

Biological Assessment/ Biological Evaluation Yankee Canyon Coal Mine Safeguarding Project Colfax County, New Mexico

Prepared for

New Mexico Energy, Minerals, and
Natural Resources Department
Abandoned Mine Land Program

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1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this biological assessment/biological evaluation (BA/BE) to assess the effects of the proposed Yankee Canyon Coal Mine Safeguarding Project (Proposed Action) on state and federal protected natural resources. The Proposed Action is located on the east and south facing slopes of Horse Mesa down to Yankee Canyon (Project Area) within Colfax County, approximately 6 miles northeast of the Town of Raton, New Mexico (USGS Yankee 7.5-minute quadrangle, in Township 31 and 32 N, Range 25 E) (Figures 1 and 2). The Proposed Action is to be undertaken to mitigate historical coal mining within the boundaries of the Project Area. The proposed area of potential effect (APE) consists of approximately 580 total acres, including approximately 300 acres of private land and approximately 280 acres of land administered by the New Mexico State Land Office (SLO). The Proposed Action involves measures to repair the area around County Road A-25 where a section of the road is collapsing due to mine features. Additional measures include stabilization of steep slopes on coal gob piles and safeguarding of other hazardous abandoned mine features such as adits and entryways.

Section 7(a)(1) of the Endangered Species Act (ESA) directs all federal agencies to carry out programs for the conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any threatened, endangered, or proposed species or to adversely modify critical habitat. This BA/BE documents the potential effects of the Proposed Action on federally listed endangered and threatened species that have the potential to occur locally, together with critical habitat for any of these species. It also helps fulfill requirements set forth under the State of New Mexico's Wildlife Conservation Act [17-2-37 NMSA 1978]. Under the Wildlife Conservation Act, it is unlawful to "take" species determined to be endangered within the state as set forth by regulations of the State Game Commission. From Section 3(18) of the ESA, the term "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." As used in the Wildlife Conservation Act [17-2-37 to 17-2-46 NMSA 1978], "take" or "taking" means to harass, hunt, capture, or kill any wildlife or attempt to do so.

2. Project Description

2.1 Background

Enacted on May 2, 1977 (amended in 2006), the Surface Mining Control and Reclamation Act (SMCRA) created the nationwide Abandoned Mine Land Reclamation (AML) Program. It places fees on active coal mines to fund the reclamation of coal mines abandoned before 1977. The Office of Surface Mining Reclamation and Enforcement (OSMRE) distributes funds to the state and tribal abandoned mine land programs, which rank abandoned mine land problems on a priority scale of 1 to 3 as defined by federal law. High priority reflects the degree of need for the protection of public health, safety, and property from the adverse effects of coal mining practices prior to 1977, including restoration of land, water, and the environment. The funds are also allowed for safety closures of mine sites other than coal mines if they have been determined to be a public safety hazard.

Mining was first conducted around Yankee Canyon, as well as the nearby Sugarite Canyon, in the early 1890s. Mining operations continued for over 40 years until the early 1940s, when mining was shut down in the area.

County Road A-25 traverses the slopes from the bottom of Yankee Canyon to the top of Horse Mesa, through the Project Area. The unpaved road appears to be experiencing a loss of bearing capacity due to historical mining activity in the area. Based on evidence of subsidence observed in the road, the Colfax County Road Department has temporarily closed the road due to dangerous, unstable conditions for vehicle passage in this area.

No previous mine reclamation or safeguarding measures have been completed in the Project Area.

2.2 Project Description

The Proposed Action is designed to investigate and repair areas adjacent to County Road A-25 where subsidence features (tension cracks) have been identified along a section of the road. Geotechnical drilling will be performed to characterize subsurface conditions to determine if the subsidence is related to underground mine workings. The scope of work also includes safeguarding of other related hazardous mine openings and features identified throughout the Project Area (Figure 3), while allowing for open access and continued use of the mine features

by smaller wildlife species, including bats. The following safeguarding measures are being evaluated for implementation in priority areas:

- *County Road A-25*: Geotechnical exploration and backfilling through drilling and injection of a water, sand and cement grout mixture are proposed to mitigate subsidence impacting the road. Grout would be injected into the voids beneath and adjacent to the A-25 alignment. The grouting work may take place concurrently with the drilling investigation. The goal of drilling and grouting the County Road A-25 subsidence features is to map the voids under and near the road alignment and to fill those voids with grout to stop additional subsidence in the area and stabilize the road. The drill holes would be spaced every 30 feet along the A-25 alignment, with an increased drilling density of every 20 feet around the existing subsidence features (Trihydro, 2023).
- *Gates*: Gates would be installed over mine shafts and in mine adits or portals, as well as in other mine entryways where gates are determined to be the best method for blocking access to mine features. The gates would be designed in accordance with the latest industry standards and would be modified as necessary to fit the specific entryway, occasionally using steel culverts to support the gate. The basic gate design generally used consists of a vertical to horizontally placed flat grid of welded steel cross bars anchored in place over the mine entryway. The cross bars are oriented horizontally and welded onto vertical supports spaced widely. Spacing of the horizontal cross bars would be 6 inches, designed to allow passage of bats in flight, as well as access for other small mammals and for birds, but not spaced widely enough to allow human entry. Gates are typically constructed of 2-inch by 4-inch and 2-inch-square tubular weathering steel that is anchored into the surrounding rock using 1-inch steel rods. Gates are designed to not inhibit air flow into or out of the mine feature and constructed of angled steel oriented with the apex up to maximize the airflow through the gate (Fant et al., 2009; BCI, 2021).

The gates would be installed at all features identified for closure and surveyed by Bat Conservation International (BCI) and following recommendations provided in BCI's 2021 report conducted for the Project Area (BCI, 2021). Additional features may also be identified for safeguarding based on the results of an extensive cultural resources survey completed for the Project Area (Okun, 2023). Construction timing would be in accordance with the recommendations of the BCI report and any recommendations resulting from surveys of the Project Area performed for this BA/BE. Pre-construction wildlife surveys will also be performed as necessary prior to any destructive closures or the installation of safeguarding measures to inspect for wildlife usage of features prior to closure. In addition, on some adit

and shaft openings within the open slopes of the Project Area, gates constructed and anchored as described above would be installed.

- *Rock/concrete bulkhead with culvert gate:* At some locations, gates would consist of a bulkhead constructed of a 2- to 4-foot-thick section of rocks cemented together with concrete. A 3- to 4-foot steel culvert with a steel gate would be constructed inside.
- *Cupolas:* Cupolas are a type of gate designed to fit over a vertical mine shaft. Bat-friendly cupolas may be installed over mine shafts if determined to be an appropriate measure for safeguarding a feature in the Project Area. Locations and construction timing would be in accordance with the recommendations of the bat report by BCI (2021) and based on pre-construction surveys of wildlife usage of features.
- *Backfill:* Mine openings may be backfilled with adjacent coal gob or waste rock piles.
- *Other structural closures:* Polyurethane foam (PUF) plugs, gated culverts, and other structures may be used to safeguard mine openings.
- *Coal Gob Pile Reclamation:* Stabilization of steep slopes on coal gob piles to prevent mine waste from entering adjacent ephemeral channels. Proposed work may include in situ burial of coal gob or the establishment of vegetation and installation of various erosion control structures on the gob piles as necessary to facilitate effective stormwater management.

The Proposed Project ground disturbance footprint would be focused on the identified hazardous mine features throughout the Project Area (Figure 3). Colfax County Roads A-25 and A-26 would serve as the main access roads, along with former two-track, unpaved mine roads that would serve as access for geotechnical drilling activities and to access other areas situated away from the county roads. Existing disturbed and flat areas adjacent to the road may also be used for geotechnical drilling activities and staging of drilling, construction equipment and materials.

Implementation of the Proposed Action is anticipated to begin at the earliest in fall 2023.

3. Action Area

50 CFR 402 establishes the procedural regulations governing interagency cooperation under Section 7 of the ESA. For species listed under the ESA, the impact analysis must be conducted within the so-called Action Area, defined as all areas that may be affected directly or indirectly

by the Proposed Action. This report provides analyses of the environmental baseline and likely impacts from the Proposed Action in the Action Area.

The delineation of the Action Area for this project is primarily based on expected noise from construction. The Action Area includes an approximate 200-foot buffer around the project area where ground disturbance would occur.

4. Environmental Baseline

On October 6 and 7, 2022, three DBS&A biologists conducted a pedestrian survey for mapping and documentation of ecosystem types and sensitive resources (e.g., wetlands) in the Project Area (Figure 4); as well as evaluating habitat for federal and state listed species. The survey was conducted with a special focus on mine features and the surrounding habitat within the 580-acre Yankee Canyon Project Area. The Project Area boundaries provided by the AML Program were used for general orientation. Prior to the biological survey, old mining roads were mapped using filtering features on a geographic information system (GIS) mapping program and were used for pedestrian access. County Road A-25 divides the northern and southern parcels and the road was used to access the historical mine roads. Fieldwork consisted of the following specific tasks:

- A general botanical survey with an inventory of important or sensitive plant species or plant communities (e.g., milkweed colonies)
- Documentation and mapping of noxious weed infestations
- Documentation of all evidence (e.g., nests) of fauna or observed fauna (including raptors and statutory migratory birds) encountered during fieldwork (notes and photographs)
- Evaluation of habitat types and wildlife corridors to determine the potential for special-status species to occur locally.

Surrounding areas within line of sight were visually inspected using binoculars for the presence of birds, their nests, or past signs of use (e.g., whitewash) within a 200-foot buffer of mine features within the Project Area. Photographs taken during the field survey are provided in Appendix A.

4.1 Soils and Topography

The Project Area lies along the east and south-facing slopes below Horse Mesa at elevations that range from approximately 8,100 feet above mean sea level (feet msl) to 7,150 feet msl. The slopes are generally steep and rugged. The area is within unconsolidated landslide deposits and colluvium.

Soils other than the mined areas are almost exclusively Aridic Argiustolls-Rock outcrop association, and are found on the side slopes of mesas at elevations from 6,000 to 10,500 feet msl (NRCS, 2022) (Figure 5). Aridic Argiustoll, approximately 80 percent of the association, is a colluvium derived from igneous and sedimentary rock and/or residuum weathered from igneous and sedimentary rock. The typical profile is comprised of very flaggy loam from 0 to 23 inches and very flaggy clay loam from 23 to 40 inches, with clay loam beyond.

4.2 Groundwater

Groundwater levels around the area of the Proposed Action will generally match the topography, ranging from a shallow depth at the tributaries to Yankee Canyon to depths of several hundred feet outside of the drainages on the slopes and up to the top of Horse Mesa. Regional groundwater flow is to the southeast toward the East Fork of Chicorica Creek, the main east to west creek in Yankee Canyon and paralleling NM Highway 72.

4.3 Surface Water

There are no surface waters, wetlands, or riparian areas within the Project Area with the exception of a small 3-foot by 6-foot area. A pipe that protrudes from the canyon slope of the drainage in the southern parcel of the Proposed Action was observed to be dripping, and has created a wet area with a very small amount of surface water and mud that flows to the bottom of the drainage, a distance of approximately 30 feet. There are ephemeral drainages that carry stormwater runoff from the mesa top to the main tributary of the East Fork of Chicorica Creek in Yankee Canyon below.

4.4 Vegetation Communities

The Proposed Action is located on the eastern and southeastern slopes and associated ephemeral drainages of Horse Mesa. The most prevalent ecoregion overlapping the mesa slopes is classified as Rocky Mountain Gambel Oak-Mixed Montane Shrubland (USGS, 2004) (Figure 4). This ecological system occurs in the mountains, plateaus and foothills of the

southern Rocky Mountains and Colorado Plateau. These shrublands are most commonly found along dry foothills, lower mountain slopes, and at the edge of the western Great Plains from 6,560 to 9,510 feet msl, and are often situated above pinyon-juniper woodlands. Substrates are variable and include soil types ranging from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel. The vegetation is typically dominated by Gambel's oak alone or codominant with western serviceberry (*Amelanchier alnifolia*), Utah serviceberry (*Amelanchier utahensis*), big sagebrush (*Artemisia tridentata*), mountain mahogany (*Cercocarpus montanus*), chokecherry (*Prunus virginiana*), Stansbury cliffrose (*Purshia stansburiana*), bitterbrush (*Purshia tridentata*), New Mexico locust (*Robinia neomexicana*), mountain snowberry (*Symphoricarpos oreophilus*), or roundleaf snowberry (*Symphoricarpos rotundifolius*). There may be inclusions of other mesic montane shrublands with Gambel's oak absent or as a relatively minor component. This ecological system intergrades with lower montane-foothills shrubland systems and shares many of the same site characteristics. Density and cover of Gambel's oak and serviceberry species often increase after fire (NatureServe, 2022).

Scattered throughout the area is Southern Rocky Mountain Ponderosa Pine Woodland, primarily on the less prevalent north-facing aspects of the area. This ecoregion is a widespread foothill and montane forest, woodland and savanna group that typically occurs at the lower treeline, with grasslands or shrublands below and relatively mesic forests above. Sites are typically warm, dry, and exposed, ranging from 5,580 to 9,515 feet msl extending down to 5,000 feet msl in its northern extent. Stands occur on a variety of landforms including bottomlands, elevated plains, cinder cones, piedmont slopes, mesas, foothills, and mountains. The ecoregion can occur on all slopes and aspects, but if it occurs on south- or west-facing slopes, it is typically only at higher elevations. This group is dominated by ponderosa pine (*Pinus ponderosa*) with many possible tree canopy associates depending on location, including white fir (*Abies concolor*), juniper (*Juniperus* spp.), pinyon pine (*Pinus edulis*), limber pine (*Pinus flexilis*), quaking aspen (*Populus tremuloides*), and Douglas fir (*Pseudotsuga menziesii*).

