird Areas (IBAs), and 3) effects to important overwintering areas.

NMACP (formerly New Mexico Partners in Flight) Priority Watch List of 86 species of highest conservation concern includes bird species that are most at risk of extinction without conservation actions to reverse declines and reduce threats. NMACP rank avian species based on overall conservation concern under Species Conservation (SC) and species of concern in maintaining state biodiversity under Biodiversity Conservation (BC). Level 1 includes species of high conservation concern in either the SC or BC category (SC1 and BC1, respectively). For the most part, these are species facing moderate to severe threats and showing unknown or declining local population trends. They are considered to be species in need of immediate conservation action. Level 2 species are considered to be of moderate or potential conservation concern in either the SC or BC category (SC2 and BC2, respectively). They show some signs of vulnerability and may warrant careful monitoring (NMACP 2019).

Of the 17 SC1 avian species identified by NMACP, two that have not already been analyzed above as USFS Sensitive and State-listed have overlapping distribution with and potential habitat in the project area: Virginia’s warbler (*Leiothlypis virginiae*) and Grace’s warbler (*Setophaga graciae*). Table 5.3 includes these two SC1 species along with habitat requirements and analysis of potential impacts from the proposed project (NMACP 2019). The project would not adversely impact migratory birds.

Table 5.3. SC1 Avian Species with Potential Habitat in Project Area and Potential Effects Analysis

Common Name (Scientific Name)	Habitat Requirements	Potential Effects
Virginia's warbler (<i>Leiothlypis virginiae</i>)	Virginia's warbler occurs in mid-elevation coniferous woodland or forest mixes with deciduous shrubs or trees. It never occurs in coniferous forests where there is not a deciduous component (Olson and Martin 1999). Virginia's Warbler is primarily associated with pinyon-juniper and oak woodlands, though in Arizona and New Mexico, it extends upward into mixed conifer habitat containing Gambel Oak, New Mexico locust, maple, or other shrubby deciduous vegetation (Martin 1998; Olson and Martin 1999). In forest and woodland habitat, a dense understory is critical, and steep draws or scrubby hillsides are especially favored (Sedgwick 1987; Yanishevsky and Petring-Rupp 1998). During spring and fall migration, the species uses lower elevation foothills and cottonwood-dominated riparian corridors (Phillips et al. 1964).	Suitable coniferous forest habitat is present in the project area for this species, but the species more commonly occurs at lower elevations. Less than 2 acres of habitat are expected to be impacted by project activities. No active nests would be removed during project implementation, and drilling activities would occur outside of the breeding season. During implementation, Virginia's warbler may be able to move to other parts of the forest to avoid disturbance associated with the drilling. Additionally, IDFs/RPMs are in place that would mitigate the extent of disturbance. For example, noise would be lessened with the use of noise-dampening panels to baffle noise from drilling machinery. Proposed project activities would not adversely impact habitat for this species. No further analysis.
Grace's warbler (<i>Setophaga graciae</i>)	Grace's warbler is a pine specialist and prefers park-like stands of mature tall pines. In the southwest United States, it occurs primarily in ponderosa pine habitat, though Chihuahuah pine and pine-oak woodlands of the Mexican Highlands are also used. Breeding may sometimes extend upslope into mixed conifer habitat (Stacier and Guzy 2002). In New Mexico, it is described as inhabiting mesa tops and canyon bottoms with ponderosa pine (Travis 1992) and may prefer areas with a Gambel oak understory (Levad 1998). It avoids lower elevation areas, even during migration, with far fewer records from the lowlands during migration than other migrant montane species. Grace's Warbler arrives in New Mexico in mid- late-April and initiates nesting in May.	Habitat in and around the project area for this species is present. Less than 2 acres of habitat are expected to be impacted by project activities. No active nests would be removed during project implementation, and drilling activities would occur outside of the breeding season. During implementation, Grace's warbler may be able to move to other parts of the forest to avoid disturbance associated with the drilling. Additionally, IDFs/RPMs are in place that would mitigate the extent of disturbance. For example, noise would be lessened with the use of noise-dampening panels to baffle noise from drilling machinery. Proposed project activities would not adversely impact habitat for this species. No further analysis.

IMPORTANT BIRD AREAS

There are no designated IBAs affected by the project. The IBAs on the SFNF are the Chama River Gorge and the Caja del Rio including the Santa Fe River Canyon below the Caja del Rio on both Bureau of Land Management and USFS lands. There is no association or important link between the bird communities within the project area and these IBAs; therefore, no IBAs are affected by the project.

OVERWINTERING AREAS

Many important overwintering areas are large wetlands. Important overwintering areas recognized on the SFNF include the Pecos River, the Rio Chama, and Rio Grande corridor. Although the project is not located in any of these recognized overwintering areas, the Pecos River is nearby, and overwintering habitat is available for birds throughout the watershed. However, the proposed project is not along the Pecos River and does not include the destruction of any overwintering (riparian) habitat for birds.

DETERMINATION OF EFFECTS

The scope of the proposed action includes exploratory drilling that includes at the project area beginning as soon as all required approvals are granted, lasting no more than 3 calendar years from the date of project implementation. Project activities are planned to occur outside of the migratory bird breeding season and therefore would not impact nesting or breeding activity. Furthermore, the LOP for MSO

would be in effect from March 1 through August 31 and would benefit other avian species within the vicinity of the project area (MSO RPM 3; NOGO RPM 3; General Wildlife RPM 4). This LOP would apply to activities that may result in disturbance (i.e., noise, visual) and project activities would only occur during the LOP when specifically approved by the USFS.

Habitat suitable for any of the above-mentioned species would not be altered or removed by the proposed project in the project area (General Wildlife RPM 1, 2, 3, 4, 9, 16). Some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Many of the trees proposed to be removed are within the existing USFS forest road footprint and would only be removed if absolutely necessary. Mature forest trees and snags would not be affected by the drilling activities, and any snags or other downed woody debris would be left intact and on-site (General Wildlife RPM 1, 2, 3, 4, 9, 16). Downed logs would not be removed from the project area because they provide important thermal cover and protection from the weather during winter months as well as potential sources of food and den sites (General Wildlife RPM 1, 2, 3, 4, 9, 16). Foraging and nesting habitats would not be affected by the drilling activities, and no mature trees would be cut as part of the proposed action. However, some coniferous trees with a dbh less than 6 inches may be cut or trimmed at the drill sites to accommodate equipment. Trees proposed to be removed may include species such as ponderosa pine, Engelmann spruce, Gambel oak, and common juniper. Most tree species would regenerate or return from seed after the project, but species such as Gambel's oak will stump out. As part of the proposed action, tree removal work activities would occur prior to implementation (General Wildlife RPM 1, 2, 3, 4, 9, 16). See Appendix C for the list of trees and their respective dbh that would be removed within each drill site. Photograph D.4 in Appendix D shows an example of potential trees (seedlings/saplings) for removal to accommodate drilling activity for the proposed action. Overall, the potential impacts would be mitigated through the application of the RPMs (see Appendix B) to help minimize impacts to individual and local populations during drilling activities (General Wildlife RPM 1, 2, 3, 4, 9, 16). There would be no major long-term impacts to these populations or habitat trends under the proposed action.

