Elena Gallegos Habitat Survey
FINAL REPORT

April 2023

City of Albuquerque
Open Space Division
Parks & Recreation Department
P.O. Box 1293
Albuquerque, NM 87103

Prepared by:

Tetra Tech
6121 Indian School NE
Suite 205
Albuquerque, NM 87110

Table of Contents

List of Figures

List of Tables

1 - Executive Summary

Among the many natural and cultural riches of Albuquerque are the Sandia Mountains and foothills. The City of Albuquerque Open Space Division (OSD) manages over 2,100 acres of the Sandia Mountains foothills. With the increase in recreational use of the City's Major Public Open Spaces, the City of Albuquerque Open Space Division (OSD) conducted an assessment and feasibility study of the Elena Gallegos Open Space in 2021. The purpose of the study was to consider ways to enrich the visitor experience and enhance the educational opportunities for the public while protecting the natural and cultural resources of the area. Areas of focus for the study were: 1) condition of facilities, 2) road access and bicycle safety, 3) equitable access, and 4) public safety and security.

Among the findings and recommendations of the feasibility study was that a new facility could serve to enhance the education mission of the OSD, could provide for better visitor service and public safety, and could improve natural and cultural resource protection. The study evaluated seven sites for a possible location for a potential education center. The two highest rated sites were forwarded for further review.

The consulting and engineering firm, Tetra Tech, was selected to conduct a study of the potential impact on wildlife habitat for two possible sites for an education center. A number of parameters were evaluated including soils and topography; hydrology and geomorphology; aesthetics; vegetation communities; fish and wildlife; endangered, threatened, and special status species; land use; recreational resources; and public health and safety.

Based on the review and analysis, it is concluded that due to the small scale of the proposed education center, the facility will likely have little impact on the wildlife present within the Elena Gallegos Open Space and the Sandia Mountains foothills.

2 - Introduction

The Elena Gallegos Open Space is a 640-acre park located in the foothills of the Sandia Mountains east of Albuquerque, New Mexico and adjacent to the Cibola National Forest (Figure 1). The property was purchased in 1982 by the City of Albuquerque (COA) and has since been developed into an Open Space park containing 10 trails (eight of which are multi-use trails, and two are hiker-only trails), a spring-fed pond with a bird viewing area, an amphitheater, seven picnic areas, two reservation areas with barbecue grills, shaded rest stops with interpretive artwork, four parking lots, two restrooms, and a fee area. The Open Space also offers visitors recreational access to the Sandia Ranger District of the Cibola National Forest and views of the distant Jemez Mountains, the San Mateo Mountains, and Mount Taylor.

This Report has been prepared to evaluate the natural resources present within two potential project sites for an education center at the Elena Gallegos Open Space and provide best management practices as well as habitat improvement recommendations.

This report includes a description of the methods and results of the desktop and field assessment, presents existing conditions, and evaluates the vegetation and habitat characteristics within the prospective project sites including a discussion of plant species and diversity, noxious weeds, and other

nuisance plant species. High-value habitat was also evaluated to support the Open Space Division (OSD) decision-making process for proposed construction activities.

3 - Proposed Action

Public use of outdoor spaces has increased dramatically in recent years. In 2022, the number of recreational visitors to Elena Gallegos Open Space was 215,000. With the increased public use and interest, the City is evaluating ways to enrich the open space experience and enhance educational opportunities while also protecting the natural and cultural resources of the Sandia Mountains foothills.

The City is considering the construction of a facility in the Elena Gallegos Open Space that could improve the delivery of visitor services and enhance the ability to offer educational opportunities. To identify an optimal site for the education center, the City of Albuquerque OSD conducted a feasibility study of seven sites within the Elena Gallegos Open Space to identify potentially suitable locations for an education center to serve the foothills area of the Sandia Mountains. Seven potential sites were evaluated using seven criteria, which included:

- Vehicle access
- Impacts on immediate site and adjacent areas (including cultural resources and natural resources)
- Circulation and parking (including both existing parking and potential parking areas)
- Infrastructure connections
- Viewsheds
- Neighborhood impact
- Site suitability

The criteria were evaluated on a scale of 1 to 3, 1 being poor and 3 being good. Seven sites were evaluated: Site 1A (Cottonwood Springs), Site 1B (Cottonwood Springs), Site 2 (Attendant Booth), Site 3 (Inner Loop Rd.), Site 4 (Pino Trail), Site 5 (South Loop Rd.), Site 6 (Tramway Blvd.). The results of the evaluation can be seen in Table 1 below (Dekker Perich Sabatini, 2022), including maps of the other sites evaluated.

Table 1. Site Suitability Scoring Matrix.

Criteria Number	Criteria	Site						
		1A	1B	2	3	4	5	6
1	Vehicular Access	2	1	2	3	2	2	3
2	Impacts on Immediate Site and Adjacent	2	3	2	2	1	2	1
3	Circulation and Parking	2	2	1	2	2	2	3
4	Infrastructure Connections	3	3	3	2	3	1	3
5	Viewsheds	1	3	3	2	2	3	1
6	Neighborhood Impact	3	3	1	3	3	2	1
7	Site Suitability	3	3	1	3	3	2	1
Total		**15**	**17**	**14**	**17**	**16**	**14**	**13**

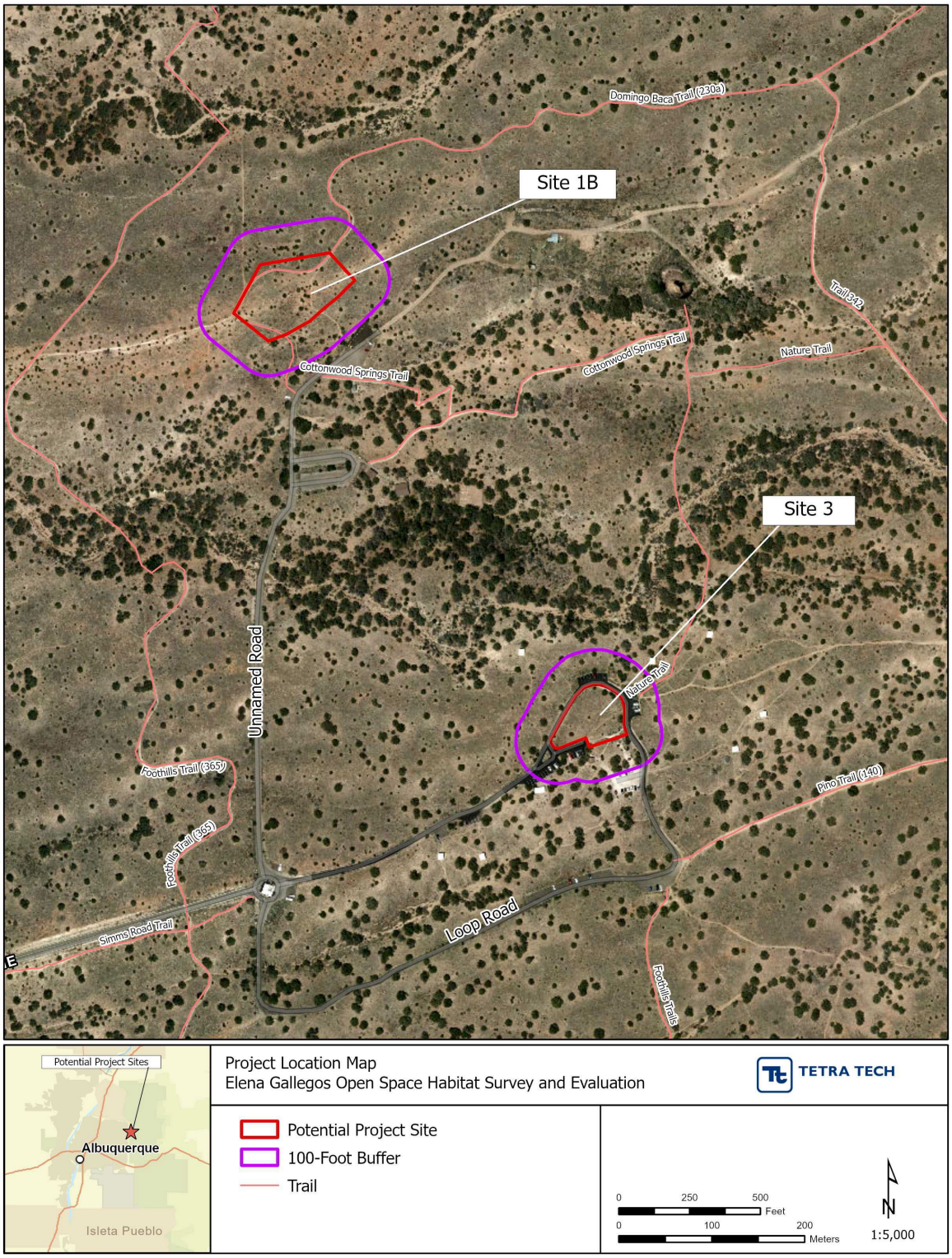
The evaluation identified two preferred site options: Site 1B and Site 3 (Figure 1). Site 1B was identified as having an excellent location that does not add to current park congestion and contains views of the Sandia Mountains and is within proximity of trailheads. Site 3 was identified as offering existing vehicular access, proximity to existing trailheads and low visibility from neighboring properties. The Feasibility Study also recommended a 4,800 square foot building design for either selected site option.