Also on north-facing aspects and near the drainages of the southern parcel is Southern Rocky Mountain Montane Subalpine Grassland. This ecosystem is the prevalent classification for the top of Horse Mesa; however, there are reaches that extend into the Project Area. This ecosystem typically occurs between 7,217 and 9,842 feet msl on flat to rolling plains and parks or on lower side slopes that are dry, but it may extend up to 10,990 feet msl on warm aspects. An occurrence usually consists of a mosaic of two or three plant associations with one of the following dominant bunchgrasses: oatgrass (*Danthonia intermedia*), Parry's oatgrass (*Danthonia*

parryi), Idaho fescue (*Festuca idahoensis*), Arizona fescue (*Festuca arizonica*), Thurber's fescue (*Festuca thurberi*), and Muhly (*Muhlenbergia filiculmis*). The subdominants include blue grama (*Bouteloua gracilis*) and pine bluegrass (*Poa secunda*). These large-patch grasslands are intermixed with matrix stands of spruce-fir, lodgepole pine, ponderosa pine, and aspen forests (NatureServe, 2022).

A few scattered reaches, primarily in the lower elevations of the area, consist of Southern Rocky Mountain Pinyon Juniper Woodland. This pinyon-juniper woodland group occurs in the southern Rocky Mountains on dry mountains and foothills primarily in southern Colorado east of the Continental Divide, and is characterized by pinyon pine that dominates or co-dominates the tree canopy with one-seed juniper (*Juniperus monosperma*).

The vegetation communities of the Project Area have been altered by the Track Fire that burned through the area in 2011. Much of the region that was formerly a mosaic of ponderosa pine, mixed conifer forest and oak shrubland is now covered almost exclusively by Gambel's oak shrub on the side slopes of the mesa. Mixed conifer forest persists only in pockets and in the two large drainages of the area that were largely unaffected by the fire. In addition to Gambel's oak, New Mexico locust is common throughout the burned area, as is mountain mahogany.

A list of plants recorded during the biological survey is provided in Table 1. No plants on the lists of sensitive species were observed during the site survey (NMEMNRD, 2022; NMRPTC, 2022).

4.5 Noxious Weeds

The U.S. Department of Agriculture's (USDA's) most updated federal noxious weed list, the 2016 New Mexico noxious weed list (Class A, Class B, and Class C species) (NMDA, 2016), and watch lists were all reviewed to determine the current status of noxious weeds and their potential for local occurrence.

Noxious weeds were observed during the biological survey on October 6 and 7, 2022. One Siberian elm (*Ulmus pumila*), a Class C species, was observed at a gob pile at the southern end of the northern parcel. The elm was in an area that could have safety measures taken as part of the Proposed Action.

4.6 Wildlife

The Project Area and Action Area harbor species adapted to higher elevation montane and oak shrubland habitats. Table 2 lists all of the species recorded during the October 6 and 7, 2022 biological survey.

The following subsections describe species known to be present and/or observed during the field survey.

4.6.1 Invertebrates

Among the invertebrates documented during the survey were the lubber grasshopper (*Romalea* sp.), the clouded sulphur butterfly (*Colias philodice*), and the blue fungus beetle (*Cypherotylus californicus*).

4.6.2 Fish

There were no surface waters (and therefore no fish) within the Project Area.

4.6.3 Amphibians and Reptiles

No amphibians were recorded in the Project Area, but reptiles were observed including the prairie lizard (*Sceloporus undulatus*) and short-horned lizard (*Phrynosoma douglash*).

4.6.4 Birds

A total of 20 bird species were documented during the survey. Townsend's solitaires (*Myadestes townsendi*), spotted towhees (*Pipilo maculatus*), and American robins (*Turdus migratorius*) were commonly heard or seen throughout the survey area. Other common birds in the area included the common raven (*Corvus corax*), Woodhouse's scrub jay (*Aphelocoma woodhouseii*), Steller's jay (*Cyanocitta stelleri macrolopha*), mountain chickadee (*Poecile gambeli*) and black-capped chickadee (*Poecile atricapillus*).

4.6.5 Mammals

Evidence of mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis nelsoni*), and black bear (*Ursus americanus*) presence was observed throughout the Project Area. Other mammals including northern pocket gopher (*Thomomys talpoides*) and domestic cow (*Bos taurus*) appeared to be common throughout the area as evidenced by burrows, tracks, or scat. A rock squirrel (*Otospermophilus variegatus*) was observed in the bottom of the main canyon near a dirt

access road in an area where dumped trash was noted. It appeared that many of the larger mammals such as black bears, cows, and elk use the network of old mining roads that lead to local gob piles. These roads likely enable larger mammals to travel more easily by avoiding the dense oak brush that cover the slopes.

The AML Program commissioned a separate survey conducted in mines of Yankee Canyon to assess bat habitat and provide closure recommendations. The survey conducted by BCI resulted in bat surveys on two distinct features comprising two openings to the surface (BCI, 2021). Three hibernating Townsend's big-eared bats (*Corynorhinus townsendii*) were observed in Yankee Adit 1, located in the southern portion of the northern parcel (BCI, 2021).

5. Species/Critical Habitat Considered

This section evaluates the potential for listed species to occur in the Project Area or Action Area and be affected by the Proposed Action. For federally listed species, the Information, Planning, and Consultation System (IPaC) planning tool from the U.S. Fish and Wildlife Service (USFWS) (New Mexico) was used to obtain information on biological resources of the area (USFWS, 2022) (Appendix B). The state (animal) species list was obtained for Colfax County from the New Mexico Department of Game and Fish (NMDGF) Biota Information System of New Mexico (BISON-M) website (NMDGF, 2022) (Appendix B). The project was also submitted to the New Mexico Environmental Review Tool (NMERT), a tool used for conservation planning and review of important resources for wildlife and habitats (NMERT, 2022). The state endangered plant species list for Colfax County was obtained from the NMEMNRD and the New Mexico Rare Plants Database.

5.1 Federal Threatened and Endangered Species

The IPaC report obtained for this project lists a total of 6 federal threatened, endangered, and proposed species, with no designated or proposed critical habitat for the Project Area (USFWS, 2022) (Appendix B).

Of the 6 species, none have the potential to occur in the Project Area. Table 3 contains habitat descriptions for all 6 federal listed species and determination on their potential for occurrence in the Project Area and/or Action Area. No effect determination and no Section 7 consultation are needed.

5.2 State-Listed and other Special-Status Species

The list of Colfax County's state threatened or endangered species was also reviewed as part of this evaluation (Appendix C). It consists of 2 fish, 2 mollusks, 11 birds, and 3 mammals, for a total of 18 species. Table 4 provides habitat descriptions for these species and an assessment of their potential for occurrence in the Project Area. None of the 18 species are likely to occur in the Project Area.

No state-listed species were observed during the biological survey on October 6 and 7, 2022 (Table 2).

Important plant areas (IPAs) are specific places in New Mexico that support either a high diversity of sensitive plant species or are the last remaining locations of the state's most endangered plants (NMEMRND, 2017). IPAs and their biodiversity rank were reviewed for the project footprint, and it was determined that there are no IPAs present in the region of Yankee Canyon (NMEMRND, 2017). The nearest IPA is a narrow band of land of approximately 3,621 acres that reaches from Raton east to Sugarite Canyon, beyond the Project Area to the west, and is associated with the Spiny Aster (*Eurybia horrida*).

No state endangered plant species are located within Colfax County (NMEMNRD, 2022) (Table 4). In addition to reviewing state-listed species, DBS&A reviewed the New Mexico Rare Plant Conservation Scorecard (scorecard) for the Project Area. The scorecard provides an analysis of the current conservation status of the 235 strategy rare plants, including threats, degree of protection, and actions needed to conserve species (management actions, inventories, monitoring, taxonomic work, etc.) (NMNHP, 2022). Two rare plant species, New Mexico stickseed (*Hackelia hirsuta*) and spiny aster (*Eurybia horrida*) were determined as having a low potential to occur in the Project Area. New Mexico stickseed is found on dry sites of shaley or igneous soils in lower to upper montane coniferous forest, usually with Gambel oak at 7,700 to 10,200 feet msl. The species often occupies roadcuts or excavations that expose mineral soils. It is not significantly threatened by common land uses within its habitat (NMRP, 2022). The spiny aster is found on sandy shales on mountain and canyon slopes, from upper montane conifer forest down to juniper savanna, often associated with oak scrub at elevations ranging from 4,100 to 10,700 feet msl. This species shows ecological adaptability as it occurs on both dry, south-facing slopes in high mountains and shaded, north-facing slopes at low elevations. This plant is sporadically distributed, but not infrequent within the Canadian River Basin of New Mexico (NMRP, 2022). Table 4 lists Colfax County's state endangered and New Mexico rare

plant species, together with a description of their habitats and their potential for occurrence in the Project Area.

Table 1 provides a list of all plant species observed during the biological survey. No special-status species were observed during the biological survey on October 6 and 7, 2022.

6. Listed Species and Critical Habitat Analysis

6.1 Species Listings

This section evaluates the potential for listed species to occur in the Project Area or Action Area and potentially be affected by the Proposed Action. The IPaC planning tool from the USFWS (New Mexico) was used to obtain information on biological resources of the area (Appendix B). The NMDGF list of state-listed species for Colfax County as accessed from the Biota Information System of New Mexico (BISON-M) website was also reviewed as part of the evaluation (Appendix C). In addition, the New Mexico state endangered plant list (NMEMNRD, 2022) and the USDA noxious weed list (NRCS, 2022) were obtained online and reviewed. Recommendations from the tool are incorporated as appropriate. The following subsections summarize the results of these queries.

6.1.1 U.S. Fish and Wildlife Service

The IPaC report obtained for this project listed a total of 6 federal threatened, endangered, or proposed species, with no designated critical habitat within the Project Area.

6.1.2 New Mexico Department of Game and Fish

The list of state-listed species in Colfax County was obtained from the NMDGF website (NMDGF, 2022). A total of 18 state endangered or threatened species have the potential to occur in Colfax County, New Mexico (Appendix C).

6.1.3 New Mexico Endangered Plants

The New Mexico state endangered plant list was reviewed for Colfax County (NMEMNR, 2022). No state endangered plants are listed for the county. In addition, the list of rare plant species in Colfax County was obtained from the NMRPTC website (NMRPTC, 2022). A total of 10 (including state endangered) rare plant species have the potential to occur in the county.

Two rare plant species were determined to have a low potential to occur in the Project Area; however, neither one was observed during the biological survey.

6.2 Critical Habitat Analysis

The Project Area was determined to not be located within any designated or proposed critical habitat (USFWS, 2022c). The nearest critical habitat is for the New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), located within Sugarite Canyon, approximately 2.5 miles west of the Proposed Action.

6.3 Listed Species Eliminated from Further Consideration

Table 3 summarizes the findings for federally listed species that have been removed from further evaluation because suitable habitat is not present within the Project Area and Action Area. Table 4 summarizes the findings for state-listed species that have been removed from further evaluation because suitable habitat is not present within the Project Area.

6.4 Listed Species Evaluated Further

No federally listed threatened or endangered species have been determined to have the potential to occur in the Project Area and/or the Action Area.

One federal candidate species, the monarch butterfly (*Danaus plexippus*), was determined to have a low potential to occur in the Project Area. Adult monarch butterflies require a diversity of blooming nectar resources during breeding and migration, which they feed on along their migration routes and on breeding grounds (spring through fall). Monarchs also need milkweed (for both oviposition and larval feeding) embedded within their diverse nectaring habitat. The correct phenology, or timing, in the life cycle of monarchs and blooming of nectar plants and milkweed is important for monarch survival. There are two migrating populations, eastern and western. New Mexico contains spring breeding areas primarily in the eastern one-third of the state (USFWS 2020). There is therefore a low potential for the monarch butterfly to occur within the Project Area and/or Action Area. Yankee Canyon is located within the eastern third of the state where spring breeding areas have been documented. However, the potential for milkweed plant species to be present is low. No milkweed was observed during the site survey.

6.5 Other Wildlife

The NMDGF Environmental Review Tool (ERT) was used by defining the project scope and the Project Area to generate a report for recommendations by the NMDGF (NMDGF, 2022). The ERT provides an initial list of recommendations regarding potential impacts to wildlife or wildlife habitats from the proposed project, and is a preliminary environmental screening assessment tool only, used in conjunction with findings from the biological survey and other evaluation tools. The ERT stated the following:

[The] proposed project occurs within an area where springs or other important natural water features occur. This may result in the presence of a high use area for wildlife relative to the surrounding landscape. To ensure continued function of these important wildlife habitats, [the] project should consider measures to avoid the following.

- Altering surface or groundwater flow or hydrology,
- Disturbance to soil that modifies geomorphic properties or facilitates invasion of non-native vegetation. Affecting local surface or groundwater quality.

Creating disturbance to wildlife utilizing these water features. Disturbance to wildlife can be reduced through practices including clustering infrastructure and activity wherever possible, avoiding large visual obstructions around water features, and limiting nighttime project operations or activities.

[The] project occurs within important habitats for wildlife, which could include fawning/calving or wintering areas for species such as deer and elk, or high wildlife movement and activity areas. Management recommendations within these areas may include the following.

- Restrictions on noise-generating activities between December 1 and April 15. These activities would include oil and gas well pad development and operation that exposes wildlife to loud noises (at or above 48.6 dB(A) Leq at 400 feet in any direction from the source) from drilling, compressors, and pumping stations.
- Modifying fences along high use areas to make them wildlife friendly and facilitate large animal movement.
- Taking mitigation actions to reduce wildlife-vehicle collisions at high risk locations.

Short-term direct impacts to wildlife in the Project Area would include noise and ground disturbance during construction; however, no loud noise would occur above 48.6 dB(A), 400 feet from the source. No long-term noise impacts are anticipated.

There was a small area of surface water observed during the survey. It was not determined whether it was a natural spring or sourcing from an adit. This area could be temporarily impacted by noise or nearby ground disturbance during construction; however, no long-term impact to any surface water would occur from the project.