The extent of this disturbance from noise would be lessened with the noise-dampening efforts of Comexico, such as the use of panels to baffle noise from drilling machinery. Comexico has committed to reducing the noise emitted across the forest from the drilling machinery, such as by placing noise baffling shields/panels around the equipment (NOGO RPM 1, 3; General Wildlife RPM 4, 12). Most resident birds would likely move to other suitable habitats nearby during implementation of the proposed action. However, if any nest is identified during the proposed action, it would be flagged and avoided until its activity status can be verified to avoid accidental take of migratory birds in the area (NOGO RPM 2; General Wildlife RPM 4, 19-21). No active nests would be taken out during the proposed action, but some inactive nests may be taken out during the course of the project. Additionally, BMPs and RPMs have been developed to be incorporated into the proposed action to minimize the potential for negative impacts to the species considered. If future activities require vegetation removal during the breeding season (March–August), a pre-construction nesting survey would be required up to 2 weeks prior to vegetation removal to identify and establish the occupancy status of the potentially suitable nests detected within the proposed project area.

The activities associated with the proposed action would not disturb or disrupt courtship of nesting pairs during the migratory season. Project activities are scheduled to occur outside of the Migratory Bird Breeding Season and would only disturb local birds within a very close proximity to the project area. During project activities, birds can move to other areas to avoid disturbance. RPMs (e.g., MSO and NOGO) would help offset some of the impacts of the proposed action on all species outlined in this report. The impacts from the proposed action would not rise to a level that affects the total population size for any species.

6 CUMULATIVE EFFECTS ON THREATENED AND ENDANGERED SPECIES

Cattle grazing and grazing allotment management are the other reasonably foreseeable activities that may occur within the project area. These activities are ongoing on an annual to 3-year basis and would not be expected to affect HGI or MSO. The proposed project would have no cumulative effects on threatened and endangered species or designated critical habitat for the following reasons:

1. No habitat for threatened and endangered species would be adversely affected by the proposed project activities.
2. Project activities are planned to occur outside of the breeding and nesting season for threatened and endangered species for year 2021 through 2023.
3. Proposed project activities would last for less than 1 calendar year from project implementation.
4. The project area has undergone periods of mining and exploration activity since the early 1900s and is evidence that species present are capable of sustaining during and after these activities.
5. Motorized vehicle use in the project area is restricted to the activities associated with the proposed action, so any cumulative effects associated with motorized vehicle access can be more effectively mitigated.

6.1 Determination of Effects

Based on the information above, the proposed project would have **no cumulative adverse effects on HGI or MSO** because the proposed project would not adversely affect these species.

7 SUMMARY OF EFFECTS

Activities associated with the proposed project would **not lead toward the federal listing of, or result in the loss of viability of any USFS- or State of New Mexico-listed species, or migratory birds and would not result in a downward population or habitat trend for MIS** or their habitats because their habitats would not be removed or degraded or because they occur in extremely small quantities in the project area.

Based on the information above, the proposed project would have **No Effect on HGI and May Affect, but Not Likely to Adversely Affect MSO.**

Based on the information above, the proposed project **May Affect, but Not Likely to Adversely Affect MSO designated critical habitat.**

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APPENDIX A

Project Maps

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Map contains confidential species information.

Figure A.1. Project vicinity.

Map contains confidential species information.

Figure A.2. Project area with natural resources data.

Map contains confidential species information.

Figure A.3. Mexican spotted owl and northern goshawk detections.

Map contains confidential species information.

Figure A.4. USFS sensitive species occurrences in the vicinity of the project area.

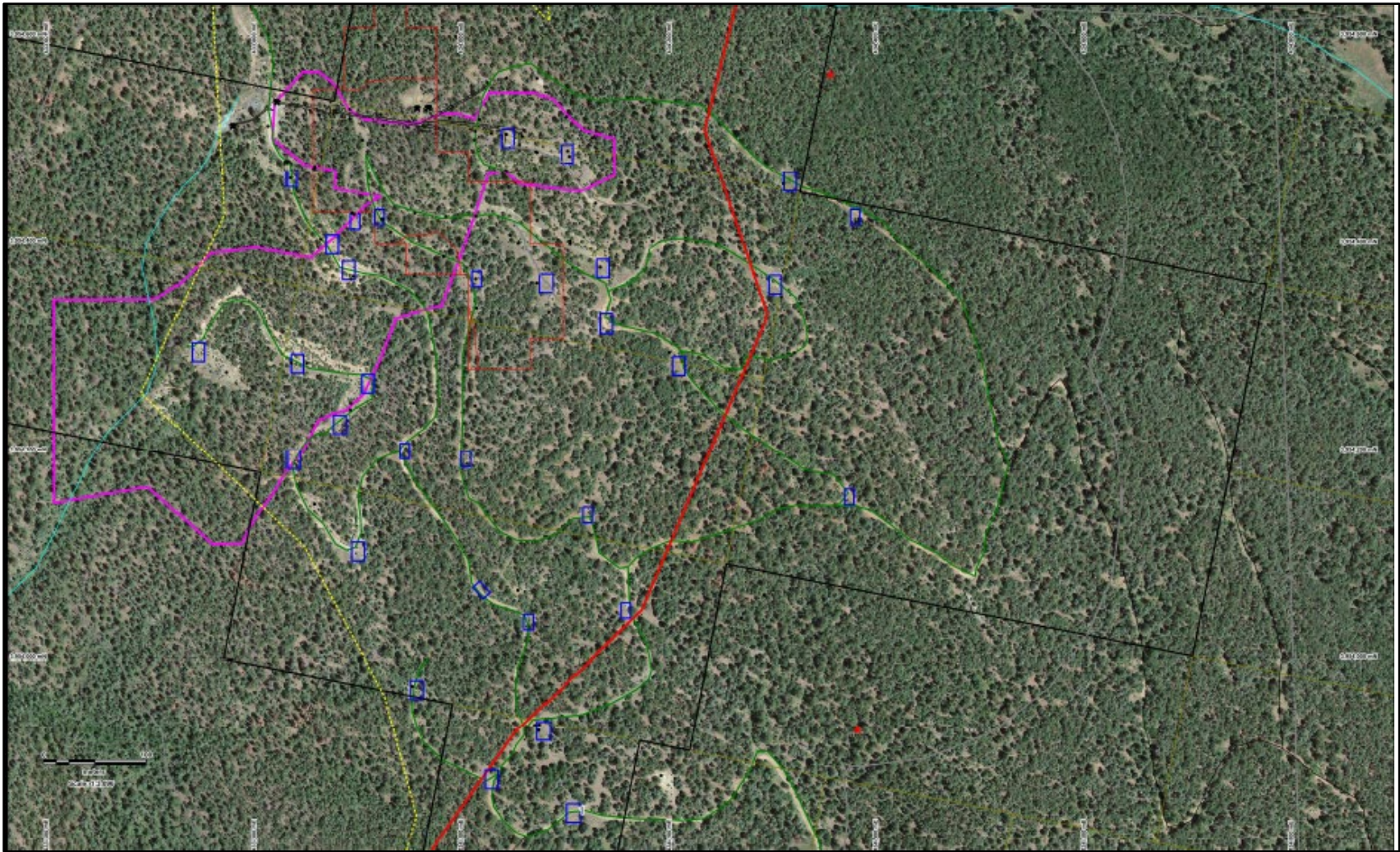


Figure A.5. Existing access roads and evidence of former exploration and mining-related disturbance.