As mentioned above, this report will further evaluate the natural resources of the two site options describing the current existing conditions, and a resource evaluation of potential impact on the following resources:

- Soils and Topography
- Hydrography, Hydrology and Geomorphology
- Site Aesthetics
- Vegetation communities
- Wildlife
- Threatened, Endangered and Protected Species
- Land Use
- Recreational Resources
- Public Health and Safety

This report will also make recommendations to improve existing resources and habitat and mitigate any potential impacts that construction of the proposed project may have at either Site 1B or Site 3.

Figure 1. Prospective Project Sites Location Map.



4 - Methods

A combination of desktop and field methods were used to characterize the proposed project site areas.

4.1 Desktop Methods

Desktop research and analysis evaluated the regional and local habitat types and the associated biological resources known to occur or have potential to occur in the survey area. The following resources were consulted in this stage:

- Southwest Regional Gap Analysis Project (SWReGAP) (Lowry et al. 2005; USGS 2005)
- New Mexico Rare Plants List (NMRPTC 2020)
- New Mexico Biota Information System of New Mexico (BISON-M) Database (NMDGF 2022a)
- New Mexico Environmental Review Tool (NMDGF 2022b)
- Envirodata Review Tool (NHNM 2022)
- New Mexico Department of Agriculture (NMDA) Noxious weeds list (NMDA 2020)
- National Hydrography Database (NHD)
- National Wetlands Inventory (NWI)

4.2 Field Methods

Prior to the field visits, the perimeter of the prospective sites including a 100-foot buffer (survey area) was uploaded to ArcGIS Field Maps software. Additionally, an editable layer was published to ArcGIS Field Maps for field data collection and made available on a mobile device. These layers were available to support locational awareness during the field session and were used for all documentation activities.

Field methods consisted of the documentation, mapping, and recording of the presence, distribution, and habitat characteristics of all species of special concern. Field data collection was accomplished by walking meandering transects that ensured full visual coverage of the survey area to inventory biological resources within a 100-foot buffer. Vegetation and accompanying habitat features within the survey buffers and additional transects were recorded in addition to other abiotic and biotic features, such as erosion.

A general list of plant species found within the boundaries of the survey buffer, or within the vicinity of the overall area surveyed was compiled (Appendix A). The location and approximate extent of any noxious or problematic plant species was noted and digitized in the field. Similarly, changes in vegetation composition and the presence of any plant species of special concern were documented. Survey activities also noted any potential environmental issues to provide recommendations to reduce or eliminate environmental impacts.

5 - Existing Conditions

5.1 Soils and Topography

The Sandia Foothills Area is part of a topographic region that is comprised of the hills, alluvial fans, and drainages of the foothills of the Sandia Mountains. The Elena Gallegos Open Space is located within the Sandia Foothills Area.

5.1.1 Site 1B

A total of two soil types were identified within the Site 1B and the associated 100-foot buffer. These soils are largely homogeneous but are dominated by well-drained types with depths of over 80 inches. The most prevalent soil type within the site is Embudo-Tijeras complex, 0-9 % slopes, which is formed in alluvium from igneous and sedimentary rock. The Embudo-Tijeras complex covers 99.5% of Site 1B and the 100-foot buffer and typically occur on terraces and alluvial fan remnants. This soil typically occurs on 0-9% topographic slopes (NRCS 2023). For a Map of the topography of Site 1B, See **Error! Reference source not found.**.

The other soil type within Site 1B is Tesajo-Millet stony sandy loams, which is derived from alluvium generated from igneous and sedimentary rock. This soil type covers 0.5% of Site 1B and the 100-foot buffer and typically occurs on floodplains, terraces, alluvial fans, fan terraces and stream terraces. It usually occurs in areas with 3-30% topographic slopes (NRCS 2023). A comprehensive soil report for Sit 1B is attached in Appendix G.

Two areas with active erosion were also noted in Site 1B. Active erosion was generally indicated by a lack of vegetative cover and evidence of eroded soil material resulting from trail drainage features or channel formations parallel and adjacent to existing trails. Images of these typical erosion types are shown in Photographs 1 and 5 (Appendix B). Analysis of aerial imagery revealed that these erosional features may have once been part of a two-track road, which formerly ran from the nearby stable structures mentioned in the Feasibility Study (Dekker Perich Sabatini 2022) westward into the adjacent neighborhood.

5.1.2 Site 3

One soil type was identified within the Site 3 and the associated 100-foot buffer. The soils within the site are homogeneous, but well drained with a depth of more than 80 inches. The soil type within the site is Tesajo-Millet stony sandy loams, which is derived from alluvium from igneous and sedimentary rock. This soil type typically occurs on floodplains, terraces, alluvial fans, fan terraces and stream terraces. It is also associated 3-30% topographic slopes (NRCS 2023). A comprehensive soil report for Site 3 is attached in Appendix G.

5.2 Hydrography, Hydrology and Geomorphology

The Albuquerque Foothills Area falls within the transition zone between the Sandia Mountains and the Llano de Sandia of the Albuquerque sub-basin of the Rio Grande rift of the Mexican Highlands section of the Basin and Range geomorphic province (Connell 1996). The Llano de Sandia is part of the western piedmont and is comprised of alluvium from the Sandia Mountains, while the Sandia Mountains are an east-tilted formation of Phanerozoic sedimentary and Precambrian crystalline rock bounded by faults (Connel 1996).