Construction activities would likely result in the direct loss of some smaller, less-mobile species of wildlife, such as small mammals and reptiles, and displacement of more mobile species to adjacent undisturbed habitats until construction activities are completed. The most common wildlife responses to noise and the presence of construction equipment and human presence are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. Overall, avoidance of the Project Area would be relatively short-term and would cease soon after completion of construction activities.

It is very likely that at least some of the adits and other mine features are used by wildlife such as bears in the Project Area. A thorough survey of these mine features would be conducted prior to any disturbance, such as gating of adit openings, in order to ensure that no bears or any other wildlife would be impacted by safeguarding measures. The former mine roads would likely be used for access during construction, and temporary disturbance would occur for wildlife that use the roads.

No long-term detrimental impacts to wildlife are anticipated. Adits that may have been used by denning bears would no longer be accessible; however, there are other natural features throughout the Project Area (trees, large boulders) that could be used for purposes such as denning. The mining roads that exist throughout the Project Area would largely remain in place following construction activities, allowing for wildlife passage corridors to continue.

6.6 Plants

No federally endangered or threatened plant species are listed for the Project Area within Colfax County. No plants are listed as state endangered for Colfax County.

A total of 10 rare plant species have the potential to occur in the Colfax County. Of these, 2 rare plant species were determined to have a low potential to occur in the Project Area: spiny aster (*Eurybia horrida*) and New Mexico stickseed (*Hackelia hirsuta*) (Table 4).

The Project Area contains soils that are very flaggy loam to very flaggy clay loam on steep, 20 to 40 percent slopes. The parent material is colluvium derived from igneous and sedimentary rock and/or residuum weathered from igneous and sedimentary rock. The biological survey focused

especially on areas of proposed disturbance around mine features; the two species were not observed (Table 2).

None of these plant species should be impacted by the Proposed Action even if they were to occur in the Project Area. The biological survey focused especially on areas of proposed disturbance around mine features, and none of these species were documented.

6.7 Cumulative Effects Analysis

As defined under the ESA, "cumulative effects" encompass only effects of future state or private activities reasonably certain to occur within the Project Area. After completion of the Proposed Action, planned future actions may include activities conducted by the County. These activities could include road maintenance or signage, none of which would be expected to impact local plants and wildlife. No additional actions by the AML Program are planned and no cumulative effects to any listed resources are anticipated.

7. Conservation Measures

Although Section 7 consultation is not necessary for the Proposed Action, some conservation measures are recommended to minimize any impacts on wildlife and plants of the Project Area. The following actions are incorporated into the design of the proposed action:

- The existing roads and trails in the Project Area would be used as primary access for all vehicles.
- Secondary access would be limited to the extent possible. Once construction is completed, the disturbed areas would be reseeded with native grass and forb species.
- Existing disturbed and flat areas would be used for construction staging of all equipment and materials. The staging areas would be located on or adjacent to the existing roads and trails.
- Surveys for wildlife usage of mine features such as adits would be conducted prior to installation of safeguarding measures.
- If possible, construction activities should all take place outside of the migratory bird nesting season. If not, a pre-construction nesting survey of the Project Area would be conducted

prior to the commencement of construction. Any active nests found will be flagged for avoidance during construction activities.

8. Conclusions

The Proposed Action is designed to safeguard dangerous mine features located within the Yankee Canyon Mining District. Conservation measures such as using bat-friendly gates as safeguarding mine features, using existing roads during construction, and conducting pre-construction nesting surveys will be implemented as part of the project.

A biological survey was conducted on October 6 and 7, 2022 to observe field conditions, assess the likelihood of occurrence of special-status (including federal threatened and endangered) species, and evaluate potential impacts.

There is no critical habitat within the Project Area, as noted in the USFWS IPaC report generated for this project (Appendix B). This evaluation finds that the project will have no effect on critical habitat.

No federally listed species were determined to have a potential to occur within the Action Area or Project Area. This evaluation finds that the project will have no effect on federally listed species. Informal Section 7 consultation with the USFWS is not necessary. No written concurrence from USFWS is needed.

No state-listed species were determined to have the potential to occur within the Action Area or Project Area. No impact to state-listed species is anticipated as a result of the project.

The work will temporarily disturb vegetation, as well as animal species and their habitats, within the Project Area.

Project impacts to non-listed species would include temporary noise impacts, as well as vegetation removal, elimination of burrows and potential nest sites, and ground disturbance. However, if construction is timed outside of the nesting season, project impacts would be negligible.

Humans can spread the fungus that causes White-Nose Syndrome from one hibernaculum to another by accidentally carrying the fungus on shoes, clothing, or gear. Reduced human access

to any of the mine features that harbor or could harbor bats in the future is an anticipated benefit of the Proposed Action.

With conservation measures implemented, the project impacts listed above would likely be negligible.

9. Contacts Made

No ESA Section 7 consultation is necessary for this project.

10. Preparers

This BA/BE documents the findings from biological surveys conducted on October 6 and 7, 2022 and potential impacts from the proposed Yankee Canyon Coal Mine Safeguarding Project. This BA/BE was prepared by DBS&A biologists Dr. Jean-Luc Cartron and Julie Kutz.

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Figures

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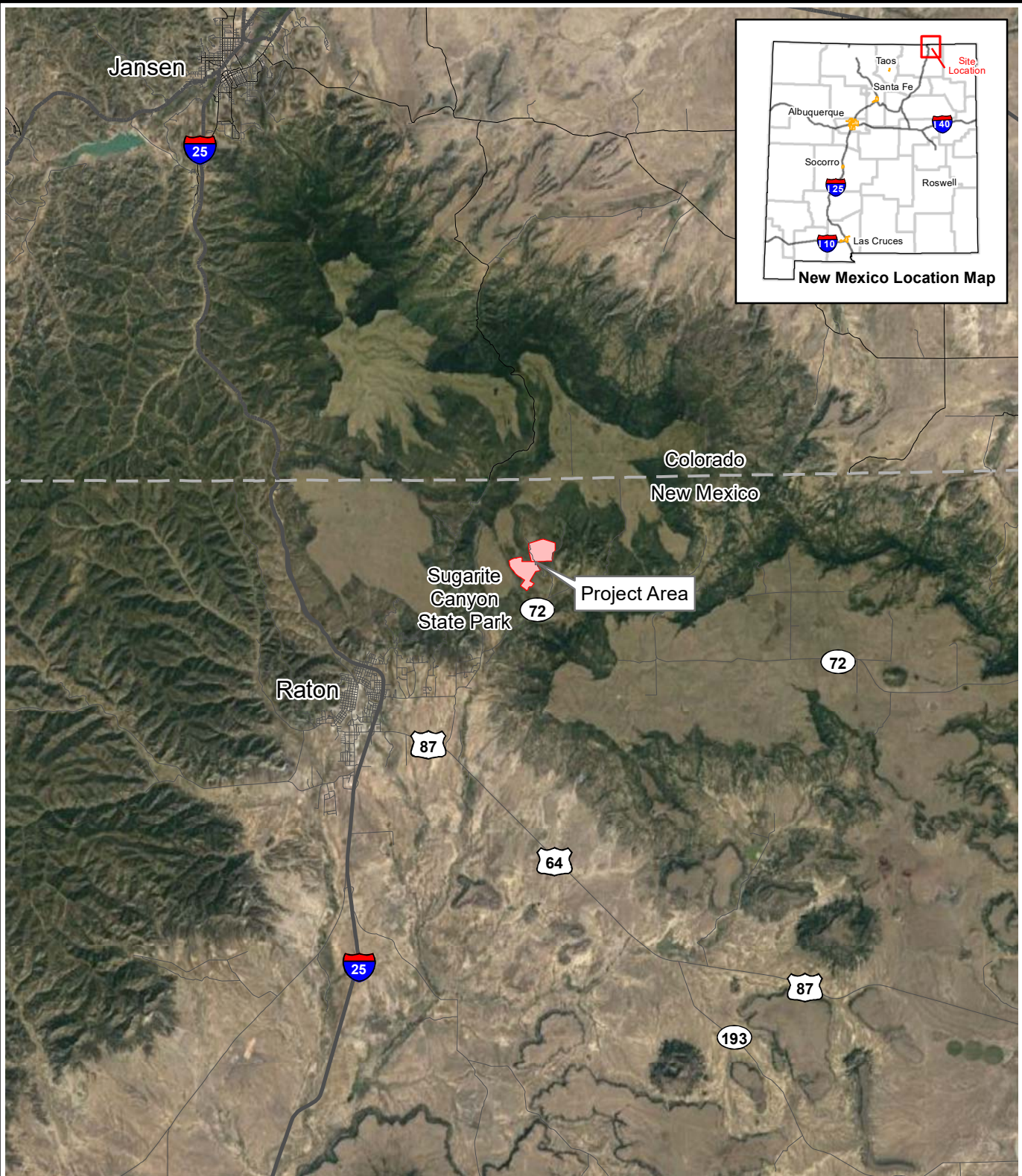
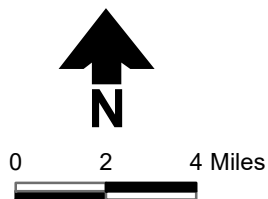
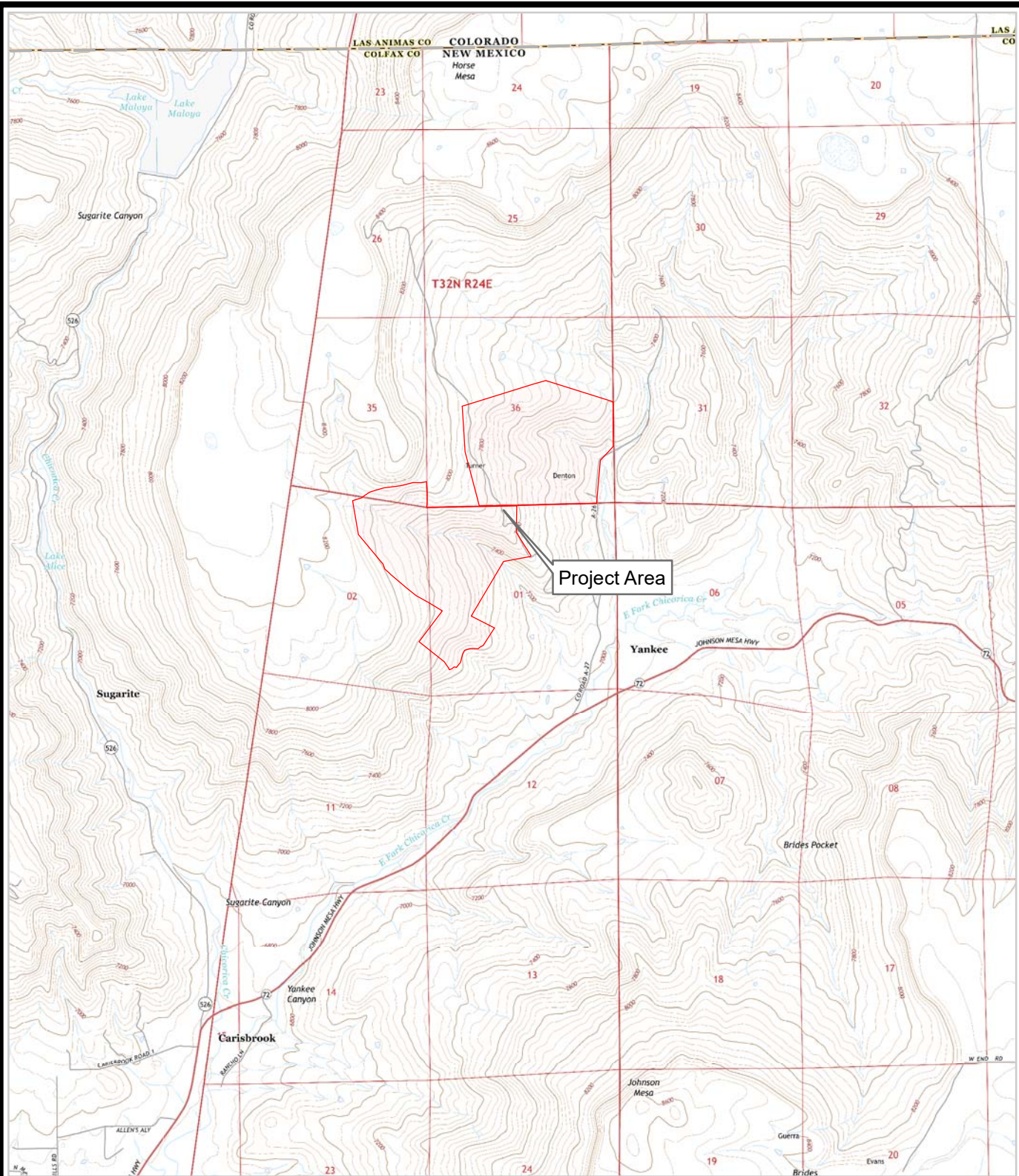
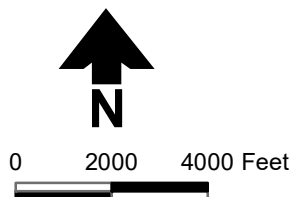