APPENDIX B

**Pecos–Las Vegas Ranger District, Santa Fe National Forest
Resource Protection Measures and Best Management Practices**

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Project-wide Resource Protection Measures and Best Management Practices

Pecos–Las Vegas Ranger District, Santa Fe National Forest

Resource protection measures (RPMs) (sometimes referred to as mitigation measures) are requirements developed to avoid, minimize, reduce, or eliminate negative impacts to project area resources that could result from actions proposed (40 Code of Federal Regulation [CFR] 1508.20). The following RPMs include and would be in addition to standards and guidelines from the Santa Fe National Forest Plan, as amended, and BMPs. During implementation, all applicable guidelines and policies would be followed. These include, but are not limited to, Regional Invasive Species guidance, New Mexico Air Quality Regulations, and Threatened and Endangered Wildlife Species Recovery Plans.

The RPMs would be incorporated into all project activities and used to guide project personnel in conducting implementation. RPMs are developed by resource specialists to ensure the avoidance and minimization of negative effects from implementation actions and would be integrated as part of all project activities for this project.

Best management practices (BMPs) are methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (36 CFR 219.19). Best Management Practices (BMPs) were developed by the USDA Forest Service (2012) in an effort to mitigate non-point source pollution from Forest activities. When properly implemented they have been shown to protect water quality. The BMPs below are crafted specifically for this project. The complete list of general BMPs can be found here: https://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf

CULTURAL AND ARCHAEOLOGICAL RESOURCES

The Forest Service would work with the Pueblos and Tribes and the operator to arrange short-term operation shut downs to allow for religious and cultural practices in the area.

If any archeological or paleontological resources are discovered during the operation, all work at the discovery site would stop immediately and Comexico would contact the Pecos/Las Vegas Ranger District Archeologist. Work at the discovery site would not proceed until authorized by the Forest Service.

BIOLOGICAL RESOURCES

Implementation, layout, preparation, and closeout/reclamation personnel, including the company, partners, contractors, and others would be briefed on all applicable RPMs, BMPs, and standards and guidelines from the Forest Plan, recovery plans, etc. prior to implementation, between phases and as needed, such as personnel changes.

A. Mexican Spotted Owl

The following MSO criteria were developed in May 2019 with the U.S. Fish and Wildlife Service.

1. The Santa Fe National Forest Plan (1987, as amended) would be implemented, which includes the 1995 MSO Recovery Plan. Additionally, the 2012 MSO Recovery Plan would also be implemented.
2. A minimum of 2 years of inventory would be conducted to 2012 MSO Survey Protocol standards, by Fish and Wildlife Service permitted individuals, in all potential spotted owl habitat areas including protected, restricted, nest/roost, mixed conifer, designated critical habitat and other forest and woodland types within the project area plus the area ½ mile beyond the perimeter of the proposed activities areas. Site-specific protections would be implemented in accordance with the MSO Recovery Plan, such as delineation of Protected Activity Centers (PAC).
3. A Limited Operating Period (LOP) would be in effect from March 1 through August 31 within ¼ mile of active spotted owl nests, occupied PACs and potentially suitable habitat within 0.5 miles of the project area that was not surveyed to protocol. Project work would not occur within the LOP.
4. Project activities and species inventory would be planned in coordination with the USDA Forest Service and, as applicable, with consultation between the USDA Forest Service with the USDI Fish & Wildlife Service.
5. All personnel conducting project activities would be briefed on these RPMs, including how to avoid harassment, report sightings, and what to do if a Mexican spotted owl is incidentally injured, killed, or found injured or dead. If an owl fatality is discovered, project personnel shall immediately notify a qualified USFS wildlife biologist and contact the USFWS for further guidance.

B. Northern Goshawk

1. Prior to activities that may result in disturbance (such as noise, visual), suitable goshawk habitat within the project area, including ½ mile beyond the project boundary, would be surveyed to R3 Survey protocol by qualified individuals.
2. If the species is found in the area, according to protocol, Goshawk Post-Fledging Areas (GPFA), Goshawk Home Ranges (GHR) and Goshawk Nest Areas (GNA) would be designated.
3. A LOP would be in effect from March 1 through September 30 within ¼ mile of active GNA and GPFA boundaries, and potentially suitable habitat that was not surveyed to protocol. Project work would not occur within the LOP.

C. General Wildlife

1. Disturbance, such as crushing or displacement, of large down logs, snags (standing, dead tree), large rocks and boulders would be avoided (with the exception of those blocking access roads).

2. Snags would be retained unless they are within falling distance of roads or landings, or would pose a safety hazard. Snags that are cut for safety reasons (within striking distance of a high human residency time area, e.g., laydown area, drill site, or designated FS road) would be left after felling to contribute to downed log habitat.
3. Slash piles would be located a sufficient distance from large snags, large down logs, and large trees to ensure these habitat features would not ignite if piles burn later.
4. Activities that may result in disturbance (such as noise, visual) including, but not limited to, people presence, equipment, tree cutting/piling and generators would occur outside of breeding/nesting season to minimize impacts to migratory birds and bats. Breeding season is from March 1 through August 15.
5. Mine shafts, adits, caves, and crevices would not be entered unless absolutely necessary for project work. Before entering mine shafts, adits, caves, crevices, etc., all objects such as equipment, boots, clothing, etc. would be decontaminated following white-nose syndrome disinfection/decontamination protocol Check for updated protocols between project phases. (<https://www.whitenosesyndrome.org/static-page/decontamination-information>).
6. Any bats observed would not be harassed or handled. Caves, mine shafts, adits, crevices, etc. that are observed to house bats would not be visited more than one day. If such is needed, coordination with the District biologist would occur prior, to discuss and minimize potential impacts.
7. Project activities would be avoided to the extent possible within close proximity of an active bat roost and personnel should avoid mine adits or shafts, especially during the evening exodus from day roosts. Internal combustion equipment, such as generators, pumps, and vehicles, would not be parked or operated immediately adjacent to the mine adit or shaft.
8. To minimize impacts to bats and owls (including MSO), Project activities would incorporate dark sky–compliant lighting into operations across the entire project to minimize glare, light trespass, and skyglow, to the greatest extent possible. Exterior construction lighting would be shaded for downward display to the extent possible for safety, to prevent lights from being viewed beyond the work area and upwards affecting the night sky.
9. Tree felling would be directed away from mature trees designated to be retained. Machinery would avoid contact with mature trees designated to be retained.
10. Vehicles, ATVs and UTVs would not travel off of existing roads and predetermined overland routes. Project personnel would not drive around recreationally. Roads that are disappearing from the landscape (grown-over/revegetating, numerous logs across, or numerous large rocks, etc.) would not be reopened and traveled on, even if they appear in the roads mapping layer.
11. Entrapment, entanglement, and electrocution of wildlife would not occur. Equipment would be installed, used, and maintained to avoid risks to wildlife. Drill holes and pipes would not be left open when unattended.