An analysis of the NHD and NWI data reveals that the Elena Gallegos Open Space lies within the Arroyo de Domingo Baca (Hydrologic Unit Code (HUC) 12: 130202030302) and Arroyo del Pino (HUC 12: 130202030303) watersheds, which lie within the greater City of Albuquerque-Rio Grande watershed (HUC 10: 1302020303) that is part of the Rio Grande-Elephant Butte Watershed (HUC 4: 1302). One large drainage system, the Arroyo del Pino runs through the Open Space, along with several smaller ephemeral systems (USGS 2022). The Arroyo del Pino drains to a retention area west of

Tramway Blvd. before flowing downhill to the North Diversion Channel, which flows to the Rio Grande (COA 2022; Connell 1996). Other hydrologic features within the Elena Gallegos Open Space include the Cottonwood Springs Natural Preserve which contains a natural spring and lined pond (COA 2022a). This feature lies approximately 1000 feet east of Site 1B. For a Map of the HUC 12 units present within Elena Gallegos Open Space, see Appendix I.

5.2.1 Site 1B

The presence of two shallow vegetated swales was observed within Site 1B (Figure 2). The northern swale flows into the Sandia Heights South neighborhood west of the Open Space and dissipates. The southernly swale once ran across the southern section of Site 1B, however a portion of it has filled with fill material from mobilized gravel and silt from the adjacent parking lot and separates the eastern and western sections of the swale. It was observed that this swale flows into an unnamed tributary of Arroyo del Pino, which was observed southwest of Site 1B outside of the prospective project site (Figure 2).

One granite outcrop was found within Site 1B. Rock outcrops are protected by the COA Integrated Development Ordinance (IDO) (COA, 2022) and development which effects natural rock outcrops is prohibited.

5.2.2 Site 3

The presence of two culverts was observed within Site 3. The northern most culvert appeared to be inactive as the culvert channel was filled with soil and perennial grasses were observed growing in front of it. The southernmost culvert appears to receive water that is shed from the adjacent road. These culverts lead to a shallow erosional feature southwest of Site 3's buffer area that flows into an unnamed water (as identified in NHD mapping) approximately 350 feet southwest of Site 3. This water flows into the neighborhood west of the Elena Gallegos Open Space where it dissipates. Photographs of the culvert features are shown in Photographs 9 and 10 (Appendix B). Figure 3 shows the location of the two culvert features and the unnamed waters.

Figure 2. Features Present within Site 1B

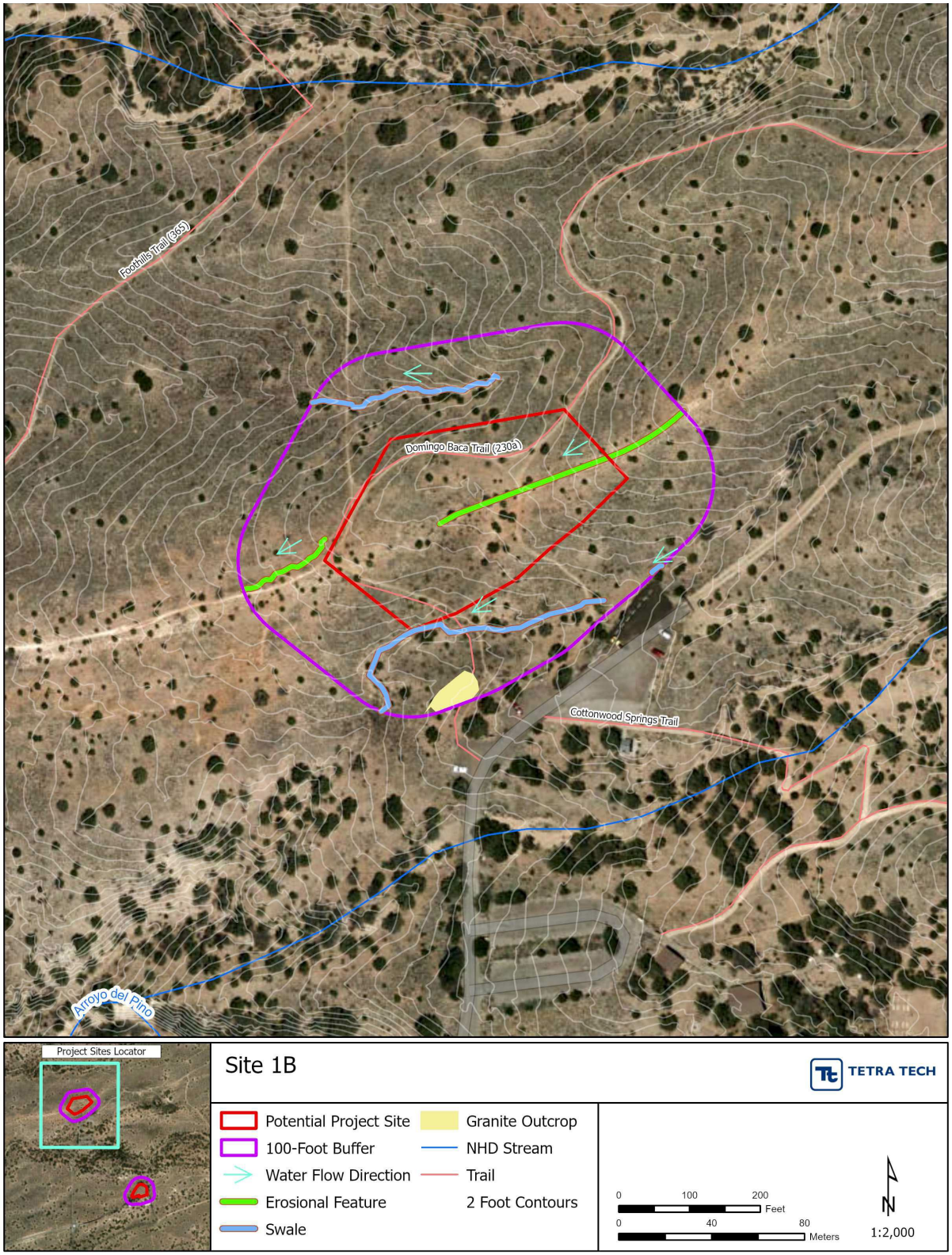
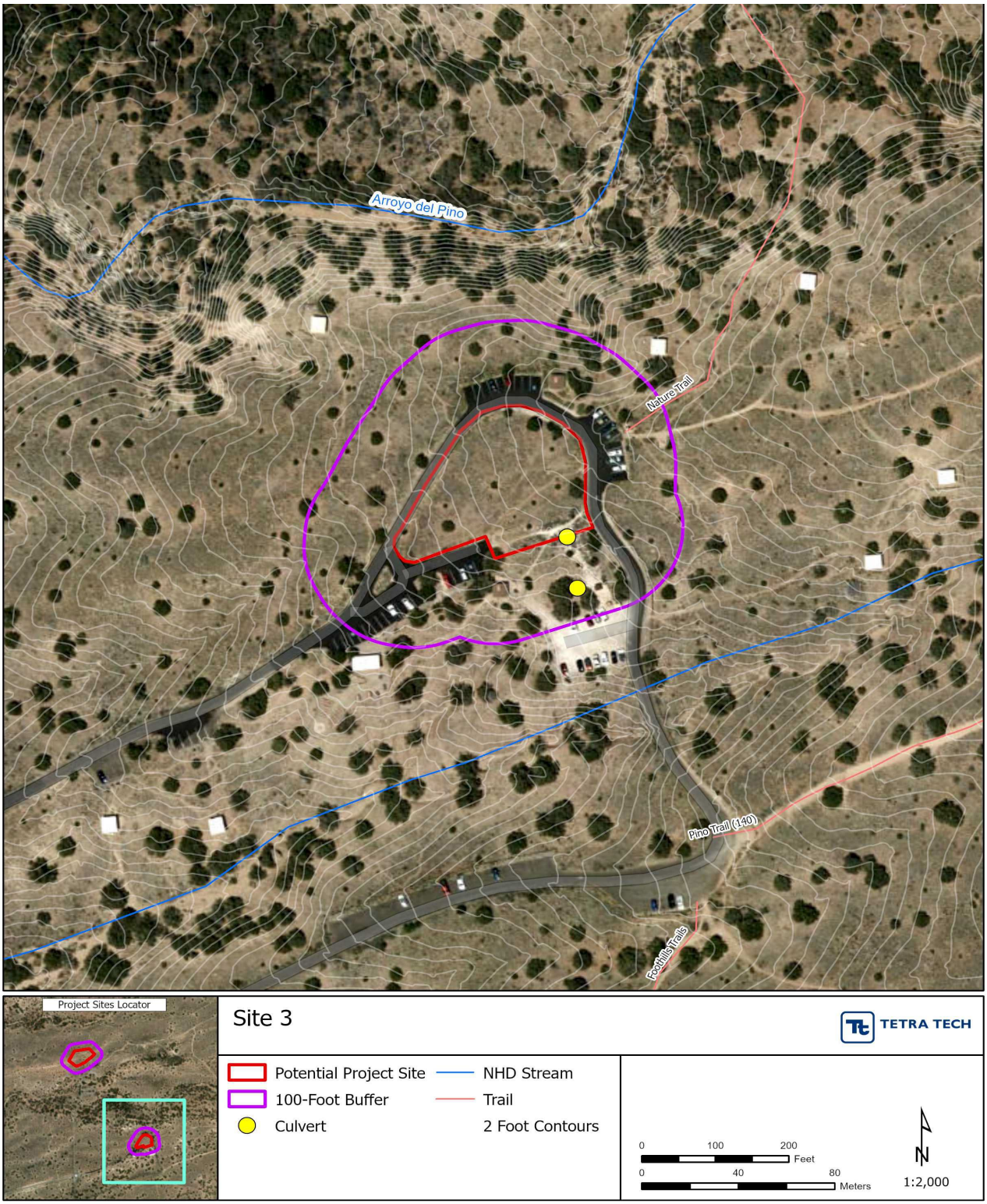