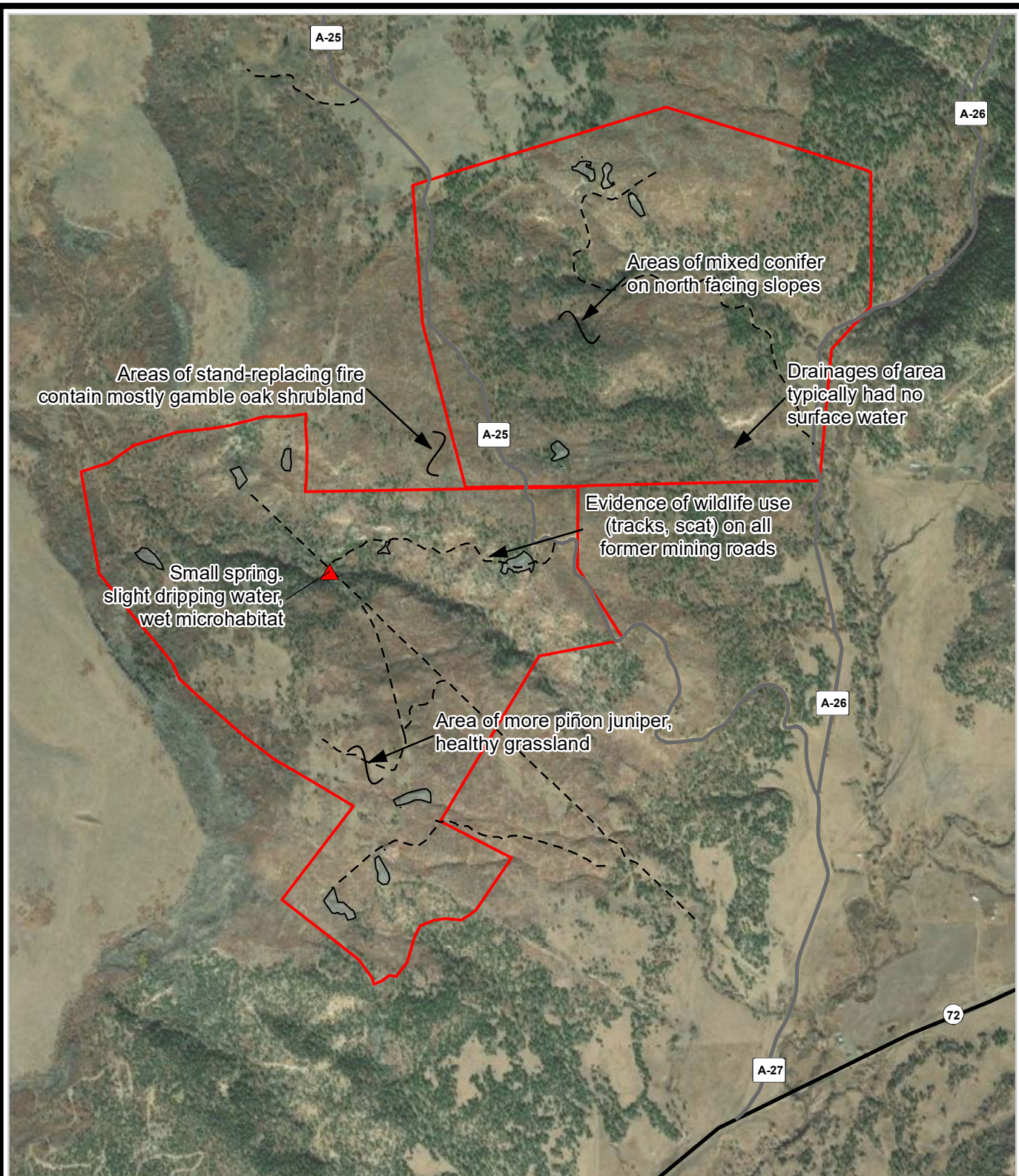
Image source: Google Earth Pro, 5/1/2014



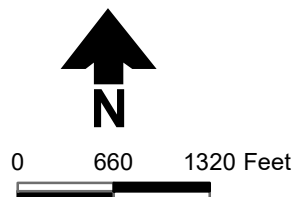


Source: U.S. Geological Survey 7.5 Minute Quadrangle Map
NM Raton, NM Yankee
<http://rgis.unm.edu/Downloaded> 22 September 3033





Source: Maxar, Vivid 11/7/2021



Explanation

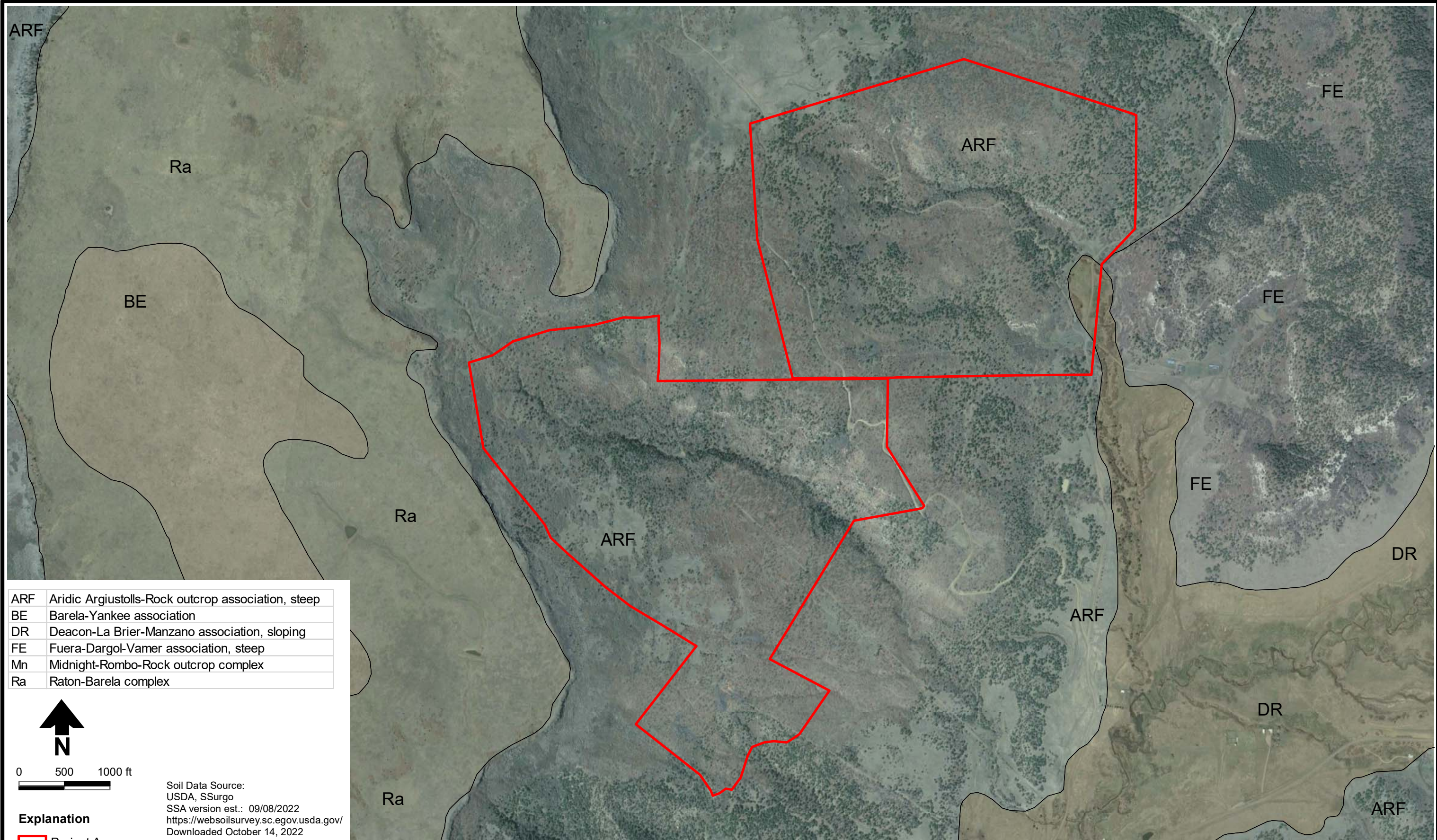
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- Coal gob pile
- Project Area
- Former mining road
- County road
- State road



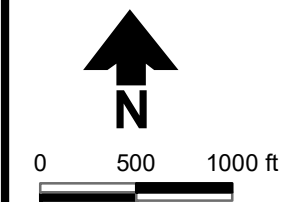
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Figure 4

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ARF	Aridic Argiustolls-Rock outcrop association, steep
BE	Barela-Yankee association
DR	Deacon-La Brier-Manzano association, sloping
FE	Fuera-Dargol-Vamer association, steep
Mn	Midnight-Rombo-Rock outcrop complex
Ra	Raton-Barela complex



Explanation
 Project Area

Soil Data Source:
USDA, SSurgo
SSA version est.: 09/08/2022
<https://websoilsurvey.sc.egov.usda.gov/>
Downloaded October 14, 2022

Tables

Table 1. Flora Observed During Biological Survey
Page 1 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
<i>Trees</i>			
Fagaceae	Gambel oak (<i>Quercus gambelii</i>)	—	Most abundant plant species in the Project Area. Located throughout, mostly on drier slopes, stand-replacing species in burned areas. Also common as a shrub. Large tree stands in main canyon valley, northern parcel.
Fabaceae	New Mexico locust (<i>Robina neomexicana</i>)	—	Abundant. Located throughout; most common in areas with Gambel oak.
Cupressaceae	One-seed juniper (<i>Juniperus monosperma</i>)	—	Common, northern and southern parcels, drier slopes.
	Rocky Mountain juniper (<i>Juniperus scopulorum</i>)	—	Common throughout, northern and southern parcels.
Pinaceae	Ponderosa pine (<i>Pinus ponderosa</i>)	—	Common in unburned areas, uncommon in burned areas throughout northern and southern parcels.
	Douglas fir (<i>Pseudotsuga menziesii</i>)	—	Common primarily on steep, unburned slopes of canyons in northern and southern parcels.
	Pinyon pine (<i>Pinus edulis</i>)	—	Scattered throughout, primarily on drier slopes, unburned areas.
	Blue spruce (<i>Picea pungens</i>)	—	Uncommon, in sheltered canyon bottom, southern parcel.
Ulmaceae	Siberian elm (<i>Ulmus pumila</i>)	C	One tree observed at coal pile located at south end of the northern parcel.
Aceraceae	Rocky Mountain maple (<i>Acer glabrum</i>)	—	Uncommon, in sheltered canyon bottom, southern parcel.
Salicaceae	Narrowleaf cottonwood (<i>Populus angustifolia</i>)	—	Uncommon, in sheltered canyon bottom, upstream of dripping spring in southern parcel.
<i>Shrubs</i>			
Anacardiaceae	Three-leaf sumac (<i>Rhus trilobata</i>)	—	Common throughout northern and southern parcels.
Rosaceae	Mountain mahogany (<i>Cercocarpus ledifolius</i>)	—	Common throughout northern and southern parcels.
	Wild rose (<i>Rosa woodsii</i>)	—	Common in canyons and drainages, both southern and northern parcels.

Table 1. Flora Observed During Biological Survey
Page 2 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
<i>Shrubs (cont.)</i>			
Fagaceae	Shrub live oak (<i>Quercus turbinella</i>)	—	Uncommon, observed in southern parcel.
Chenopodiaceae	Fourwing saltbush (<i>Atriplex canescens</i>)	—	Uncommon, one location observed at coal pile in the southern parcel.
Betulaceae	Thinleaf alder (<i>Alnus incana</i> ssp. <i>tenuifolia</i>)	—	Common in canyons and drainages, both southern and northern parcels.
Caprifoliaceae	Common snowberry (<i>Symphoricarpos rotundifolius</i>)	—	Few observed in canyons and drainages, both southern and northern parcels.
Anacardiaceae	Poison ivy (<i>Toxicodendron rydbergii</i>)	—	Few observed in canyons and drainages, both southern and northern parcels.
Ranunculaceae	Western red columbine (<i>Aquilegia elegantula</i>)	—	Forested slope, northern parcel.
<i>Graminoids</i>			
Poaceae	Blue grama (<i>Bouteloua gracilis</i>)	—	Abundant throughout northern and southern parcels.
	Sideoats grama (<i>Bouteloua curtipendula</i>)	—	Common throughout northern and southern parcels.
	Scribner's needlegrass (<i>Achnatherum scribneri</i>)	—	Common throughout northern and southern parcels.
	Rice grass (<i>Achnatherum hymenoides</i>)	—	Uncommon, observed in southern parcel.
	Nodding brome (<i>Bromus anomalus</i>)	—	Uncommon, observed in southern parcel.
	Purple three-awn (<i>Aristida purpurea</i> var. <i>longiseta</i>)	—	Common throughout northern and southern parcels.
	Little bluestem (<i>Schizachyrium scoparium</i>)	—	Common throughout northern and southern parcels.