12. Noise would be mitigated to minimize both the level and distance the noise can be heard from. This would be done through techniques such as using functioning mufflers on engines and noise-dampening panels around drilling machinery. This would occur in all seasons because some species use the area even during winter months.
13. Structures and improvements (such as tanks, fences, water troughs, windmills, corrals, etc.) would be protected during project implementation. If damaged, such would be reported to the USFS range and biology specialists and would be repaired as part of the project. If reconstruction of these features is required, reconstruction would ensure that the features are wildlife-friendly, minimizing the risk of entrapment and injury.
14. No new roads (permanent or temporary) would be created other than up to 0.2 mi of overland routes. Roads used for the project would be considered for decommissioning after the project has been completed. The decommissioning process would block public vehicle access and mitigate for erosion control (such as re-contouring, providing roughness) and promote revegetation.
15. To the extent possible, existing disturbed areas would be used before creating new disturbed sites.
16. The District Biologist would be consulted prior to implementation of each activity type (i.e., at the beginning of tree cutting, beginning of drilling, etc.).
17. Leave No Trace practices would be followed, such as pack-in-pack-out of trash, and human waste management. (<https://lnt.org/learn/7-principles>)
18. Fire restrictions would be followed, and care would be taken, to prevent vehicles and equipment from igniting items such as vegetation, dry materials, and fuels. Fire extinguishing equipment would be on site during elevated fire danger periods.
19. A Forest Service biologist would be notified upon discovery of a den or large stick type nest. From February through September, noise-producing project activities within ½ mile of the den or nest would be temporarily paused, at least until it is investigated by a Forest Service biologist who would provide recommendation for proceeding. Small nests would be avoided; human activity would only be for short durations (less than a half hour) within 50 feet of small nests during the breeding season.
20. If any Forest Service Sensitive Species, or Threatened or Endangered species is located within or near the project area before or during implementation, work in the area would cease until a Forest Service Biologist has been notified, investigated the site, and made recommendations.
21. There would be no killing, harassment, removal or handling of animals, nests, eggs, dens, etc.
22. Project activities (especially those that might block roads or use water sources) would be planned in advance in coordination with USDA Forest Service Range Specialists to reduce potential conflicts with grazing allotment permittees, especially regarding water, fences, gates, and roads.
23. Post-project cleanup and reclamation would occur and would be done with consultation with USFS personnel, including hydrologists and biologists.
24. Project personnel would also implement all additional requirements and recommendations from the New Mexico Department of Game and Fish and the USFWS.

D. Botany; Weeds and Holy Ghost Ipomopsis

1. Staging, storage and parking of vehicles and equipment would be done in weed free areas.
2. Prior to surface disturbance activities, known noxious and invasive weeds known or observed to occur within the Project Area would be marked with signs or flagging to alert construction personnel to the locations and type of weeds present. Staging of equipment would be done in weed-free areas. Driving through or parking in weed areas on the way to the project area, such as in the weed areas on private and New Mexico Department of Game and Fish property, would be prohibited. Travel through these areas would be minimal and strategic.
3. Disturbance areas (e.g., staging, parking, etc., if needed) would be located outside of known weed areas by at least 300 feet. GIS mapping layers, Forest/District Weed specialists and the District Biologist would be consulted prior to implementation, road brushing, road blading, ditch clearing, etc. There are known scotch and bull thistle infestations in and surrounding the area.
4. All vehicles and off-road equipment (including ATVs, UTVs), tools, gear, personnel, clothing, etc. would be weed-free prior to entering the project area. Equipment and vehicles would be pressure-washed, inspected and weed-free (includes free of mud and vegetation) before entering the project area.
5. Project activities would not occur within the enclosure for HGI near Indian Creek. The road (FSR 192 upstream of the intersection with FSR 120) that exists immediately adjacent to this enclosure would be closed to associated project use.
6. New occurrences of Threatened, Endangered, or Sensitive (TES) plant species and weeds discovered before or during project activities would be reported to the USFS to be evaluated for protection measures such as through flag-and-avoid methods.
7. Seed mixes, mulches, and fill would be certified weed-free. Seed mixes used for re-vegetation of disturbed sites would consist of locally adapted native plants to the extent practicable.
8. Topsoil removed from drill sites would be stored on-site at the drill site to minimize distributing undesirable plants or gaining new ones. Topsoil would not be stored in areas of known non-native vegetation. Topsoil with known non-native vegetation would not be stored in areas that do not already have that specific species of non-native vegetation. Preferably, the topsoil would be stored at the drill site from which it originates.
9. Disturbed areas are to be monitored during the following two growing seasons to observe establishment and spread of weeds, which would then be documented and removed.
10. Additional invasive species management guidelines are found at:
11. Guidance for Invasive Species Management in the SW Region:
https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3801891.pdf and
<https://www.fs.usda.gov/detail/r3/forest-grasslandhealth/invasivespecies/?cid=stelprd3833403>.

E. Watershed and Aquatic Resources

1. Prior to operations beginning, Comexico will complete all necessary permitting under Clean Water Act requirements. This includes preparing and adhering to a Stormwater Pollution Prevention Plan if required.
2. Comexico will adhere to guidelines under the New Mexico Administrative Code 19.27.4 for drilling and plugging of wells. All boreholes would be closed or abandoned.
3. In the event any historic mine waste is encountered during road improvements and or maintenance, it would be removed and disposed in a manner that is protective of surface water and groundwater quality.
4. Prior to any use on-site, a ground water sample shall be collected from well UP 00826 and tested for New Mexico Water Quality Control Commission (NMWQCC) constituents. NMED will evaluate the results, and if any constituent is found to exceed 20.6.2.3103 NMAC standards, use of the water on-site may not be permitted.
5. Utilize USFS technical publication, including Drain Dips, Waterbars, Diverters, and Open-Top Culverts-Surface Water Drainage of Low-Volume Roads (USFS 2014) for road maintenance.
6. Surface disturbing activities shall be located to the greatest extent practicable where existing roads or previous used drill sites have already disturbed the soil.
7. All disturbed surface areas would be managed and reclaimed as required by applicable permits. Disturbance areas would be decommissioned and/or evaluated at the project end to ensure soil stability and erosion prevention.
8. Riparian/Aquatic Management Zones (AMZ) would include a minimum width of 100 feet from the bank-full mark of each water feature (includes ephemeral, intermittent and perennial creeks, springs, and wetlands) or from the outer edge of riparian vegetation, or would be a site-appropriate delineation, whichever is greater, for each water feature.
9. Vehicle (such as trucks and ATV/UTV) and equipment use in AMZs would only occur on existing, designated roads or drill site location. If multiple roads lead to the same general destination, travel would occur on the route that is not in a drainage bottom or paralleling a drainage in its riparian zone or high-water mark. Roads which have culvert crossing or that perpendicularly cross creeks and riparian areas are acceptable for use.
10. New disturbance areas (expanding drill sites, fueling, and equipment staging/maintenance areas) would be located outside of AMZs and would be the minimum size needed for their function. Existing disturbance areas within AMZs may be used by agreement (with a USFS biologist or hydrologist) when the effects of water quality concerns can be abated by erosion prevention measures.
11. Vehicle access would not occur when use could result in rutting of roads. Travel on access routes and trails would not occur during or soon after periods of wet weather when use could result in rutting of road/trail surface or adverse soil erosion/sediment transport. If this is unavoidable, any rutting or soil damage would be repaired.
12. Equipment staging and storage would only occur at the designated laydown area.
13. Refueling, including ground-based equipment (such as UTVs), generators and hand tools (such as chainsaws), would not occur in AMZs, but could be done at the laydown area or drill sites, outside of AMZs.