Figure 3. Features Present within Site 3.



5.3 Aesthetics

The Elena Gallegos Open Space lies within the Foothills Area of the City of Albuquerque, which was formerly regulated by the Sandia Foothills Area Plan (CABQ 1983). This plan was repealed and replaced in 2022 by the City of Albuquerque Integrated Development Ordinance (IDO; CABQ 2022). The IDO shows the area of the foothills that contains the Elena Gallegos Open Space zoned as R-PO-B, which means Major Public Open Space (MPOS) (CABQ 2023).

One of the purposes for maintaining public open space listed by the Parks and Open Space Plan Element (CABQ and Bernalillo County (BC) 2017) is, "views of significant natural landscapes can contribute to psychological and emotional health." Open spaces are also meant to provide visual relief from the urbanized landscape of Albuquerque. Policy C.6.E. of the city of Albuquerque Major Public Open Space (MPOS) Facility Plan (1999) incorporates this by specifying that visual relief includes view sheds, view corridors, mountain tops, high points, and escarpments.

The Elena Gallegos Open Space offers visual relief from the City of Albuquerque due to its pinyon-juniper woodland paired with views of the nearby Sandia Mountains to the east and Tijeras Arroyo to the south, and the distant Jemez Mountains to the northwest, the riparian woodlands of the Rio Grande, and Mount Taylor to the west (CABQ 2023b).

5.3.1 Site 1B

Site 1B is situated in a dispersed Pinyon-Juniper woodland. Three trails are visible within the site, and two parking lots and a vault toilet are also visible from the site. Site 1B offers largely unobstructed views of the Cities of Albuquerque and Rio Rancho as well as Mt. Taylor to the west, the Sandia Mountains, and surrounding foothills to the east. See the photo log in Appendix C for pictures of Site 1B. This site is visible from the residential development to the west.

5.3.2 Site 3

Site 3 is also situated within a dispersed pinyon-juniper woodland. It contains one vault toilet and is within view of another vault toilet. Three parking lots are also visible and immediately adjacent to the site in addition to a double picnic shelter. Site 3 offers views of the Sandia Mountains and the surrounding foothills to the east and Mt. Taylor and the Cities of Albuquerque and Rio Rancho to the west. See the photo log in Appendix C for pictures of Site 3. This site is visible from the residential development to the west.

5.4 Vegetation Communities

The COA MPOS Facility Plan (1999) Policy C.6.E states, "the restoration of native plant and animal communities shall include protection, enhancement, and retention of natural habitat. The objective is to restore native communities in each ecologic zone encompassed by the MPOS Network…". To comply with this policy, Tetra Tech biologists conducted a desktop and field assessment of the vegetation communities present within Site 1B and Site 3 to determine what types of vegetation communities are present on the sites, identify native vegetation present within the sites, and identify any invasive or weed species present within the sites.

Preliminary desktop analysis of the EnviroData-NM preliminary report indicated that the foothills region lies within the Sandia Mountains Important Plant Area. Important Plant Areas are known areas in New

Mexico that are either the last remaining location of endangered plants or areas that support a high density of sensitive plant species (NHNM 2022).

A preliminary review of the New Mexico Rare Plants Database determined that 10 New Mexico Rare Plants have the potential to occur within Bernalillo County (NMRPTC 1999):

- Santa Fe milkvetch (*Astragalus feensis*)
- La Jolla prairie clover (*Dalea scariosa*)
- Sapello Canyon larkspur (*Delphinium sapellonis*)
- Sandia coralbells (*Heuchera pulchella*)
- Todilto stickleaf (*Mentzelia todiltoensis*)
- Navajo muhly (*Muhlenbergia arsenei*)
- Ivey's twinpod (*Physaria iveyana*)
- Grama grass cactus (*Sclerocactus papyracanthus*)
- Plank's campion (*Silene plankii*)
- Great Plains ladies'-tresses (*Spiranthes magnicamporum*)

5.4.1 Native Vegetation

The Foothills Community and the Elena Gallegos Open Space are situated within the Conifer Woodlands and Savannas ecoregion, an EPA level IV ecoregion, which is a subset of the larger Arizona/New Mexico Mountains Level III ecoregion (USGS 2005). The Arizona/New Mexico Mountains are characterized by lower elevation mountain systems situated within dry and warm environments, with chaparral being associated with lower elevations, pinon-juniper woodlands with the mid elevations, and ponderosa forests with the higher elevations of this ecoregion. They are the northern extent of many plant and animal species and are commonly surrounded by deserts and grasslands. The Conifer Woodlands and Savannas ecoregion contains mostly pinyon-juniper woodlands but can often be found with dispersed grasslands and shrublands along with somewhat uniform winter and summer seasonal moisture regimes (Lowry et al. 2005; USGS 2005).