Table 1. Flora Observed During Biological Survey
Page 3 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
<i>Graminoids (cont.)</i>			
Poaceae (cont.)	Fescue (<i>Festuca</i> spp.)	—	Common in forested areas and in canyon bottoms of the northern and southern parcels.
	Western wheatgrass (<i>Pascopyrum smithii</i>)	—	Common throughout northern and southern parcels.
	Mountain muhly (<i>Muhlenbergia montana</i>)	—	Common throughout northern and southern parcels.
<i>Forbs</i>			
Asteraceae	Hoary aster (<i>Dieteria canescens</i>)	—	Uncommon, observed in northern parcel.
	Three-nerved daisy (<i>Erigeron subtrinervis</i>)	—	Uncommon, observed in northern parcel.
	Narrow goldenrod (<i>Solidago simplex</i>)	—	Uncommon, primarily observed in canyon bottoms southern and northern parcels.
	Snakeweed (<i>Gutierrezia sarothrae</i>)	—	Common, scattered throughout northern and southern parcels, drier slopes.
	Gumweed (<i>Grindelia hirsutula</i>)	—	Uncommon, northern and southern parcels.
	Wavy-leaved thistle (<i>Cirsium undulatum</i>)	—	Observed in one upland area in the northern parcel.
	Prairie sagewort (<i>Artemisia frigida</i>)	—	Common, northern and southern parcels.
	Yarrow (<i>Achillea millefolium</i>)	—	Common throughout northern and southern parcels.
	Sandsage (<i>Artemisia filifolia</i>)	—	Uncommon, drier and disturbed areas, northern and southern parcels.
Liliaceae	Nodding onion (<i>Allium cernuum</i>)	—	One location, northern parcel.
	Wild iris (<i>Iris missouriensis</i>)	—	Uncommon, canyon bottom, southern parcel.
Convolvulaceae	Field bindweed (<i>Convolvulus arvensis</i>)	—	Uncommon, bottom of main valley of Yankee Canyon

Table 1. Flora Observed During Biological Survey
Page 4 of 4

Family	Common Name/Scientific Name	NM Noxious Weed Class	Abundance/Location
<i>Forbs (cont.)</i>			
Fabaceae	Yellow clover (<i>Melilotus officinalis</i>)	—	Uncommon, southern parcel.
	Spurred lupine (<i>Lupinus caudatus</i> ssp. <i>argophyllus</i>)	—	Uncommon, bottom of main valley of Yankee Canyon.
Scrophulariaceae	Woolly mullein (<i>Verbascum thapsus</i>)	—	Common throughout northern and southern parcels.
Polygonaceae	James' wild buckwheat (<i>Eriogonum jamesii</i>)	—	Common throughout northern and southern parcels.
Amaranthaceae	Lambsquarters (<i>Chenopodium album</i>)	—	Uncommon, northern parcel.
Ranunculaceae	Virgin's bower (<i>Clematis ligusticifolia</i>)	—	Uncommon, valley bottom, southern parcel.
Lamiaceae	Field mint (<i>Mentha arvensis</i>)	—	Uncommon, valley bottom, southern parcel.
Berberidaceae	Creeping Oregon grape (<i>Mahonia repens</i>)	—	Uncommon, valleys and forested slopes, northern and southern parcels.
Cyperaceae	Meadow sedge (<i>Carex microptera</i>)	—	One location at dripping spring, canyon bottom, southern parcel.
<i>Succulents</i>			
Cactaceae	Plains prickly pear (<i>Opuntia polyacantha</i>)	—	Common on drier slopes and meadows, northern and southern parcels.
	Hedgehog (<i>Echinocereus</i> spp.)	—	Uncommon, drier meadows, northern and southern parcels.
Agavaceae	Soapweed yucca (<i>Yucca glauca</i>)	—	Uncommon, drier, south-facing meadows, southern parcel.
	Banana yucca (<i>Yucca baccata</i>)	—	Uncommon, drier, south-facing meadows, southern parcel.

Table 2. Fauna Observed During Biological Survey
Page 1 of 2

Class	Family	Species
Invertebrates	Pieridae	Clouded sulphur butterfly (<i>Colias philodice</i>)
	Nymphalidae	Painted lady butterfly (<i>Vanessa cardui</i>)
	Romaleidae	lubber grasshopper (<i>Romalea sp.</i>)
	Erotylidae	Blue fungus beetle (<i>Cypherotylus californicus</i>)
Reptiles	Phrynosomatidae	Prairie lizard (<i>Sceloporus undulatus</i>)
		Short-horned lizard (<i>Phrynosoma douglash</i>)
Birds	Tyraniidae	Townsend's solitaire (<i>Myadestes townsendi</i>)
		Say's phoebe (<i>Sayornis saya</i>)
	Turdidae	American robin (<i>Turdus migratorius</i>)
		Western bluebird (<i>Sialia mexicana</i>)
	Emberizidae	Spotted towhee (<i>Pipilo maculatus</i>)
		Dark-eyed junco (<i>Junco hyemalis</i>)
	Corvidae	Common raven (<i>Corvus corax</i>)
		Woodhouse's scrub jay (<i>Aphelocoma woodhouseii</i>)
		Steller's jay (<i>Cyanocitta stelleri macrolopha</i>)
		Black-billed magpie (<i>Pica hudsonia</i>)
	Fringillidae	Lesser goldfinch (<i>Spinus psaltria</i>)
	Aegithalidae	American bushtit (<i>Psaltirparus minimus</i>)
	Picidae	Northern flicker (<i>Colaptes auratus</i>)
		Downy woodpecker (<i>Picoides pubescens</i>)
	Sittidae	White-breasted nuthatch (<i>Sitta carolinensis</i>)
	Paridae	Mountain chickadee (<i>Poecile gambeli</i>)
		Black-capped chickadee (<i>Poecile atricapillus</i>)
	Phasianidae	Wild turkey (<i>Meleagris gallopavo</i>)
	Accipitridae	Red-tail hawk (<i>Buteo jamaicensis</i>)
		Cooper's hawk (<i>Accipiter cooperii</i>)
Mammals	Cervidae	Mule deer (<i>Odocoileus hemionus</i>)
		Elk (<i>Cervus canadensis nelsoni</i>)
	Canidae	Coyote (<i>Canis latrans</i>)
	Sciuridae	Rock squirrel (<i>Otospermophilus variegatus</i>)
		Least chipmunk (<i>Neotamias minimus</i>)
	Ursidae	Black bear (<i>Ursus americanus</i>)

Table 2. Fauna Observed During Biological Survey
Page 2 of 2

Class	Family	Species
Mammals (cont.)	Leporidae	Mountain cottontail (<i>Sylvilagus nuttallii grangeri</i>)
	Geomyidae	Northern pocket gopher (<i>Thomomys talpoides</i>)
	Bovidae	Domestic cow (<i>Bos taurus</i>)

Table 3. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area, Page 1 of 2

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Birds	Southwestern willow flycatcher (<i>Empidonax trailii extimus</i>)	FE	Habitat consists of dense riparian vegetation growing on saturated soils along rivers, streams, or other wetlands, where its diet consists primarily of insects. Vegetation includes dense growth of willows (<i>Salix</i> spp.), arrow weed (<i>Pluchea sericea</i>), alder (<i>Alnus</i> spp.), and saltcedar (<i>Tamarix ramosissima</i>).	Unlikely to occur in the Project Area/Action Area, which do not contain any dense riparian vegetation, saturated soils, or surface water.
	Mexican spotted owl (<i>Strix occidentalis</i>)	FT	Primarily within shaded, mesic, and cool canyons with steep sides that have mixed conifer, pine-oak, and riparian forest types. Forests used for roosting or nesting often contain moderate to high canopy closure, a wide range of tree sizes suggestive of uneven-age stands, large overstory trees of various species, and high plant species richness with adequate levels of residual plant cover to maintain fruits, seeds, and regeneration to provide for the needs of prey species for the owl. In New Mexico, occurs in mountain ranges in the western two-thirds of the state; not recorded east of the Sangre de Cristo in the northern part of the state,	Unlikely to occur in the Project Area/Action Area. Yankee Canyon is outside the distribution of the Mexican spotted owl
	Piping Plover (<i>Charadrius melodus</i>)	FT	Piping plovers breed along ocean shores in the Northeast and along lakeshores and alkali wetlands in the northern Great Plains and Great Lakes. They, at all times, occur on sandflats or along bare shorelines of rivers, lakes, or coasts.	Unlikely to occur in the Project Area/Action Area, which do not contain any sandflats, bare shorelines of rivers, lakes, or coasts.

Table 3. Federally Listed Species Included in the Analysis and Likelihood of Occurrence in the Project Area/Action Area, Page 2 of 2

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area and/or Action Area
Mammals	New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)	FE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur in the Project Area/Action Area, which do not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.
Reptiles	None			
Amphibians	None			
Fish	Rio Grande cutthroat trout <i>Oncorhynchus clarkii virginalis</i>	FC	The Rio Grande cutthroat trout is a subspecies of cutthroat trout, endemic to the Rio Grande, Pecos, and possibly the Canadian River Basins in New Mexico and Colorado.	Unlikely to occur in the Project Area/Action Area, which do not contain any surface water.
Invertebrates	Monarch butterfly (<i>Danaus plexippus</i>)	FC	During breeding and migration, adult monarchs require a diversity of blooming nectar resources, which they feed on throughout their migration routes and breeding grounds (spring through fall). Monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. The correct phenology, or timing, in the life cycle of monarchs and blooming of nectar plants and milkweed is important for monarch survival. There are two migrating populations, eastern and western. New Mexico contains spring breeding areas primarily in the eastern third of the state (USFWS, 2020).	There is a low potential for the monarch butterfly to occur within the Project Area and/or Action Area. Yankee Canyon is located within the eastern third of the state where spring breeding areas have been documented. However, the potential for milkweed plant species to be present is low. No milkweed was observed during the site survey.

FE = Federal endangered

FT = Federal threatened

FC = Federal candidate

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 1 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Plants ^a	One-flowered milkvetch (<i>Astragalus wittmannii</i>)	—	The one-flowered milkvetch is endemic of northeastern New Mexico, where it is found in Greenhorn limestone hills and knolls in shortgrass prairie at 5,900 to 6,600 feet.	Unlikely to occur in the Project Area. The Project Area is not within Greenhorn limestone hills and knolls.
	Pecos mariposa lily (<i>Calochortus gunnisonii</i> var. <i>perpulcher</i>)	—	The Pecos mariposa lily is found in meadows and aspen glades in upper montane coniferous forest at 9,500 to 11,200 feet.	Unlikely to occur in the Project Area. The Project Area is outside of the elevational range for the species.
	Yellow lady's slipper (<i>Cypripedium parviflorum</i> var. <i>pubescens</i>)	—	Mesic deciduous and coniferous forest, openings, thickets, prairies, meadows, fens. In New Mexico sporadic in moist conifer forests, at elevations between 5,750 and 11,000 ft.	Unlikely to occur in the Project Area. As a result of the Track Fire in 2011, most of the Project Area has transitioned to drier, warmer habitat with much less conifer forest.
	Robust larkspur (<i>Delphinium robustum</i>)	—	The robust larkspur is found in canyon bottoms and aspen groves in lower and upper montane coniferous forest at 7,200 to 11,200 feet.	Unlikely to occur in the Project Area. The Project Area contains canyon bottoms; however, the canyon bottoms are dry, and there are no aspen groves. The Project Area contains much less coniferous forest due to the 2011 Track Fire.
	Sapello Canyon larkspur (<i>Delphinium sapellonis</i>)	—	The Sapello Canyon larkspur is found in canyon bottoms and aspen groves in lower and upper montane coniferous forest at 2,450 to 3,500 m (8,000 to 11,500 feet)	Unlikely to occur in the Project Area. The Project Area contains canyon bottoms; however, there are no aspen groves and the Project Area is outside of the species' elevational range.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 2 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Plants ^a (cont.)	Cimarron wild buckwheat (<i>Eriogonum aliquidum</i>)	—	The Cimarron wild buckwheat is presently known only from the Cimarron, Vermejo, and Canadian River basins where the shortgrass prairie meets the foot of the Sangre de Cristo Mountains. Dry, eroded, shaley slopes with stands of low shrubs in otherwise shortgrass steppe or low, clayey flats in alkali sacaton (<i>Sporobolus airoides</i>) grassland at 6,000 to 6,700 feet.	Unlikely to occur in the Project Area. The Project Area is not within dry, eroded, shaley slopes and is outside of the elevational range for the species.
	Spiny aster (<i>Eurybia horrida</i>)	—	Sandy shales on mountain and canyon slopes, from upper montane conifer forest down to juniper savanna; often associated with oak scrub; (4,100 to 10,700 feet). This species has great ecological amplitude occurring on dry, south-facing slopes in high mountains and shaded, north-facing slopes at low elevations.	There is a potential for the spiny aster to be present in the Project Area. However, the species was not observed during the biological survey.
	New Mexico stickseed (<i>Hackelia hirsuta</i>)	—	The New Mexico stickseed is found on dry sites of shaley or igneous soils in lower to upper montane coniferous forest, usually with Gambel oak at 7,700 to 10,200 feet.	There is a potential for the New Mexico stickseed to be present in the Project Area. However, the species was not observed during the biological survey.
	Wood lily (<i>Lilium philadelphicum</i> var. <i>andinum</i>)	—	Moist woodlands and meadows in mixed conifer forests and canyon bottoms, between 7,550 and 10,000 feet.	Unlikely to occur in the Project Area. Most of the Project Area has transitioned to drier, warmer habitat with much less conifer forest habitat due to the large scale forest fire in 2011. Canyon bottoms contain almost no surface water/ moist habitat.
	San Juan Mountains Starwort (<i>Stellaria sanjuanensis</i>)	—	The San Juan Mountains Starwort is narrowly restricted to dry, exposed alpine scree slopes of usually volcanic origin.	Unlikely to occur in the Project Area. The Project Area does not overlap with any alpine scree slopes.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 3 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Mammals	Least shrew (<i>Cryptotis parvus</i>)	ST	The least shrew is restricted to damp, mesic areas, such as the borders of streams or lakes, within otherwise relatively arid habitat.	Unlikely to occur in the Project Area. The Project Area does not contain streams or lakes.
	Pacific marten (<i>Martes caurina</i>)	ST	The Pacific marten prefers late successional stands of mesic, conifer-dominated forest. Optimum habitat appears to be mature old-growth spruce-fir communities with more than 30 percent canopy cover, well-established understory of fallen logs and stumps, and lush shrub and forb vegetation supporting microtine and sciurid prey. Their elevational range is from 7,000 to 13,000 feet, primarily above 9,000 feet. The species' distribution consists of disjunct areas in Rio Arriba, Taos, and Santa Fe, as well as extreme western Colfax, Mora, and San Miguel counties (Cartron and Frey, in press)	Unlikely to occur in the Project Area. The Project Area is outside the species' distribution
	New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)	SE/FE	Habitat specialist using persistent emergent herbaceous wetlands and scrub-shrub wetlands on wet soil along perennial streams. Also uses patches of herbaceous vegetation dominated by sedges along water edges within willow and alder dominated habitats.	Unlikely to occur in the Project Area. The Project Area does not contain emergent herbaceous wetlands, scrub-shrub wetlands, or willow and alder habitat containing sedges.
Birds	Piping Plover (<i>Charadrius melodus</i>)	ST/FT	Piping Plovers breed along ocean shores in the Northeast and along lakeshores and alkali wetlands in the northern Great Plains and Great Lakes. They, at all times, occur on sandflats or along bare shorelines of rivers, lakes, or coasts.	Unlikely to occur in the Project Area. The Project Area does not contain any sandflats, bare shorelines of rivers, lakes or coasts.