14. Spill containment materials (e.g., absorbent pads, etc.) would be on-site and used to ensure that spills would not leave the disturbance areas. Fuel containers and equipment (such as generators) would be placed on spill mats (or other appropriate container) and preferably within truck or UTV beds, rather than on the ground. Contaminated soils would be properly removed from Forest Service land. Spills would be immediately reported to the Forest Service project lead, hydrologist/watershed specialist and biologist. Prevention, Reporting, and Remediation are listed below:

- a. **Prevention of petroleum product spills**—If operator or contractor maintains storage facilities for oil or oil products on or near the project area, the operator or contractor shall take appropriate preventive measures to ensure that any spill of such oil or oil products does not enter any stream or other waters of the United States or any of the individual States.
- b. **Reporting of petroleum product spills**—The U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department have delegated authority for emergency actions related to spills, so the operator or contractor must report spills to those agencies as required.

The operator or drilling contractor must also immediately report all petroleum product spills which leave visible soil contamination to the USFS representative. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

- c. **Remediation of petroleum product spills**—Small spills (spills that are not reportable to EPA or New Mexico Environment Department) may be remediated by placing the contaminated soil with a shovel into plastic bags, removing the contaminated soil from site and disposing of it where they are disposing used oil.

All other spills must be remediated as directed by the EPA and New Mexico Environment Department.

15. Equipment would be washed and maintained free of oil leaks prior to and during use in the project area.
16. Drilling fluid/mud would be properly contained to prevent runoff. At the end of the proposed activity, the mud pit liners would be folded over the top of the dried contents, and the pit would be filled and recontoured. If ground water is encountered when excavating mud pits, that location should not be used as a mud pit.
17. Riparian species (alder, willows, cottonwood, aspen, etc.) would not be cut or removed.
18. If Water is brought in from offsite for use during operations water should be free of aquatic invasive species and must meet applicable state water quality standards .
19. Slash scattered or piled (slash piles) would only occur outside of AMZs, swale bottoms, and the high-water mark of springs, lakes, ponds, and channels (including perennial, intermittent, and ephemeral). Slash would not be scattered or piled in road drainages.
20. When necessary to provide ground cover, access routes, drill sites, parking, staging areas, and other disturbed areas would be assessed, in agreement with the USFS, to be scarified and seeded with weed-free, native grasses and forbs, and weed-free mulched at the conclusion of project activities and/or may be covered with project slash. Edge berms and rutting would be removed and re-contoured. Route entrances would be camouflaged with slash and/or rocks to discourage use.
21. Roads, access routes, drill sites, , staging areas, and other disturbed areas, would have adequate drainage such as silt fencing, compostable bio socks, water-bars, rolls, dips, and armoring and placed as needed to minimize runoff channeling and erosion risk, especially on features meant for extended use (overwinter) such as roads. Water-bars would be installed with the maximum spacing dependent on slope gradient and cut at an angle of 30 degrees with a depth of 12 to 18 inches.
22. Erosion control measures, such as silt fencing, compostable bio socks, water-bars, culverts, and ditches, would be kept current (functioning) through periodic monitoring for effectiveness and subsequent maintenance as necessary before, during, and at the end of the project.
23. Roads would be maintained to standards for minimized hydrology and aquatic impacts before, during, and at the end of the project. Road prisms would not be widened. The road maintenance plan included in the Plan of Operations will be adhered to.
24. Topsoil removed from the drill sites would be stored in a manner that would not block drainages and would have sediment/erosion mitigations installed and maintained.
25. After use, drill sites would be rehabilitated. Portions of the drill site beyond the roadbed would be restored to pre-implementation conditions, to contour with natural drainage, and/or with erosion mitigation structures designed and constructed to remain functional through high flow events and extended periods of time (decades).
26. Drilling would be done in a manner that would consider and avoid impacts to groundwater, including not altering spring flows and not contaminating waters.

APPENDIX C

Trees Proposed for Removal at Drill Sites and Staging Area

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Drill Hole Site	X_UTMn83z13 (m)	Y_UTMn83z13 (m)	Site Dimensions (feet)	Status	Tree number	Notes
DH01	433792	3954612	60 x 40	removed July 16, 2019		
DH02	433772	3954516	60 x 40	removed July 16, 2019		
DH03	433817	3954514	60 x 40	removed August 6, 2019		
DH04	433904	3954503	60 x 40	removed August 6, 2019		
DH05	433745	3954296	60 x 40	retained	14	12 conifers at to 2–3" dbh, 2 at 4" dbh
DH06	433839	3954285	60 x 40	retained	21	18 conifers at 2–3" dbh, 2 at 4" dbh and 1 at 5" dbh
DH07	433873	3954397	60 x 40	retained	2	2 conifers at up to 2" dbh
DH08	433889	3954374	60 x 40	retained	7	6 conifers at 2-3" dbh, 1 conifer at 6" dbh
DH09	433836	3954192	60 x 40	retained	14	14 conifers at 2" dbh
DH10	433880	3954226	60 x 40	retained	11	11 conifers at 2–3" dbh
DH11	433907	3954266	60 x 40	high certainty of use	40	40 conifers at 1_3" dbh
DH12	433887	3954100	60 x 40	removed July 16, 2019		
DH13	433898	3954103	60 x 40	retained	4	1 juniper shrub at 7' diameter, 3 conifers at 3" dbh
DH14	434043	3954501	60 x 40	high certainty of use	0	0 trees
DH15	434099	3954486	60 x 40	retained	0	0 trees
DH16	434315	3954460	60 x 40	retained	0	0 trees
DH17	434065	3954407	60 x 40	removed July 16, 2019		
DH18	434134	3954376	60 x 40	retained	4	3 conifers at 2–3" dbh, 1 at 4" dbh
DH19	434080	3954361	60 x 40	retained	65	55 conifers including USFS road, overland route, and site at sapling to 3" dbh, 7 at 3–4" dbh, 3 at 5" dbh
DH20	434139	3954347	60 x 40	removed July 16, 2019		
DH21	434136	3954324	60 x 40	retained	0	0 trees
DH22	434206	3954282	60 x 40	retained	3	3 conifers at 3" dbh
DH23	434301	3954359	60 x 40	retained	1	1 conifer at 4" dbh
DH24	433955	3953971	60 x 40	retained	5	5 conifers at 2–3" dbh
DH25	434077	3953931	60 x 40	retained	0	0 trees
DH26	434027	3953884	60 x 40	retained	0	0 trees