5.4.1.1 Site 1B

Site 1B and its associated 100-foot buffer covers approximately 2.34 acres of land. A desktop evaluation revealed that the site is situated within the Southern Rocky Mountain Pinyon Juniper Woodland plant community. This community commonly occurs within warm, dry sites on slopes, palteaus and ridges east of the continental divide in north-central New Mexico. The overstory of this community is typically dominated by either pinyon pine (*Pinus edulis*) or oneseed juniper (*Juniperus monosperma*) with a varying understory comprised of either shrubs, grasses, or bare ground. Some of the associated understory species include Bigelow sagebrush (*Artemisia bigelovii*), blue grama (*Bouteloua gracillis*), Arizona fescue (*Festuca arizonica*), and James' galleta (*Pleuraphis jamesii*). For a map of the spatial distribution of the vegetation community within Site 1B, see Figure 4.

Field assessments of Site 1B confirmed that the vegetation community is defined by a scattered pinyon-juniper woodland. This woodland consists of species such as oneseed juniper, pinyon pine and rubber rabbitbrush (*Ericameria nauseosa*). Site 1B also has a grassland component that is comprised of native species such as blue grama, hairy grama (*Bouteloua hirusta*), tobosagrass (*Hilaria mutica*), broadleaf milkweed (*Asclepias latifolia*), and mesa dropseed (*Sporobolus flexousus*) among others. For a full list

of plant species found within Site 1B, see Appendix A. No state of New Mexico Rare Plants were observed within Site 1B.

5.4.1.2 Site 3

Site 3 and its associated 100-foot buffer covers approximately 0.64 acres of land. A desktop evaluation revealed that the site is also situated within the Southern Rocky Mountain Pinyon Juniper Woodland plant community. This community commonly occurs within warm, dry sites on slopes, plateaus, and ridges east of the continental divide in north-central New Mexico. The overstory of this community is typically dominated by either pinyon pine (*Pinus edulis*) or oneseed juniper (*Juniperus monosperma*) with a varying understory comprised of either shrubs, grasses, or bare ground. Some of the associated understory species include Bigelow sagebrush (*Artemisia bigelovii*), blue grama (*Bouteloua gracillis*), Arizona fescue (*Festuca arizonica*), and James' galleta (*Pleuraphis jamesii*). For a map of the spatial distribution of the vegetation community within Site 3, see Figure 4.

The Field assessment of Site 3 also confirmed the presence of a scattered pinyon-juniper woodland with a grassland component. Species such as oneseed juniper, pinyon pine and rubber rabbitbrush also characterize the overstory, where present. The grassland component of this site contains species such as blue grama, squirrel tail (*Elymus elymoides*), needle and thread (*Hisperostipa comata*), false buffalograss (*Munroa squarrosa*), club cholla (*Corynopuntia clavata*), and tobosagrass among other species. For a full list of plant species found within Site 3, see Appendix A. No State of New Mexico Rare Plant species were observed within Site 3.

5.4.2 Weeds/Invasive Species

The State of New Mexico, under the administration of the NMDA, lists certain weed species as noxious (NMDA 2020). "Noxious" in this context refers to plants that are not native to New Mexico, that are targeted for management and control, and that have a negative impact on the economy or the environment. Class C listed weeds are common, widespread species that are well established in the state; Class B weeds are considered common but are not yet widespread in certain regions of the state; and Class A weeds have limited or no distribution in the state. Preventing new infestations of Class A species and eradicating their infestations is the highest priority. Class B species are found in limited portions of the state. In severe infestation areas, containing infestation and stopping further spread is the management goal. Class C species are widespread in the state, and their management decisions are determined at the local level, based on feasibility of control and infestation level.

The State of New Mexico also maintains a list of troublesome weeds that are not listed on the noxious weed list and include some plants that are native to the southwest but are known to invade crop systems, landscapes, rangelands, and pastures. While New Mexico acknowledges that not every plant species with the potential to negatively affect the environment is on this list, it does mention that early detection and treatment of weeds on this list are essential to minimize their impacts on the environment (Beck and Wanstall 2021).

5.4.2.1 Site 1B

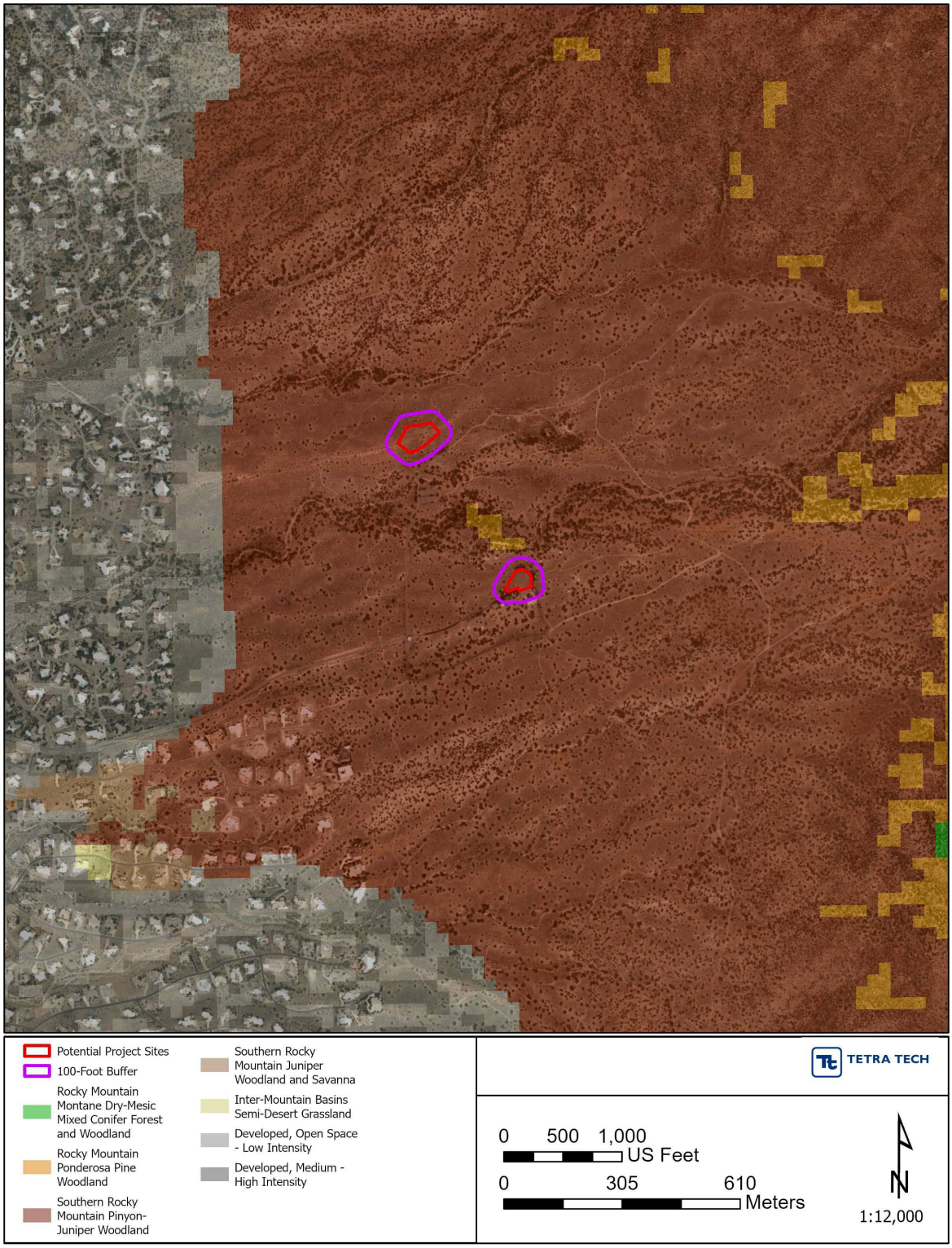
Site 1B was not found to contain any State of New Mexico designated noxious weed species. It did, however, contain one State of New Mexico listed troublesome weed, buffalo gourd (*Cucurbita foetidissima*). Buffalo gourd is a native species, but it is also known to invade disturbed soils in rangelands and pastures (Beck and Wanstall 2021).