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 4 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Birds (cont.)	White-tailed ptarmigan (<i>Lagopus leucura</i>)	SE	This species presently is resident in the Sangre de Cristo Mountains, where populations occur on Costilla, Latir, Wheeler, Truchas, and associated peaks.	Unlikely to occur in the Project Area. The Project Area is not within the elevational range of the species in New Mexico.
	Least tern (<i>Sternula antillarum</i>)	SE	This species uses sandbars, beaches, and spits in coastal areas. In New Mexico and other parts of the southern Great Plains, alkali flats are selected as nesting areas.	Unlikely to occur in the Project Area. The Project Area does not contain beaches, sandbars, or alkali flats.
	Neotropic cormorant (<i>Phalacrocorax brasilianus</i>)	ST	The cormorant is found within lakes and river systems.	Unlikely to occur in the Project Area. The Project Area does not overlap with any major river systems or lakes.
	Brown pelican (<i>Pelecanus occidentalis</i>)	SE	The brown pelican occurs near river systems, lakes, stream and canals.	Unlikely to occur in the Project Area. The Project Area does not overlap with any major river systems, canals or lakes.
	Bald eagle (<i>Haliaeetus leucocephalus</i>)	ST	The bald eagle is usually found along seacoasts, lakes, and rivers. Nesting sites are usually isolated high in trees, on cliffs, or on pinnacles.	Unlikely to occur in the Project Area. The Project Area is not located near any seacoasts, lakes, or rivers.
	Common black hawk (<i>Buteogallus anthracinus anthracinus</i>)	ST	The black hawk is found within forested habitat along permanent streams	Unlikely to occur in the Project Area. The Project Area contains no riparian forest.
	Boreal owl (<i>Aegolius funereus</i>)	ST	The boreal owl inhabits old growth forests of spruce-fir primarily within the Rocky Mountain range.	Unlikely to occur in the Project Area. The Project Area is not within old-growth spruce-fir mountain forests

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 5 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Birds (cont.)	Peregrine falcon (<i>Falco peregrinus</i>)	ST	Habitat of the peregrine falcon is primarily located in open wetlands near cliffs. In New Mexico, the breeding territories center on cliffs that are in wooded/forested habitats with large "gulfs" of air nearby in which these predators can forage.	Unlikely to occur in the Project Area. The Project Area is not within an area that contains cliffs near wetlands.
	Southwestern willow flycatcher (<i>Empidonax trailii extimus</i>)	FE, SE	Habitat for the southwestern willow flycatcher consists of dense riparian vegetation growing on saturated soils along rivers, streams, or other wetlands, where its diet consists primarily of insects. Vegetation includes dense growth of willows (<i>Salix</i> spp.), arrow weed (<i>Pluchea sericea</i>), alder (<i>Alnus</i> spp.), and saltcedar (<i>Tamarix ramosissima</i>).	Unlikely to occur in the Project Area. The Project Area does not contain any dense riparian vegetation, saturated soils, or surface water.
	Baird's sparrow (<i>Ammodramus bairdii</i>)	ST	The Baird's sparrow breeds in a fairly small geographic area of south-central Canada, Montana, and North and South Dakota. It winters on grasslands of the northern Mexican plateau, primarily in Chihuahua and Durango but including portions of bordering states. The winter range extends into small portions of southeast Arizona, southern New Mexico, and southwest Texas. In New Mexico, Baird's Sparrow 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 state (NM Avian Conservation Partners, 2014; BISON-M, USGS distribution map).	Unlikely to occur in the Project Area. The Project Area is north of the known winter range of the Baird's sparrow and far outside the breeding distribution.
Reptiles	None			
Amphibians	None			

Table 4. Non-Federal Special-Status Species Identified for Project Area and/or Action Area, Page 6 of 6

Species Category	Species	Status	Habitat Associations	Potential for Presence in Project Area
Fish	Southern redbelly dace (<i>Phoxinus erythrogaster</i>)	SE	The dace is found in the upper Mora River drainage, in Coyote Creek, and in the tributaries of Black Lake in Colfax and Mora counties	Unlikely to occur in the Project Area. The Project Area does not overlap with any of the tributaries occupied by the species, nor does it contain enough surface water to sustain fish populations.
	Suckermouth minnow (<i>Phenacobius mirabilis</i>)	ST	The suckermouth minnow is found in the Dry Cimarron River, the Canadian drainage (Cimarron to Conchas Lake), and in the upper Pecos River from Sumner Lake to Fort Sumner.	Unlikely to occur in the Project Area. The Project Area does not contain any streams or river systems.
Mollusks	Lake fingernailclam (<i>Musculium lacustre</i>)	ST	The southernmost occurrence of the lake fingernailclam is in the Sangre de Cristo Mountains, within Colfax County. It is known within a localized distribution in upper Clenegville Creek (T25N, R16E), southeast of Angel Fire.	Unlikely to occur in the Project Area. The Project Area is not within the known distribution of the fingernail clam.
	Star gyro snail (<i>Gyraulus crista</i>)	ST	The star gyro snail has been found only in Coyote Creek, which is a tributary of Black Lake in Colfax County.	Unlikely to occur in the Project Area. The Project Area is not near Coyote Creek or Black Lake.
Invertebrates	None			

^a Includes species on the New Mexico Rare Plants list for Colfax County and NMNHP.

SE = State endangered

ST = State threatened

FE = Federal endangered

FT = Federal threatened

Appendix A

Photographs



1. From County Road A25 looking north toward Project Area



2. View from County Road A25 northern parcel upslope to the west of burned habitat that has regenerated in gambel oak scrub, mixed with ponderosa pine that survived the 2011 fire.



3. View to northeast of non-burned forest habitat from CR A25, northern parcel



4. Wild turkey bone observed in northern parcel



5. View from northwest corner of the northern parcel looking east/northeast



6. Gambel oak shrub above coal waste piles, northern parcel



7. Coal waste piles, northern parcel, looking southeast



8. Old mining road, northern parcel



9. Main canyon bottom, eastern boundary, northern parcel



10. Mining structure with overgrown vegetation, south end of the northern parcel



11. View to southeast from old mining road located on the north side of the southern parcel



12. View upslope from old mining road located at north side of the southern parcel



13. View to west from old mining road, southern parcel



14. View to south from old mining road, toward the southern project area in the southern parcel, showing the extensive burned area from the 2011 forest fire with a dense vegetation cover of gambel oak and locust shrubs



15. Coal waste pile, southern parcel, looking south



16. Surface water from a dripping pipe, located on the north slope of the upper main canyon in the southern parcel



17. Dense vegetation in bottom of canyon below the dripping spring



18. Coal waste pile on the south slope above the canyon bottom where dripping spring is located



19. View to north from the southern parcel, southern end of the Project Area



20. Coal waste piles, far southern end of the Project Area



21. Old mining road, far southern end of Project Area (southern parcel)



22. View to west toward coal waste pile at the upper reach of the main canyon in the Project Area, southern parcel



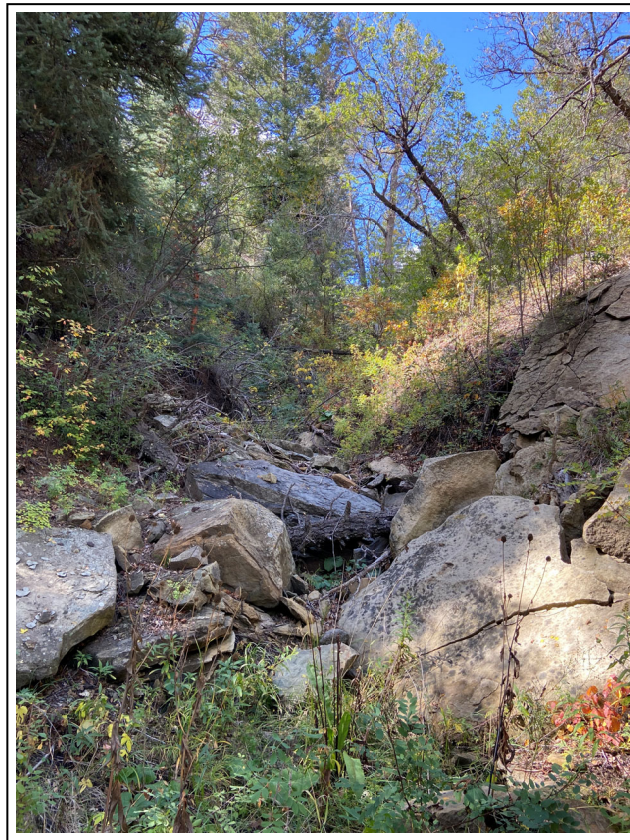
23. View to south from the coal waste piles at the upper reach of the main canyon



24. View of the upper main canyon, southern parcel



25. View upstream in the main canyon, showing narrow-leaf cottonwoods and dry stream bed



26. Bottom of main canyon, midway, southern parcel



27. View of habitat showing typical stand-replacing effects from the 2011 Track Fire



28. Rock squirrel



29. Least chipmunk



30. Prairie lizard



31. Baby horned lizard



32. Bear paw print



33. Wavy-leaf thistle, northern parcel

Appendix B

U.S. Fish and Wildlife
Information for
Planning and
Consultation Report



United States Department of the Interior

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



In Reply Refer To:
Project Code: 2022-0090377
Project Name: Yankee Canyon Reclamation

September 29, 2022

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

To Whom It May Concern:

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

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

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

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

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

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

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

Candidate Species and Other Sensitive Species

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

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

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

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

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

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

WETLANDS AND FLOODPLAINS

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

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

MIGRATORY BIRDS

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

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

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

regarding the implementation of Executive Order 13186.

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

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

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

Attachment(s):

- Official Species List
- Migratory Birds

Official Species List

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

This species list is provided by:

New Mexico Ecological Services Field Office

2105 Osuna Road Ne

Albuquerque, NM 87113-1001

(505) 346-2525

Project Summary

Project Code: 2022-0090377

Project Name: Yankee Canyon Reclamation

Project Type: Surface Reclamation - Coal

Project Description: Mine reclamation for historic coal mining

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@36.9503001,-104.34288256575209,14z>



Counties: Colfax County, New Mexico

Endangered Species Act Species

There is a total of 6 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.

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> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7965	Endangered

Birds

NAME	STATUS
Mexican Spotted Owl <i>Strix occidentalis lucida</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered

Fishes

NAME	STATUS
Rio Grande Cutthroat Trout <i>Oncorhynchus clarkii virginalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/920	Candidate

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

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

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
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black Rosy-finch <i>Leucosticte atrata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9460	Breeds Jun 15 to Aug 31

NAME	BREEDING SEASON
Brown-capped Rosy-finch <i>Leucosticte australis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 15 to Sep 15
Cassin's Finch <i>Carpodacus cassinii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Clark's Nutcracker <i>Nucifraga columbiana</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Jan 15 to Jul 15
Evening Grosbeak <i>Coccothraustes vespertinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Lewis's Woodpecker <i>Melanerpes lewis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Olive-sided Flycatcher <i>Contopus cooperi</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay <i>Gymnorhinus cyanocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15
Virginia's Warbler <i>Vermivora virginiae</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Western Grebe <i>aechmophorus occidentalis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31

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 (|)

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 <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.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](#) or [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 list of migratory birds that potentially occur 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 [Rapid Avian Information Locator \(RAIL\) 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 or migrating in my 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 query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. 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?

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 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.

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Lead Agency Contact Information

Lead Agency: Office of Surface Mining

Appendix C

State Threatened/
Endangered Species
Colfax County

Federal or State Threatened/Endangered Species

Colfax

<u>Taxonomic Group</u>	<u># Species</u>	<u>Taxonomic Group</u>	<u># Species</u>
Birds	12	Fish	2
Lepidoptera; moths and butterflies	1	Mammals	5
Molluscs	2		

TOTAL SPECIES: 22

<u>Common Name</u>	<u>Scientific Name</u>	<u>NMGE</u>	<u>USFWS</u>	<u>Critical Habitat</u>	<u>SGON</u>	<u>Photo</u>
Least Shrew	Cryptotis parvus	T			Y	View
Canada Lynx	Lynx canadensis		T			No Photo
Pacific Marten	Martes caurina	T			Y	View
Black-footed Ferret	Mustela nigripes		E		Y	View
Meadow Jumping Mouse	Zapus luteus luteus	E	E	Y	Y	View
White-tailed Ptarmigan	Lagopus leucura	E			Y	View
Piping Plover	Charadrius melodus	T	T			No Photo
Least Tern	Sternula antillarum	E			Y	View
Neotropic Cormorant	Phalacrocorax brasilianus	T			Y	View
Brown Pelican	Pelecanus occidentalis	E				View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Common Black Hawk	Buteogallus anthracinus	T			Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Boreal Owl	Aegolius funereus	T			Y	View
Peregrine Falcon	Falco peregrinus	T			Y	View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Baird's Sparrow	Centronyx bairdii	T			Y	View
Southern Redbelly Dace	Chrosomus erythrogaster	E			Y	View
Suckermouth Minnow	Phenacobius mirabilis	T			Y	View
Star Gyro	Gyraulus crista	T			Y	No Photo
Monarch Butterfly	Danaus plexippus		C			View
Lake Fingernailclam	Musculium lacustre	T			Y	View

Appendix D

BCI Report on
Yankee Canyon
Abandoned Mine
Bat Surveys

TO: Lloyd Moiola
Environmental Manager
New Mexico EMNRD
Santa Fe, New Mexico

Laurence D'Alessandro
Project Manager
New Mexico EMNRD
Albuquerque, New Mexico

FROM: Subterranean Team, Bat Conservation International
Dillon Metcalfe
Subterranean Specialist
Flagstaff, Arizona

Shawn Thomas
Subterranean Team Manager
Olympia, Washington

SUBJECT: Report on Yankee Canyon Abandoned Mine Bat Surveys

SURVEY

DATES: November 17-18, 2021

OVERVIEW:

This biological survey project assessed abandoned mines in Yankee Canyon, located on the flanks of Horse Mesa, east of Raton, New Mexico. All sites were surveyed by Bat Conservation International (BCI) staff following standardized protocols and safety procedures for providing subterranean mapping, biological data, and closure recommendations. Mapping efforts focused on accessible workings to determine proximity to road A-25 and a known subsidence in the middle of the roadway. The field project resulted in bat surveys being conducted on two distinct features, comprising two openings to the surface (Figure 1, Table 1). Bat habitat assessments and closure recommendations are provided for all features. A survey summary, full survey results, and a discussion of road A-25 can be referenced on the following pages.