Drill Hole Site	X_UTMn83z13 (m)	Y_UTMn83z13 (m)	Site Dimensions (feet)	Status	Tree number	Notes
DH27	434106	3953852	60 x 40	retained	1	1 conifer at 3" dbh
DH28	433778	3954643	60 x 40	removed August 6, 2019		
DH29	433789	3954622	50 x 30	removed July 16, 2019		
DH30	433793	3954607	50 x 30	removed July 16, 2019		
DH31	433772	3954515	50 x 30	removed July 16, 2019		
DH32	433793	3954535	50 x 30	removed July 16, 2019		
DH33	433813	3954544	50 x 30	removed July 16, 2019		
DH34	433813	3954528	50 x 30	removed July 16, 2019		
DH35	433814	3954513	50 x 30	removed July 16, 2019		
DH36	433834	3954463	50 x 30	high certainty of use	0	0 trees
DH37	433907	3954506	50 x 30	removed July 16, 2019		
DH38	434011	3954562	50 x 30	removed August 6, 2019		
DH39	434075	3954552	50 x 30	removed July 16, 2019		
DH40	434043	3954499	50 x 30	removed July 16, 2019		
DH41	434103	3954486	50 x 30	removed July 16, 2019		
DH43	434072	3954413	50 x 30	removed July 16, 2019		
DH44	434064	3954403	50 x 30	removed July 16, 2019		
DH45	433919	3954425	50 x 30	high certainty of use	13	13 conifers , sapling to 3" dbh
DH46	433895	3954421	50 x 30	high certainty of use	34	34 conifers, sapling to 3" dbh
DH47	433875	3954397	50 x 30	removed July 16, 2019		
DH48	433891	3954377	50 x 30	removed July 16, 2019		
DH49	433742	3954296	50 x 30	removed July 16, 2019		
DH50	433840	3954282	50 x 30	removed July 16, 2019		
DH51	433836	3954195	50 x 30	removed July 16, 2019		
DH52	433877	3954225	50 x 30	removed July 16, 2019		
DH53	433909	3954263	50 x 30	removed July 16, 2019		
DH54	434013	3954365	50 x 30	high certainty of use	7	7 conifers at up to 2" dbh
DH55	434078	3954361	50 x 30	removed July 16, 2019		
DH56	434084	3954358	50 x 30	removed July 16, 2019		

Drill Hole Site	X_UTMn83z13 (m)	Y_UTMn83z13 (m)	Site Dimensions (feet)	Status	Tree number	Notes
DH57	434095	3954344	50 x 30	removed July 16, 2019		
DH58	434134	3954373	50 x 30	removed July 16, 2019		
DH59	434135	3954358	50 x 30	removed July 16, 2019		
DH60	434135	3954340	50 x 30	removed July 16, 2019		
DH61	434137	3954322	50 x 30	removed July 16, 2019		
DH62	434152	3954363	50 x 30	removed July 16, 2019		
DH63	434310	3954462	50 x 30	removed July 16, 2019		
DH64	434319	3954457	50 x 30	removed July 16, 2019		
DH65	434377	3954424	50 x 30	retained	5	5 conifers, saplings up to 1"
DH66	434291	3954355	50 x 30	removed July 16, 2019		
DH67	434303	3954355	50 x 30	removed July 16, 2019		
DH68	434371	3954156	50 x 30	retained	3	3 conifers at 2–3" dbh
DH69	434155	3954047	50 x 30	retained	0	0 trees
DH70	434078	3953930	50 x 30	removed July 16, 2019		
DH71	434107	3953851	50 x 30	removed July 16, 2019		
DH72	434022	3953887	50 x 30	removed July 16, 2019		
DH73	433953	3953971	50 x 30	removed July 16, 2019		
DH74	433889	3954101	50 x 30	removed July 16, 2019		
DH75	433899	3954102	50 x 30	removed July 16, 2019		
DH76	433777	3954641	50 x 30	removed July 16, 2019		
DH77	433943	3954201	50 x 30	high certainty of use	0	0 trees
DH78	434002	3954193	50 x 30	high certainty of use	25	25 conifers, sapling to 2" dbh
DH79	434118	3954140	50 x 30	retained	25	25 conifers at 2–3" dbh
DH80	434127	3954102	50 x 30	removed July 16, 2019		
DH81	434158	3954084	50 x 30	removed July 16, 2019		
DH82	434016	3954067	50 x 30	retained	6	6 conifers at 2" dbh
DH83	434063	3954036	50 x 30	retained	60	57 conifers at 2–3" dbh, 3 at up to 4–5" dbh
DH84	434207	3954283	60 x 40	removed July 16, 2019		

APPENDIX D

Project Photographs

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Photograph D.1. View of drill site in the southern part of the project area, facing south.



Photograph D.2. View of drill site in the western part of the project area, facing east.



Photograph D.3. View of drill site in the eastern part of the project area, facing east.



Photograph D.4. View of drill site in the central part of the project area, facing south. The red circles indicate potential seedlings/saplings for removal to accommodate drill sites for the proposed action.



Photograph D.5. View of drill site in the northern part of the project area, facing south.



Photograph D.6. View of the staging area. Note the plastic trough (just outside the project area) in the background, view facing southeast.



Photograph D.7. View of a seasonally wet area within the staging area in the southeast corner of the project area.



Photograph D.8. View of a seasonally wet area adjacent to an old mine adit, facing north.



Photograph D.9. View of the small pond adjacent to the old mine shaft. Groundwater comes to the surface along the hillside, view facing northwest.



Photograph D.10. Downstream view of the ephemeral drainage adjacent to an old mine adit, facing southwest.

APPENDIX E

Aquatic Resources Delineation Data Forms

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WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Camarillo Jones Hill County: Santa Fe/San Miguel Sampling Date: July 27, 2019
 Applicant/Owner: SWCA Environmental Consultants State: NM Sampling Point: Observation Point 1
 Investigator(s): I. Dolly and E. Dolly Section Township Range: Sec 1, T17N, R11E
 Landform (hillslope, terrace, etc.): Hillslope, Old mine site Local relief (concave, convex, none): None Slope (%): 20%
 Subregion (LRR): Rocky Mountain Range and Forest Region Lat: 35.732677 Long: -105.731668 Datum: NAD 83
 Soil Map Unit Name: Kaolynich Family, 15 to 40 percent slopes NW classification: Up and
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation No, Soil No or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No X
 Are Vegetation No, Soil No or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydro Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: This point was determined not to be within a wetland due to the lack of hydrophytic vegetation.					
Area is significantly disturbed by historic mining operations.					

VEGETATION - Use scientific names of plants.

Line Stratum (Plot size: <u>30 ft.</u> ;	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None Observed</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. <u> </u>				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. <u> </u>				
4. <u> </u>				
= Total Cover				
Shrub/Scrub Stratum (Plot size: <u>15 ft.</u> ;				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. <u>None Observed</u>				Prevalence Index Worksheet:
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
= Total Cover				
Herb Stratum (Plot size: <u>5 ft.</u> ;				
1. <u>canis aculeolata</u>	20	Yes	UPL	Total % Cover of: Multiplied by:
2. <u>Schizanthus prolatus</u>	10	Yes	FACU	
3. <u>agrostis elatior</u>	5	No	FACW	
4. <u>theropops rhomboides</u>	5	No	FACU	
5. <u> </u>				
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				
11. <u> </u>				
40 = Total Cover				
Woody/Vine Stratum (Plot size: <u>30 ft.</u> ;				
1. <u>None Observed</u>				Prevalence Index = (A) / (B) = <u>4.28</u>
2. <u> </u>				
= Total Cover				
% Bare Ground in Herb Stratum: <u>60</u>				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
Remarks: No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indicated as FACU or FACW).				