Broom snakeweed (*Guterrizia sarothrae*) and silverleaf nightshade (*Solanum eleagnifolium*) were also detected within Site 1B. While both plants are native and are not listed by the State of New Mexico as noxious or troublesome weeds, an over-abundance of these species is considered an indicator of degraded rangeland conditions (Jameson 1970).

5.4.2.2 Site 3

Site 3 was also not found to contain any State of New Mexico designated noxious weed species. However, the site did contain white horehound (*Marrubium vulagare*), which is designated as a troublesome weed by the State of New Mexico. White horehound is a non-native species that is commonly found in disturbed sites (Beck and Wanstall 2021). Site 3 also contained both broom snakeweed and silverleaf nightshade.

Figure 4. Vegetation Communities Present within the Prospective Project Sites



5.5 Fish and Wildlife

The COA MPOS Facility Plan Policy B.1 States: "lands in the Sandia Foothills shall be acquired and managed to promote the purposes of MPOS as stated in the Comprehensive Plan with the following subgoals: (a) Conserve natural resources and environmental features including wildlife habitat and the mix of diversity of ecotones…"

Wildlife species commonly found within the foothills include coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), black bear (*Ursus americanus*), mule deer (*Odocoiles hemionus*), deer mice (*Peromyscus maniculatus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail rabbit (*Sylvilagus audubonii*), chipmunks (*Neotamias spp.*), Merriam's turkey (*Meleagris gallopavo merriami*), roadrunner (*Geococcyx californianus*), Texas horned lizard (*Phrynosoma conutum*), and many reptile, bird and small mammal species (NMDGF 2022). For a full list of species with the potential to occur within Bernalillo County see the Biota Information System of New Mexico species list for Bernalillo County in Appendix C.

The Elena Gallegos Open Space contains a natural spring and wetland known as the Cottonwood Springs Natural Preserve. Being the only natural water source in the immediate vicinity of the Elena Gallegos, it attracts large numbers of wildlife. It has likely contributed to the area being known locally as a birding hotspot with species such as American robin (*Turdus migratorius*), white-winged dove (*Zenaida asiatica*), western bluebird (*Sialia mexicana*), Cassin's finch (*Haemorhous cassinii*), dark-eyed junco (*Junco hymalis*) being commonly observed (eBird 2023). For a full list of avian species observed within the Elena Gallegos Open Space, see Appendix B.

5.5.1 Site 1B

Field surveys were conducted by Tetra Tech Biologists on October 18, 2022. Within Site 1B, only one wildlife species, a sage thrasher (*Oreoscoptes montanus*) was observed both visually and by call. One other species, coyote, was identified through scat present within Site 1B. During field surveys, multiple groups of hikers were present within the site. Their presence likely contributed to the lack of wildlife observations.

5.5.2 Site 3

At Site 3, a sage thrasher and a Woodhouse's scrub jay (*Apelocoma woodhouseii*) were observed. As with Site 1B, multiple groups of hikers walked through Site 3 while surveys were being conducted, which likely contributed to the lack of wildlife observations. While not detected within Site 3, an American robin was detected immediately outside of Site 3's buffer, suggesting that this species utilizes Site 3 as well.

There were no threatened, endangered, or sensitive plant or wildlife species located within the survey areas.

5.6 Endangered, Threatened and Special Status Species

Preliminary desktop analysis of the EnviroData-NM preliminary report revealed that the Foothills lies within a species of concern priority level 1 area. This means that federal or state threatened or endangered species, or Natural Heritage New Mexico Status ranking G1 species (critically imperiled globally or within New Mexico) have been observed (EnviroData-NM 2023).

Analysis of U.S. Fish and Wildlife Service (USFWS) critical habitat data reveals that the Elena Gallegos Open Space lies approximately 3 miles to the southwest from the nearest designated critical habitat, which is for the Mexican spotted owl and is designated by the nearby Sandia Mountain Wilderness (USFWS 2023).

Review of the New Mexico Department of Game and Fish (NMDGF) BISON-M report for Bernalillo County revealed that 16 Federal or State listed special status species have the potential to occur within Bernalillo County (NMDGF 2023). Additionally, review of the USFWS IPaC resource list revealed that six federal special status species have the potential to occur within the Elena Gallegos Open Space. See Table 2 for a list and evaluation of special status species considered for discussion.

Table 2. Special Status Species Considered.

Common Name	Scientific Name	Status	Habitat Present	Habitat Not Present	Habitat Requirements
Mammals					
New Mexico Meadow Jumping Mouse	*Zapus hudsonius leteus*	FE/SE		X	The subspecies mainly uses patches or narrow strips of riparian vegetation composed of well-developed tall (averaging at least 24 inches), dense riparian herbaceous vegetation primarily composed of sedges and forbs. This suitable habitat is found only when wetland vegetation achieves full growth potential associated with saturated soils along the edge of open, perennial flowing water.
Spotted Bat	*Euderma maculatum*	ST	X		The spotted bat is known to prefer subalpine conifer forests, particularly ponderosa pine forests, but has been known to inhabit pinyon-juniper woodlands. The species forages over streams or water holes.
Birds					
Aplomado Falcon	*Falco femoralis*	FE/SE	X		Variety of habitats including desert grasslands and open pine woodlands. Uses previously constructed stick nests located on woody plant material and utility poles. Species last known nesting in New Mexico was 1952.
Bald Eagle	*Haliaeetus leucocephalus*	BGEPA	X		Found near large bodies of water that support fish populations and waterfowl. They will perch and nest in tall deciduous or coniferous trees near water. During winter, birds will roost in more sheltered, warmer areas farther away from sources of food and feed in open water areas that support their primary food sources of fish and waterfowl. Avoids areas of human disturbance. Has been observed over the Elena Gallegos Open Space (eBird 2023).