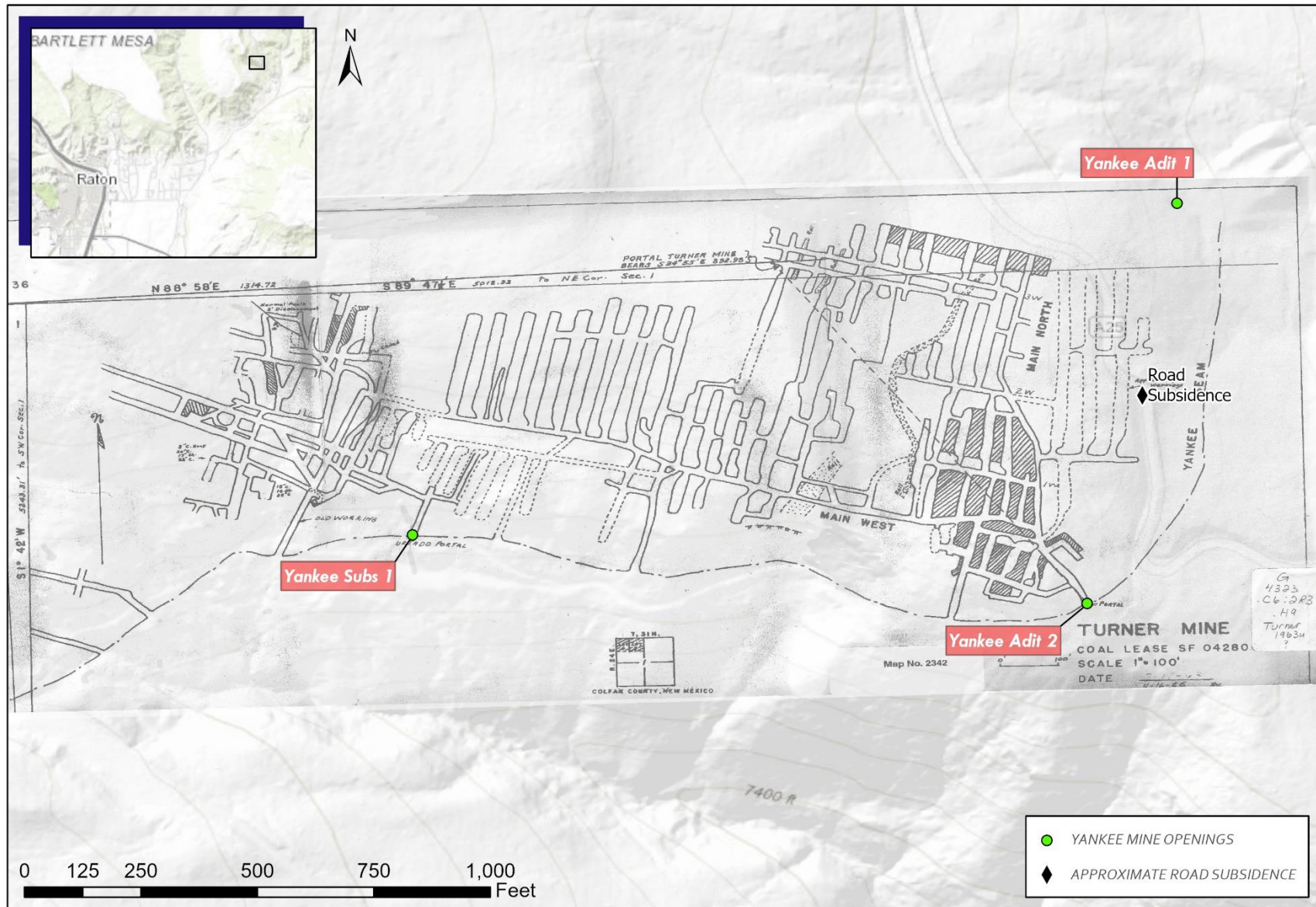
ACKNOWLEDGEMENTS:

BCI wishes to thank Lloyd Moiola for initiating the project and for providing the scope of work and site inventory descriptions. Special thanks to Laurence D'Alessandro for providing on-site navigation, assistance locating features, and serving in the surface safety role during field work. Additional thanks to Yeny Maestas, ENMRD, for joining the crew in the field.

All surveys conducted by BCI Subterranean Team staff: Dillon Metcalfe and Bill Burger. This report was authored by Dillon Metcalfe.

Report and photos submitted February 18, 2021.

BCI FIELD SURVEYS: YANKEE MINE GEOREFERENCE



Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community, Bureau of Land Management, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA, USDA

Figure 1: Overview Map of Project Area and Features Surveyed

Table 1. Summary of bat survey results and closure recommendations.

Feature¹	Closure Recommendation²	Live Bats³	Bat Sign	Roost Function	Bat Habitat
Yankee Adit VanLaten01	BCWS	3 COTO	none	hibernaculum	Good
Yankee Adit VanLaten02	DCWS	none	none	none	Moderate

¹Feature: A distinct feature may consist of a single opening, multiple openings interconnected via underground workings, or closely related surface workings. In the “Feature” column, distinct features are separated by solid lines, and associated openings of a feature are separated by dashed lines. A feature contains shared biological and habitat characteristics and is therefore described by a single survey, whereas closure recommendations are unique to each opening.

²Closure recommendations:

<u>Bat-compatible Closures</u>	<u>No Action</u>
BCAT – bat-compatible closure, any time	LAI – leave as is
BCCS – bat-compatible closure, cold season	
BCWS – bat-compatible closure, warm season	
CM – closure modification	
<u>Destructive Closures</u>	<u>Other Closure Type</u>
DCAT – destructive closure, any time	AC – airflow closure
DCWS – destructive closure, warm season	

³Bat species codes: COTO – Townsend's big-eared bat (*Corynorhinus townsendii*)

SECTION 1: SURVEY SUMMARY

BIOLOGICAL SURVEY SUMMARY:

Biological surveys are focused on subterranean habitat, with a primary emphasis on bat use. Surveys attempt to identify bat species present, document other bat sign (e.g., guano, insect parts, roost staining), and determine roost function of the site. Additionally, surveys document other wildlife use of features, evident by live animals, scat, nests, etc. All bat and other wildlife observations inform habitat assessments and closure recommendations.

Bat Use:

Two distinct features¹ received comprehensive biological surveys. Both of these features offered some level of subterranean habitat with potential for bat use. One feature contained three hibernating bats. No other bat sign was observed.

Other Wildlife Use:

Other wildlife sign consisted of a small amount of packrat scat in VanLaten 2.

BAT HABITAT ASSESSMENT SUMMARY:

Bat habitat assessments are determined based on observed bats and bat sign, along with physical characteristics of the site such as complexity and extensiveness of workings, portal size and obstructions, ceiling textures that bats select for, hydrological activity (such as seasonal flooding) that may preclude bat use, and any additional observations that may influence bat use of the site. A bat habitat assessment is applied to each distinct AML feature, which may include multiple openings. See Appendix 2 for additional details on assessment classifications. Bat habitat assessments for this project are summarized in Table 2.

Table 2. Bat habitat assessments for distinct AML features surveyed.

Bat Habitat Assessment	# Features
None	0
Poor	0
Marginal	0
Moderate	1
Good	1
Excellent	0
Unknown	0

¹ A distinct feature may consist of a single opening, multiple openings interconnected via underground workings, or closely related surface workings. Each distinct feature, including associated openings, contains shared biological and habitat characteristics and is therefore described by a single survey.

CLOSURE RECOMMENDATION SUMMARY:

Closure recommendations generally fall into bat-friendly or destructive closure categories and include a seasonal component that recommends the closure to occur either during the warm season, cold season, or at any time. A closure recommendation is provided for each individual opening of an AML feature. See Appendix 3 for additional details on recommendation classifications and Appendix 4 for guidance on conducting exclusion prior to closure. Closure recommendations for this project are summarized in Table 3.

Table 3. Closure recommendations for AML openings surveyed.

Closure Recommendation	Code	# Openings
Bat-compatible Closure, Any Time	BCAT	0
Bat-compatible Closure, Cold Season	BCCS	0
Bat-compatible Closure, Warm Season	BCWS	1
Other Wildlife-compatible Closure	OWC	0
Destructive Closure, Any Time	DCAT	0
Destructive Closure, Warm Season	DCWS	1
Leave As Is	LAI	0
Closure Modification	CM	0
Airflow Closure	AC	0

APPENDICES:

Appendix 1 contains selected photos from this survey project. Appendix 2 describes bat habitat assessment classifications. Appendix 3 describes closure recommendation classifications. Appendix 4 provides guidance on bat exclusion methods when recommended for destructive closures.

SECTION 2: FULL SURVEY RESULTS

Unless otherwise noted, all features are driven in moderate- to good-quality rock (qualitative safety assessment), contain good air*, and exhibit minimal signs of post-mining human disturbance. All feature locations are listed as latitude and longitude (decimal degrees) in the WGS84 datum.

* Good air is defined as no alarm sounding on the Altair 4x Multi-gas Detector carried during all surveys. The detector measures four gases (oxygen, carbon monoxide, hydrogen sulfide, methane) and alarms for gas levels that fall outside of safe thresholds.

Feature: Yankee Adit VanLaten01

Location: 36.95887065, -104.34187169

Date: November 17, 2021

Observations: This feature is a straight adit with a short crosscut that leads to another crosscut parallel to the main adit. Total workings are 457' and together form a capital "H" shape in plan view. The main adit is straight and wide and is 274' long to where it ends in collapse. It is very likely that this feature connected to the known historical workings of the Yankee Mine prior to this collapse. There are plentiful timber stulls fixed with intermittent porcelain knobs for electrical wire. 73' from the portal, a crosscut is driven 32' to the right, where it intersects another crosscut that is driven 89' in one direction and 63' in another. Three hibernating Townsend's big-eared bats were observed in various parts of the mine. No other wildlife sign was observed.

Bat Habitat: Good

Closure Recommendation: Bat-compatible Closure, Warm Season (BCWS)

Feature: Yankee Adit VanLaten02

Location: 36.95651851, -104.34240019

Date: November 17, 2021

Observations: This feature is a backfilled adit that has subsided. It can be identified by a piece of railroad rail that is stuck in the backfill material. The open subsidence is 2' wide and 1.5' high. 112' of workings were surveyed. The adit is driven straight for 55', where an unstable, collapsing area prevented further passage. A very large block of sandstone is precariously balanced on a single old stull, and passage would not be possible without pressing against the block in order to slide past. 29' from the face, a drift is driven to the left for 33' before ending in collapse.

Bat Habitat: Moderate

Closure Recommendation: Destructive Closure, Warm Season with exclusion.

Discussion of county road A-25: Attempts were made to find a connection between the subsidence and either of the accessible portals. Neither Yankee Adit 01 or Yankee Adit 02 connected to the subsidence via accessible subterranean workings. Both features ended in collapse before the large, historically documented workings could be reached. It is likely that the road overlays some historical excavation and that further subsidence is possible. Given the known extent of the historical mine, the road will likely need to be rerouted to the east and north. No major topographical obstacles appear to prevent this reroute, but extensive archeological resources in the vicinity of the portal should be considered before construction. The georeferenced map provided in Figure 1 of this report suggests that rerouting the road anywhere to the west would risk overlaying the historical workings that honeycomb the mesa.

APPENDIX 1

Selected photos from the field project. The full set of photos from all features was provided in digital form with this report.



Yankee Adit 01: Dillon examines the back for bats.
BCI Photo by Bill Burger



Yankee Adit 01: A Townsend's big-eared bat roosts on the ribs.
BCI Photo by Bill Burger



Yankee Adit 01: The coal seam is visible along the ribs.
BCI Photo by Bill Burger



Yankee Adit 02: The dangerous section that prohibited passage. Note the large, rectangular white block balanced on a single old timber stull.

BCI Photo by Bill Burger



Yankee Adit 02: Another view of the dangerous blockage.

BCI Photo by Bill Burger



Yankee Adit 01: Much of the feature required crawling squeezes to negotiate.
BCI Photo by Bill Burger



Yankee Adit 01: Dillon quietly crawls under a hibernating bat.
BCI Photo by Bill Burger

APPENDIX 2

Bat Habitat Assessment Classifications

Bat habitat is assessed for each feature surveyed and describes the value of that feature for bat use. Determining bat habitat is the primary objective of surveys conducted by the BCI Subterranean Program. Survey of a feature results in seven possible bat habitat classifications: excellent, good, moderate, marginal, poor, no habitat, or unknown. Each of these classifications are described below.

Excellent Bat Habitat

Description

Excellent bat habitat is very rare amongst features surveyed. For a feature to be assessed as having excellent habitat, significant bat use, usually by colonies, must be documented. Typically, this occurs when a large single species roost (>20 bats) is identified using the feature for warm season aggregation, usually in conjunction with substantial guano piles. Bats present in lower numbers but representing multi-species use of three or more species also warrants an assessment of excellent habitat. Bats need not be present to identify excellent habitat, as obvious bat sign such as large guano piles, heavily scattered guano along flyways, and roost staining on ceilings are indicators of significant bat use. Major winter use by bats cannot be confirmed during warm season surveys, though features that exhibit cold temperatures, airflow, and a high diversity of microclimates and roosting habitat can be identified as sites with good potential for serving as hibernacula. Features offering excellent bat habitat usually exhibit striking internal complexity, with extensive workings and possibly multiple levels. Due to the extensiveness of underground workings, these features nearly always offer high quality rock habitat. Exceptions, however, include small features used as maternity sites. Feature stability should be good, with little concern for future collapse that could result in loss of the roost.