SOILSampling Point: Observation Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Restrictive Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10y/ 4/2	13					Organic Soil Layer	Mostly decomposing plant matter
1-3	10y/ 6/2	99	5y/ 6/9	2	N/A	N/A	Sandy Loam	Very gravelly, next to old road.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Part Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Hist. Epipedon (A2)	<input type="checkbox"/> Striped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (I-B)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u> </u> Rock <u> </u> Depth (inches) <u> </u> 4 <u> </u>	Hydric Soil Present? Yes <u> X </u> No <u> </u>
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Remarks:
A positive indication of hydric soil was observed.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (39) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (39) (MLRA 1, 2, 4A, and 4B)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Wave Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Scum or Voids on Aerial Imagery (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D8) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Irradiation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			

Field Observations: Surface Water Present? Yes <u> </u> No <u> X </u> Depth (inches) <u> </u> 0 <u> </u> Water Table Present? Yes <u> X </u> No <u> </u> Depth (inches) <u> </u> 2 <u> </u> Saturation Present? Yes <u> X </u> No <u> </u> Depth (inches) <u> </u> 1 <u> </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u> X </u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Camarillo/Jones Hill County: Santa Fe/San Miguel Sampling Date: July 27, 2019
 Applicant/Owner: SWCA Environmental Consultants State: NM Sampling Point: Observation Point 2
 Investigator(s): I. Dolly and E. Dolly Section Township Range: Sec 1, T17N, R11E
 Landform (hillslope, terrace, etc.): Hillslope, Old mine site Local relief (concave, convex, none): None Slope (%): 20%
 Subregion (LRR): Rocky Mountain Range and Forest Region Lat: 35.732425 Long: -105.732242 Datum: NAD 83
 Soil Map Unit Name: Kaoquich Family, 15 to 40 percent slopes NW classification: Up and
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation No, Soil No or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No No X
 Are Vegetation No, Soil No or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydro Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: This point was determined not to be within a wetland due to the lack of hydrophytic vegetation. Area is significantly disturbed by historic mining operations.					

VEGETATION - Use scientific names of plants.

Line Stratum (Plot size: <u>30 ft.</u> ;	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None Observed</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. <u> </u>				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u> </u>				
4. <u> </u>				
= Total Cover				
Shrub/Scrub Stratum (Plot size: <u>15 ft.</u> ;				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
1. <u>Pinus ponderosa</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index Worksheet: Total % Cover of: Multiplied by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species <u>45</u> x 4 = <u>180</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>75</u> (A) <u>270</u> (B) Prevalence Index = B/A = <u>3.60</u>
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
= Total Cover				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is >3.0 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Probable Hydrophytic Vegetation ¹ (Explain) Indicators of hydroic soil and wetland hydrology must be present, unless disturbed or problematic
Herb Stratum (Plot size: <u>5 ft.</u> ;				
1. <u>Polygonum bistorta</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Centaurea occidentalis</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
= Total Cover				
Woody/Vine Stratum (Plot size: <u>30 ft.</u> ;				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
1. <u>None Observed</u>				
2. <u> </u>				
= Total Cover				
% Bare Ground in Herb Stratum: <u>30</u>				
Remarks: No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indicated as FACU or FAC).				

SOILSampling Point: Observation Point 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Restrictive Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10y/ 4/2	13					Organic Soil Layer	Mostly decomposing plant matter
2-4	10y/ 6/2	99	5y/ 6/9	2	N/A	N/A	Sandy Loam	Very gravelly, next to old road.

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Part Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Hist. Epipedon (A2)	<input type="checkbox"/> Striped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (I18)		

Restrictive Layer (if present): Type: <u> </u> Rock Depth (inches): <u> </u> 4	Hydric Soil Present? Yes <u> X </u> No <u> </u>
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Remarks:
A positive indication of hydric soil was observed.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (39) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (39) (MLRA 1, 2, 4A, and 4B)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Wave Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Scum or Voids on Aerial Imagery (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D8) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Irradiation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			

Field Observations: Surface Water Present? Yes <u> </u> No <u> X </u> Depth (inches): <u> </u> 0 Water Table Present? Yes <u> X </u> No <u> </u> Depth (inches): <u> </u> 2 Saturation Present? Yes <u> X </u> No <u> </u> Depth (inches): <u> </u> 1 (includes capillary fringe)	Wetland Hydrology Present? Yes <u> X </u> No <u> </u>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
A positive indication of wetland hydrology was observed (at least one primary indicator).

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Camarillo/Jones Hill County: Santa Fe/San Miguel Sampling Date: July 27, 2019
 Applicant/Owner: SWCA Environmental Consultants State: NM Sampling Point: Observation Point 3
 Investigator(s): I. Dolly and E. Dolly Section Township Range: Sec 1, T17N, R11E
 Landform (hillslope, terrace, etc.): Old mine site Local relief (concave, convex, none): None Slope (%): 20%
 Subregion (LRR): Rocky Mountain Range and Forest Region Lat: 35.724451 Long: -105.724727 Datum: NAD 83
 Soil Map Unit Name: Kaoquich Family, 15 to 40 percent slopes NW classification: Up and
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation No, Soil No or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No No X
 Are Vegetation No, Soil No or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u>	No <u>X</u>
Hydro Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: This point was determined not to be within a wetland due to the lack of hydrophytic vegetation.					
Area is significantly disturbed by historic mining operations.					

VEGETATION - Use scientific names of plants.

Line Stratum (Plot size: <u>30 ft.</u> ;	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>None Observed</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
				Prevalence Index Worksheet:
				Total % Cover of: <u> </u> Multiplied by:
				OBL species <u>0</u> x 1 = <u>0</u>
				FACW species <u>0</u> x 2 = <u>0</u>
				FAC species <u>30</u> x 3 = <u>90</u>
				FACU species <u>45</u> x 4 = <u>180</u>
				UPL species <u>0</u> x 5 = <u>0</u>
				Column Totals: <u>75</u> (A); <u>270</u> (B)
				Prevalence Index = B/A = <u>3.60</u>
				Hydrophytic Vegetation Indicators:
				1 - Rapid Test for Hydrophytic Vegetation
				2 - Dominance Test is >50%
				3 - Prevalence Index is >3.0
				4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Probable Hydrophytic Vegetation ¹ (Explain)
				Indicators of hydroic soil and wetland hydrology must be present, unless disturbed or problematic
				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
Remarks: No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indicated as FACU or FAC).				

SOILSampling Point: Observation Point 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Restrictive Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-1	10Yr 4/2	13				Organic Soil Layer ²	Mostly decomposing plant matter
2-4	10Yr 6/2	99	5Yr 6/9	2	N/A	Sandy Loam	Silty clay loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Part Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Hist. Epipedon (A2)	<input type="checkbox"/> Striped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (I 8)
Restrictive Layer (if present):	Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Type: <u>Rock</u>	
Depth (inches): <u>20</u>	
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Remarks: A positive indication of hydric soil was observed.	

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (39) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (39) (MLRA 1, 2, 4A, and 4B)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Waste Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Scum or Voids on Aerial Imagery (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D8) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Irrigation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	
Surface Water Present? Yes <u> </u> No <u>X</u>	Depth (inches): <u>0</u>		
Water Table Present? Yes <u>X</u> No <u> </u>	Depth (inches): <u>2</u>		
Saturation Present? Yes <u>X</u> No <u> </u>	Depth (inches): <u>1</u>		
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: A positive indication of wetland hydrology was observed (at least one primary indicator).			