Common Name	Scientific Name	Status	Habitat Present	Habitat Not Present	Habitat Requirements
Baird's Sparrow	*Centronyx bairdii*	ST	X		Areas of dense and expansive grasslands, with only a minor shrub component. Does not breed in New Mexico, but known to occur in Bernalillo County during non-breeding season
Bell's Vireo	*Vireo bellii*	ST		X	Known to occur in New Mexico in woodlands or dense shrublands along stream courses.
Broad-billed hummingbird	*Cyanthus latirostris*	ST		X	Found primarily in association with riparian woodlands in low to moderate elevations.
Common Black Hawk	*Buteogallus anthracinus*	ST		X	Known to occur in mature gallery riparian forests dominated by Fremont cottonwood and Arizona sycamore. Breeds along the Rio Grande in Bernalillo County where suitable habitat is present.
Gray Vireo	*Vireo vicinior*	ST	X		Found in dry woodlands, usually in association with steep, rocky, or rolling terrain. Open juniper woodlands are preferred. Winters south of Mexican border.
Least Tern	*Sternula antillarum*	SE		X	Known to nest on sand bars and shorelines and is associated with riverine and lacustrine environments.
Mexican Spotted Owl	*Strix occidentalis lucida*	FT		X	Spotted owls inhabit canyon and montane forest habitats and are residents of old-growth or mature forests with complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). In southern Arizona and New Mexico, the mixed conifer, Madrean pine-oak, Arizona cypress, encinal oak woodlands, and associated riparian forests provide habitat in the small mountain ranges distributed across the landscape. Owls are usually found in areas with some type of water source (i.e., perennial stream, creeks, and springs, ephemeral water, small pools from runoff, reservoir emissions). Canopy closure is typically greater than 40%. Owl foraging habitat includes a wide variety of forest conditions, canyon bottoms, cliff faces, tops of canyon rims, and riparian areas. (USFWS 2022b).
Neotropic Cormorant	*Phalacrocorax brasilianus*	ST		X	In New Mexico, it is found on larger bodies of water such as reservoirs. Uses stands of trees or shrubs near water and free of human disturbance.
Peregrine Falcon	*Falco peregrinus*	ST	X		Occupies a wide range of open habitats from tundra to desert mountains, including urban areas. Peregrines in New Mexico use mountains and river canyons for breeding.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE/SE		X	The Southwestern willow flycatcher (SWFL) is an obligate riparian species and nests in thickets associated with rivers, streams, and wetlands where dense growth of willow (*Salix* spp.), Russian olive (*Elaeagnus angustifolia)*, salt cedar (*Tamarix* spp.), or other plants are present (Finch and Stoleson 2000).

Common Name	Scientific Name	Status	Habitat Present	Habitat Not Present	Habitat Requirements
Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	FT		X	Wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. Nests often in willows along streams and rivers with nearby cottonwoods.
Fish					
Rio Grande Silvery Minnow	*Hybognathus amarus*	FE/SE		X	Inhabits low gradient, large streams with sandy or silty bottoms.
Insects					
Monarch Butterfly	*Danaus plexippus*	FC	X		Found throughout the United States. This orange and black butterfly lays eggs on milkweed (Asclepias spp.). In the United States, monarchs lay eggs, and the larva that hatch will continue the small migratory journeys to areas north after it becomes an adult. This is repeated in the fall as monarch move towards overwintering locations in the south (USFWS 2022a).

SE = State Endangered; ST = State Threatened; SR = State Rare Plant; FT = Federal Threatened; FE = Federal Endangered; FC = Federal Candidate; BGEPA = Bald and Golden Eagle Protection Act
Habitat and known occurrence data: NMDGF 2022 unless otherwise stated.

5.6.1 Site 1B

There were no state or federally protected threatened, endangered, or candidate species observed within Site 1B, nor were any other sensitive plant or wildlife species detected. However, within Site 1B, a small stand of broadleaf milkweed (*Asclepias latifolia*) was detected. As milkweed species are the sole source of food for the monarch butterfly (a federal candidate species), potential monarch butterfly habitat exists within Site 1B.

5.6.2 Site 3

There were no state or federally protected threatened, endangered, or candidate species located within Site 1B, nor were any other sensitive wildlife species detected.

5.7 Land Use

The City of Albuquerque Open Space Division mission statement states: "*The mission of the Open Space Division is to acquire and protect the natural character of land designated as Major Public Open Space in the City of Albuquerque Bernalillo County Comprehensive Plan. These lands are managed to conserve natural and archaeological resources, provide opportunities for outdoor education and low impact recreation, and define the edges of the urban environment*" (CABQ 1999).

The land use policies of the Sandia Foothills are dictated within the MPOS Facility plan (1999). Policies that are applicable for land use purposes include:

- Policy B.1(a) which states: "*Conserve natural resources and environmental features including wildlife habitat, and the mix and diversity of ecotones*"
- Policy B.1(b) which states: "*Provide opportunities for outdoor education and recreation including trails for a variety of users; picnicking and environmental education*"

- Policy B.1(d) which states: "*Provide trail corridors including access to Federally held lands and continuous north-south route along the base of the Sandias*"
- Policy B.3 which states: "*Existing facilities in the foothills may be expanded without development of an overall Resource Management plan for the Foothills…*"
- Policy C.1 which states: "*The conservation and protection of cultural and natural resources and protection of people from natural hazards related to development of steep slopes are the primary function of the Sandia Foothills. Recreational use and trail corridors are secondary to these functions.*"
- Policy C.3 which states: "*Large organized events (greater than 20 people) shall not be allowed in the Sandia Foothills without a permit from the Open Space Division. Facilities should be planned and designed to safely accommodate individuals, families, and small groups.*"
- Policy C.4 which states: "*The primary uses within the protected, undeveloped areas of the Sandia Foothills will be hiking, jogging, bicycling, equestrian use and other low impact recreation.*"
- Policy D.1 which states: "*… Use of the Elena Gallegos Picnic Area shall be controlled to conserve and sustain the natural resources of the area.*"
- Policy D.2 which states "*Overnight camping is not permitted in City owned land in the foothills without a use permit from the Open Space Division.*"

The MPOS Facility Plan also allows for special use areas. These are defined as areas that serve a unique function and are unique in the Public Open Space Trail (POST) network. Policy A.1.F states that these areas must serve an Open Space purpose and include facilities not allowable in other Open Space types but contribute to the overall needs of the Open Space Division. These areas must also comply with the Extraordinary Facilities Ordinance. Extraordinary facilities therefore must comply with the Integrated Development Ordinance Part 14-16-2-5(F)(3)(b) and the requirements for approval of an extraordinary facility described therein.

In addition, the Parks and Open Space comprehensive plan sets land use for open space property in Policy 10.3.3 which states: "*Use: Provide low-impact recreational and educational opportunities consistent with the carrying capacity of the Open Space Resource*".

The Elena Gallegos Open Space is currently utilized for hiking, mountain biking, and horseback riding as it provides several trail connections to the Cibola National Forest. In addition to these activities, the Elena Gallegos has seven covered picnic tables and two group sites available by reservation. It also contains a wildlife viewing blind at the Cottonwood Springs area and hosts a summer series that incorporates nature talks and live music at the amphitheater structure (CABQ 2022).

5.7.1 Site 1B

Site 1B is currently located near two trailheads which do not see as much utilization as other trailheads located within the Elena Gallegos. One of these trailheads is the only ADA accessible trail located within the Elena Gallegos, which is a well-maintained trail that leads to the Cottonwood Springs Area (CABQ 2022). In its current state, there is no direct vehicular access to the site as it lies approximately 125 feet from the nearest parking lot.

5.7.2 Site 3

Site 3 is located within and immediately adjacent to Loop Road and near 60 parking spaces, with access to the Pino trail head and the Nature Trail. The amphitheater and double picnic shelter also lie directly to the southwest of the site (CABQ 2022). The site is currently used by recreators to cross from the western parking lot to the Pino trailhead as evidenced by presence of many social trails. It is also used by helicopters involved in mountain rescue operations as a landing site (CABQ 2022).