Closure Recommendation

Features with excellent bat habitat should nearly always be recommended for protection (exceptions include imminent collapse or other major safety hazards). To minimize disturbance while bats are using the feature for a critical life cycle phase, bat-friendly closures should occur during the opposite season of primary use. For example, closure of a feature that hosts a maternity colony should occur during the cold season, and closure of a feature that serves as a hibernaculum should occur during the warm season. For features with multiple entrances, closures should protect all openings that are either used for bat access or necessary to preserve airflow patterns.

Good Bat Habitat

Description

Good bat habitat is represented by features that contain clear signs of persistent bat use but do not exhibit the striking evidence of significant use by bat colonies. These features often support use by one or two species of bats that use the site as a day roost or night roost. Bat sign such as guano, either scattered or in small piles, and insect parts are common in these features. The internal workings usually exhibit moderate complexity, with rock habitat quality that meets the specific needs of day or night roosting bats, such as domes, drill holes, and/or a heavily featured back. Feature stability should be good, with little concern for future collapse that could result in loss of the roost.

Closure Recommendation

Features with good bat habitat should nearly always be recommended for protection (exceptions include imminent collapse or other major safety hazards). Bat-friendly closures can usually occur at any time of the year, as bat use of these sites is persistent but dispersed and does not represent significant use for warm season maternity colony aggregation or cold season hibernation. For features with multiple entrances, closures should protect all openings that are either used for bat access or necessary to preserve airflow patterns.

Moderate Bat Habitat

Description

Moderate bat habitat generally refers to features that exhibit some signs of minor bat use or have potential for bat use due to the level of complexity and/or stable microclimate offered within. Moderate habitat features are often occupied by one or two bats, possibly on a seasonal nature, but will not display any signs of significant bat use. Guano, if present, will be lightly scattered, or in no more than a few very small piles representative of solitary bats of a single species. Insect parts may also be present, indicating night roosting. Bat sign may also be completely absent from these features at the time of survey, either due to extremely limited bat use, suspected winter use that cannot be detected during a warm season survey, or feature conditions such as flooding that may cover or destroy evidence of bat use. Complexity of the feature will range from simple, if combined with other signs of bat use, to moderately complex. Feature stability should be relatively stable, and rock habitat quality should offer some level of suitable roosting surface.

Closure Recommendation

Features with moderate bat habitat fall into the "grey area" where bat use is not necessarily prominent enough to immediately warrant a protective closure, yet the possibility for increased future bat use exists. Generally, a bat-friendly closure should be recommended for features with moderate habitat in order to maintain a conservative approach to habitat protection. Furthermore, the context of the feature relative to the surrounding landscape may elevate its importance if few other suitable habitat options are available. Scenarios that may call for destructive closure recommendations on features that meet the criteria for moderate habitat include unstable internal conditions that suggest future collapse/destruction of the feature or areas in which the feature is eclipsed by numerous other features with superior habitat. If a destructive closure is recommended, it must be accompanied by bat exclusion prior to closure.

Marginal Bat Habitat

Description

Features designated marginal bat habitat generally lack bats and bat sign. Less commonly, these features may exhibit signs of very minor, infrequent use. A single bat may be present, but there may be no accompanying signs that would allow detection if the bat was absent. Guano and insect parts, if present, will be very sparsely scattered and require diligence for detection. Complexity of the feature will always be simple, with no substantial workings; however, these features are usually extensive enough to include a dark zone, and the entire feature is not visible from the portal or collar. Marginal features are often short, simple adits or blind and bald shafts. Feature stability can be stable, but often poor rock conditions contribute to marginal habitat. Rock habitat quality will generally be poor to fair, with less than ideal roosting surfaces.

Closure Recommendation

Features with marginal bat habitat are almost invariably recommended for destructive closure due to these features lacking bat sign and/or containing unstable conditions that threaten collapse. Given the possibility for bats to be present in these features, exclusion is required prior to closures occurring in the warm season when bats are active. In rare circumstances, a protective closure may be warranted to allow for the possibility of future bat use, especially if the feature represents one of the only subterranean habitat options in the area.

Poor Bat Habitat

Description

Features classified as poor bat habitat tend to be very small prospects that exhibit no signs of bat use. While these features offer some level of subterranean habitat, the workings are so limited as to offer no true dark zone and no area of stable subterranean microclimate. Usually, the entire feature will be visible from the portal or collar. These features are so small that structural stability is often quite good, but they may also be in a state of collapse. Rock habitat quality can range the entire spectrum, but this assessment is largely irrelevant in such small features that offer little physical area from which bats can select roosting spots that have a stable microclimate.

Closure Recommendation

Features with poor bat habitat are recommended for destructive closure. Due to the lack of bat sign or potential for future bat use, a "DCAT" recommendation is usually warranted on these features.

No Bat Habitat

Description

Assessing a feature as containing no bat habitat means no subterranean habitat is available. No underground workings are present at all, and the feature would present no option for bats to roost in subterranean environments. This scenario occurs for features that are totally collapsed, prospect scrapes, entirely and permanently flooded, or some other similar circumstance. This assessment is also appropriate for portals that are almost entirely sloughed closed and/or overgrown with vegetation such that bats would be unable to access the workings.

Closure Recommendation

With no subterranean component and thus no bat habitat, a "DCAT" recommendation is always warranted. For some features, though, especially those that contain no inherent hazard, a "Leave As Is" recommendation may be most appropriate. This recommendation is most applicable to prospect scrapes and pits that contain no headwall and may be largely overgrown.

Unknown Bat Habitat

Description

If an internal survey cannot be conducted, and underground workings are likely to exist based on observations from the surface, then bat habitat cannot be assessed. This usually occurs when the feature is not accessible due to safety concerns (e.g., wildlife hazards, rock or timber hazards) at the portal or collar. Often, looking into the feature from outside confirms that underground workings are present, though inaccessible. An unknown bat habitat assessment may also be appropriate for some partial internal surveys, when a survey is terminated underground due to safety concerns. In these instances, though, if extensive workings and/or bats and bat sign are observed prior to terminating the survey, then a higher bat habitat classification and feature protection are warranted.

Closure Recommendation

Closures of features with unknown bat habitat should follow conservative recommendations to minimize the possibility of destroying potentially important bat roosts. When possible, bat-friendly closures should be recommended for these features. In cases where destructive closures are more appropriate (e.g., collapse of feature is imminent), exclusion is required prior to closures occurring in the warm season when bats are active.

APPENDIX 3

Closure Recommendation Classifications

Closure recommendations are assigned to each opening of a distinct feature surveyed and prescribe the appropriate remediation strategy for the site. Bat use, other wildlife use, feature stability, and overall nature of the workings are considered when determining the closure recommendations. Survey of a feature usually results in recommendation of a bat-compatible closure or destructive closure for each opening, with a seasonal component to advise suitable timing of the closure. In some cases, openings may warrant other wildlife-friendly closures or recommendation of no action (leave as is). Each of these classifications are described below.

Bat-compatible Closures

Bat-compatible closures are recommended for openings to features that contain bats / bat sign and/or exhibit characteristics that indicate high potential for bat use. These features warrant protective closures to maintain the bat habitat within and allow for continued bat use. Bat-compatible closures include a variety of methods that fall on a spectrum of high to low compatibility. No closure method is perfect for all bat species, but generally, gates designed to comply with bat-compatible specifications are preferred to 1) minimize the potential of disrupting current use patterns and 2) promote long-term access for bats and other wildlife. For openings that are unstable or present access challenges, construction of a standard bat gate may not be possible. In these instances, use of alternative methods such as culverts or cable nets may be the most feasible method; while these closure types are not ideal for bats and other wildlife, they may still facilitate moderate levels of access and habitat use and therefore present a suitable alternative to total habitat loss.

Three seasonal designations are used to recommend appropriate timing of bat-friendly closures:

- **BCAT (Bat-compatible Closure, Any Time):** "Any time" bat closures are recommended for openings to features in which overall bat use is relatively minor or not confined to any single season.
- **BCCS (Bat-compatible Closure, Cold Season):** Cold season bat closures are recommended for openings to features that display significant warm season use, typically by a maternity colony of bats. Closure is recommended to occur during the cold season to avoid disturbance of bat colonies, which could potentially lead to abandonment of the site.
- **BCWS (Bat-compatible Closure, Warm Season):** Warm season bat closures are recommended for openings to features that are documented as hibernacula or exhibit characteristics that indicate high potential for significant cold season use by hibernating bats. Closure is recommended to occur during the warm season to avoid disturbance of hibernating bats, which could potentially lead to bats arousing and burning critical energy reserves.

Airflow Closures

Airflow closures may be recommended for secondary openings to features with multiple openings that access habitat warranting protection. Independent, secondary openings often contribute to the microclimate and habitat suitability of the underground workings via air exchange but may not serve as important access points for wildlife. In these cases, it is appropriate to close these secondary openings in a way to maintain air exchange without preserving access to wildlife.

Other Wildlife-compatible Closures

Protection may also be recommended for openings to features that display significant use by wildlife other than, or in addition to, bats. These closure recommendations are relatively rare, and closure methods are dependent on type of wildlife use. Protection of features may be warranted for use by wildlife including, but not limited to, birds (e.g., owls, vultures), mammals (e.g., cats, foxes, porcupines, ringtails), and reptiles/amphibians (e.g., salamanders).

Closure Modifications

Closure modifications are recommended for existing closures such as bat gates or backfills that do not adequately protect or maintain habitat provided by the feature. In these cases, a modification to the existing closure is recommended to improve wildlife access to habitat assessed at the time of survey. Closure modifications are recommended to provide access to previously inaccessible habitat or to facilitate increased use of existing habitat. Seasonality is also considered in closure modification recommendations to advise suitable timing of the modification.

Destructive Closures

Destructive closures are recommended for openings to features that either offer no bat habitat, contain no evidence of bat use, or exhibit only minor, insignificant bat use. In some cases, destructive closures may also be recommended for secondary openings to features that are protected through bat-compatible closure of primary openings used for wildlife access. Two destructive closure designations are used to recommend appropriate measures based on possible bat use:

- **DCAT (Destructive Closure, Any Time):** These openings access features that exhibit no signs of bat use or potential for bats to be present and can be destructively closed without conducting exclusion, during any season. This recommendation may also be applied to secondary openings to features protected for wildlife habitat, provided that these openings do not serve any critical function in maintaining wildlife access or suitable habitat conditions.
- **DCWS (Destructive Closure, Warm Season):** These openings access features that either exhibit signs of minor, insignificant bat use or have the potential for bats to be present

during destructive closure. In some cases, other wildlife such as birds may be present, and these animals should also be excluded; alternatively, closure with bat exclusion may be timed for after the nesting season when birds are no longer using the feature. Using appropriate exclusion techniques on the features prior to closure is critical. Exclusion needs to be done during the warm season when bats are active and will be able to escape. See Appendix 5 and refer to “Managing Abandoned Mines for Bats,” published by Bat Conservation International, for guidance on exclusion techniques.

No Action

"Leave as is" treatments are recommended for features that present no inherent safety concerns. A feature with this recommendation is generally either a prospect scrape/trench with no subterranean component, or the portal has completely collapsed, making the feature inaccessible.

APPENDIX 4

Exclusion Guidance as Excerpted from BCI's "Managing Abandoned Mines for Bats"

Timing of Exclusions

The exact timing of exclusions and site closures is best determined locally, given the variability in types of use by different species. As a general rule, bats must be active for exclusions to be effective, so all exclusions should be conducted outside of hibernation season. In general:

- The best time to implement exclusions and portal closures is during late summer or early fall, after cessation of maternity activities and before the onset of hibernation.
- Early-fall closures will best ensure a window for bats to find alternate hibernacula and will give females a full spring season to locate alternate maternity sites.

Exclusions for Destructive Closures

Regardless of the reason for a destructive closure of known or potential bat roosts, steps must be taken to ensure significant bat colonies are not destroyed as a direct result of closure activities. Managers should include adequate exclusions as a routine part of mine reclamation programs to minimize the risk of entombing bats in closed workings. Further, closures should be conducted immediately following exclusion to limit the chance of bats becoming reestablished in the mine. In general, these two guidelines can help determine whether exclusions should be conducted and how intense the exclusion effort should be.

Exclusions Not Required: Exclusions are generally not required if a mine does not offer potential bat habitat, as mutually agreed upon by all partners involved in the mine closure project.

Standard Exclusions: In general, exclusions are recommended at all mines that represent habitat for bats. Given the ephemeral and episodic use of some roosts, it is prudent to err on the side of caution and conduct standard exclusions efforts, especially if significant time has elapsed since biological assessments were conducted.

The use of one-inch mesh material (e.g., chicken wire, polypropylene or similar material) is most often used to exclude bats from a mine. Lighter-weight material may be used for remote mines that require physically transporting the material over long distances or rough terrain. Although this material is very effective for excluding bats, it may also entangle bats and other wildlife. Managers may need to develop a plan to periodically check exclusion materials at sites with large bat colonies or high use by other wildlife to prevent loss of entangled bats, amphibians, reptiles or birds.

Exclusion materials should be maintained for at least three nights prior to portal closure at mines that provide habitat and where little or no bat use has been detected. Simultaneously

covering all external openings with exclusion materials and leaving it in place for at least one week is an effective method for excluding most bat species from roosts. Difficulties in navigating through exclusion materials should cause bats to seek alternate roosts rather than continuing to access the mine through the wire.

For most species, simply spreading exclusion materials across portals will be sufficient to allow bats to exit a mine while effectively discouraging their return. However, not all bats in all roosts across all landscapes will respond in an identical manner. As a general rule, smaller colonies in areas where roosts are abundant tend to quickly abandon roosts after exclusion materials are installed. For example, exclusion materials left in place for three to five nights will usually cause small colonies of Townsend's big-eared bat roosting in small mines in Nevada to abandon the roosts.

END OF SURVEY REPORT