US Army Corps of Engineers

Western Mountains, Valleys, and Coast Version 2.0

APPENDIX F

U.S. Fish and Wildlife Service Official Species List and State-Listed Special-Status Species List

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
Phone: (505) 346-2525 Fax: (505) 346-2542
<http://www.fws.gov/southwest/es/NewMexico/>
http://www.fws.gov/southwest/es/ES_Lists_Main2.html



In Reply Refer To:
Consultation Code: 02ENNM00-2019-SLI-1128
Event Code: 02ENNM00-2019-E-02379
Project Name: Tererro Project

July 17, 2019

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

To Whom It May Concern:

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

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

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If you determine that your proposed action may affect federally-listed species, consultation with the Service will be necessary. Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

The scope of federally listed species compliance not only includes direct effects, but also any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects that may occur in the action area. The action area includes all areas to be affected, not merely the immediate area involved in the action. Large projects may have effects outside the immediate area to species not listed here that should be addressed. If your action area has suitable habitat for any of the attached species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

Candidate Species and Other Sensitive Species

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

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

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

New Mexico State Forestry. The New Mexico Endangered Plant Program:
www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html

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

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

WETLANDS AND FLOODPLAINS

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

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

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Bird Office. To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern at website www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction.

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at www.fws.gov/midwest/eagle/guidelines/bgepa.html.

On our web site www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm, we have included conservation measures that can minimize impacts to federally listed and other sensitive species. These include measures for communication towers, power line safety for raptors, road and highway improvements, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

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

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Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please call 505-346-2525 or email nmesfo@fws.gov and reference your Service Consultation Tracking Number.

Attachment(s):

- Official Species List
- Migratory Birds

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Official Species List

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

This species list is provided by:

New Mexico Ecological Services Field Office
2105 Osuna Road Ne
Albuquerque, NM 87113-1001
(505) 346-2525

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Project Summary

Consultation Code: 02ENNM00-2019-SLI-1128

Event Code: 02ENNM00-2019-E-02379

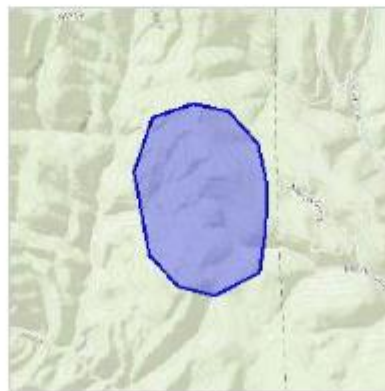
Project Name: Tererro Project

Project Type: MINING

Project Description: Comexico LLC submitted an Exploration Permit Application to the State of New Mexico Energy, Minerals and Natural Resources Department and a Plan of Operations to the United States Department of Agriculture, Santa Fe Forest on June 3, 2019. The proposed activities include up to 30 boreholes via diamond drilling and/or reverse circulation drilling to determine the mineral deposit containing copper, gold, zinc, lead, and silver. We have proposed exploratory drill holes to confirm the deposits existence and to explore the known deposit's extents. The project activities are within the north half of Section 1, Township 17 North, Range 11 East. The proposed disturbance will be limited to areas of existing roads and/or former disturbance. The approximate area proposed to station a drill rig upon a borehole location is 50 ft by 30 ft (diamond drill) or 60 ft by 40 ft (reverse circulation drill). Drilling operations are proposed to begin in October, 2019 and be completed prior to the end of February, 2020.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/35.72843272645374N105.72900556482793W>



Counties: Santa Fe, NM

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Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

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

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

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

Mammals

NAME	STATUS
New Mexico Meadow Jumping Mouse <i>Zapus hudsonius luteus</i>	Endangered
There is final critical habitat for this species. Your location is outside the critical habitat. This species only needs to be considered under the following conditions:	
<ul style="list-style-type: none"> If project affects dense herbaceous riparian vegetation along waterways (stream, seep, canal/ditch). 	
Species profile: https://ecos.fws.gov/ecp/species/7965	

Birds

NAME	STATUS
Mexican Spotted Owl <i>Strix occidentalis lucida</i>	Threatened
There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i>	Endangered
There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	

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Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Mexican Spotted Owl <i>Strix occidentalis lucida</i> https://ecos.fws.gov/ecp/species/8196/crit/hab	Final

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Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Grace's Warbler <i>Dendroica graciae</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 20 to Jul 20
Rufous Hummingbird <i>selasphorus rufus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere

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NAME	BREEDING SEASON
Virginia's Warbler <i>Vermivora virginiae</i>	Breeds May 1 to Jul
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	31
https://ecos.fws.gov/ecp/species/9441	

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

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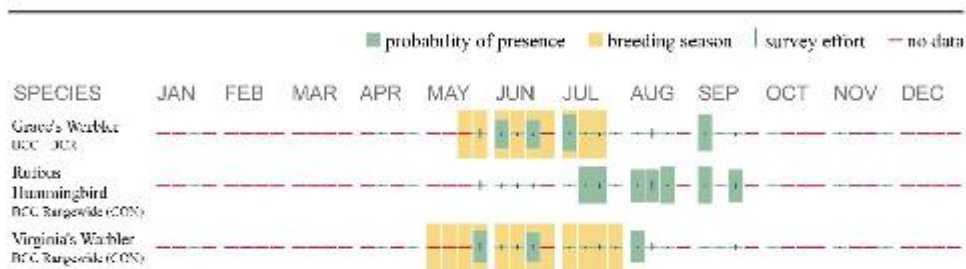
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or

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[permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In

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contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.



Federal or State Threatened/Endangered Species San Miguel, Santa Fe

<u>Taxonomic Group</u>	<u># Species</u>	<u>Taxonomic Group</u>	<u># Species</u>
Birds	15	Fish	2
Mammals	3	Molluscs	4

TOTAL SPECIES: 24

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGE</u>	<u>US FWS</u>	<u>Critical Habitat</u>	<u>SGCN</u>	<u>Photo</u>
Spotted Bat	Eudernia maculatum	T			Y	View
Pacific Marten	Martes caurina	T			Y	View
Meadow Jumping Mouse	Zapus luteus luteus	E	E	Y	Y	View
White-tailed Ptarmigan	Lagopus leucura	E			Y	View
Yellow-billed Cuckoo (western pop.)	Coccyzus americanus occidentalis		T		Y	View
Broad-billed Hummingbird	Cynanthus latirostris	T			Y	View
Violet-crowned Hummingbird	Amazilia violiceps	T			Y	View
White-eared Hummingbird	Hylocharis leucotis	T				View
Least Tern	Sterna antillarum	E	E		Y	View
Brown Pelican	Pelecanus occidentalis	E				View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Common Black Hawk	Buteo galus anthracinus	T			Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Boreal Owl	Aegolius funereus	I			Y	View
Peregrine Falcon	Falco peregrinus	T			Y	View
South-western Willow Flycatcher	Empidonax traillii eximius	E	E	Y	Y	View
Gray Vireo	Vireo vicinior	I			Y	View
Baird's Sparrow	Centronyx bairdii	T			Y	View
Arkansas River Shiner (Native pop.)	Notropis girardi	E	T	Y	Y	No Photo
Suckermouth Minnow	Phenacobius mirabilis	I			Y	View
Paper Pondshell	Utterbackia imbecillis	E			Y	View
Lilljeborg's Peaclam	Pisidium lilljeborgi	T			Y	No Photo
Lake Fingernailclam	Musculium locustre	I			Y	View
Long Fingernailclam	Musculium transversum	T			Y	View

8/19/2019

(E=Endangered, T=Threatened)

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