5.8 Recreational Resources

The IDO states that part of the purpose of parks and open space zone districts is for public recreation, use, and enjoyment (CABQ 2021).

The Foothills Area has been the most visited of the City of Albuquerque's MPOS's since 1992, with its many trail connections that allow hikers, mountain bikers and equestrians to easily access the Cibola National Forest (CABQ 1999; CABQ 2022). One of the many trail connections to the Forest that is made through MPOS land is the Pino trail which begins in the Elena Gallegos and ends at the Sandia Crest Trail on top of the Sandia Mountains. This Open Space not only offers hiking, horseback riding and biking opportunities but, as previously mentioned, has an amphitheater that hosts nature talks and other programming, has several picnic areas and a group reservation site for day use purposes, and has a wildlife blind near the Cottonwood Springs area that has likely contributed to this area being considered a birding/wildlife viewing hotspot (CABQ 2022; eBird 2023).

5.8.1 Site 1B

Site 1B contains one trail, Trail 230a, which serves as a connection from the Foothills Trail to Trail 341, which connects the Domingo Baca Trail to the Pino Trail. It also contains three connecting trail which connect the parking lots to the south of the site to Trail 230a, and a trail that connects Trail 230a to the Domingo Baca Trail to the north. It also lies near the Cottonwood Springs trailhead, which, as mentioned previously is the only ADA accessible trailhead within Elena Gallegos. The trails located within Site 1B are utilized by hikers, equestrians, and mountain bikers. The Feasibility Study (2022) indicates that this area sees less use than areas located around Loop Road.

5.8.2 Site 3

Site 3 does not contain any official trails; however, it contains many social trails which lead from the parking lot to the west of the site to the Pino and Nature trail trailheads. It is also located adjacent to the Double Shelter picnic area and amphitheater which lie to the southwest of the site.

5.9 Public Health and Safety

Public health and safety are a major priority for the Open Space Division. Due to the Foothills region proximity to a large metropolitan area and to the inherent risks of outdoor recreation, visitor preparedness and safety are of paramount importance to COA OSD (CABQ 1999).

At the Elena Gallegos, public safety and health are maintained by providing staffing at the entrance to the Open Space, placing of pertinent safety messages on signage throughout the area, placing restrooms in high-use areas, and placing bear-proof trashcans to prevent wildlife from being habituated to humans.

Park staff are responsible for educating visitors about Open Space rules and regulations and for educating visitors about recreating responsibly on public lands.

5.9.1 Site 1B

The closest staffed area of the Elena Gallegos is approximately 0.4 miles away, at the entrance. The closest restroom facility is approximately 290 feet away, across the closest parking lot.

5.9.2 Site 3

The closest staffed area to Site 3 is the park entrance, which lies approximately 0.25 miles west of the site at the beginning of Loop Road. Site 3 is also currently used as a helipad for mountain rescue operations in the nearby Cibola National Forest. The nearest restrooms to Site 3 are located immediately across Loop Road from the site and to the northeast.

6 - Resource Evaluation of Potential Impact

6.1 Soils and Topography

As both sites sit on top of a small finger between two arroyos, soil erosion is a possible outcome of the construction of the education center. Disturbance should be kept to a minimum to comply with the MPOS best management practice (BMP) guidelines (Appendix H of the MPOS). It is recommended that disturbed sites be monitored for signs of erosion such as loose topsoil or the formation of drainage channels. If signs of soil erosion are observed, it is recommended that topsoil should be stabilized with the use of geotextiles, jute mesh stabilization, grama straw or gravel mulch in conjunction with reclamation seeding (CABQ 1999).

6.1.1 Site 1B

As mentioned in the Existing Conditions (Section 4 above), Site 1B currently contains two areas of active soil erosion (see Figure 2) along what appears in satellite imagery to be an old two track road which led to the corral that lies east of the site. To stabilize the soil and prevent further erosion, it is recommended that biotechnical means of erosion control such as reed rolls, and berms are utilized within the area of active erosion in conjunction with re-seeding the erosion site to re-stabilize the soil (CABQ 1999). OSD would ensure that sustainable mitigative erosion features are in place.

6.1.2 Site 3

Although no sites of active erosion were observed within Site 3, evidence of the impact of heavy use on this site are evident in the form of soil compaction due to the presence of several social trails. It is recommended that all social trails within Site 3 are closed to pedestrian traffic with signage, tilled to loosen the topsoil and re-seeded to prevent further degradation of soils due to foot traffic. No new additional trail alignments would be needed for use of the Site 3 area.

6.2 Hydrography, Hydrology, and Geomorphology

It is anticipated that construction activities at both sites will disturb the existing topsoil, making it more susceptible to water erosion. To prevent sedimentation of the existing swales and drainage areas present within each site, it is recommended that unvegetated topsoil be scarified or sediment mitigation measures such as berms or seeding of these areas are put in place to reduce stormwater runoff and prevent erosion (CABQ 1999), both during and immediately after construction.

It is also recommended to incorporate green stormwater infrastructure into the education center's design plans. Cisterns that collect water runoff from the facility roof could not only be used to water any vegetation beds incorporated into facility designs but they will also reduce the facility's water runoff. Permeable pavement such as paver stones or bricks could be utilized in lieu of concrete on walkways since the soils in the project sites are well drained. This will reduce runoff by increasing water infiltration in paved areas (COA 2023). This type of pavement is allowed by Part 14-16-5-6(C)(13)(e) of the IDO to assist with stormwater management.

6.2.1 Site 1B

As previously mentioned in the current conditions section two shallow swales exist within the 100-foot buffer of Site 1B, one to the north of the site, and one to the south. The southern swale is currently broken into two sections because of fill from the adjacent parking lot. It is recommended that the two sections of this swell are re-connected to ensure continuity of drainage within the swale and prevent future erosion issues.

It is recommended to avoid disturbance of the rock outcropping present within the 100-foot buffer of Site 1B as it is forbidden by Part 14-16-5-2(C)(2) of the IDO.

6.2.2 Site 3

As noted in the current conditions section, two culvert features exist within Site 3. It is recommended that disturbance of these culvert structures is avoided during construction activity to ensure proper drainage both from the site and the adjacent Loop Road. It is also recommended that sediment is cleared out of the culverts to restore full functionality and ability of these features to carry stormwater. If excess erosion is observed in the vicinity of these features, it is recommended that mitigation measures, such as those described previously in this section be taken.

6.3 Aesthetics

To maintain the aesthetic value of the Elena Gallegos Open Space and the Foothills area, it is recommended that education center designs incorporate the following which are also required by Part 14-16-5-2(J)(1) of the IDO for any development lots within 330 feet of a Major Public Open Space edge:

- As discussed in the vegetation communities' section below, only native vegetation should be used for landscaping materials.
- Screen all mechanical equipment from the public.
- All outdoor light fixtures should have a minimum intensity of 1 lumen per square foot of light coverage and no greater than two lumens per square foot of light coverage.

- All outdoor light fixtures should be shielded using full cutoff light fixtures.
- All outdoor lights should remain off between 11:00pm and sunrise, except for security purposes or for the illumination of walkways.
- Any light poles should not exceed 20 feet in height.
- All light fixtures should generate at least 80 lumens per watt of energy consumed, as shown by manufacturer specifications.
- All outdoor light fixtures mounted on the building should be mounted at least six feet and no more than 15 feet above grade or no higher than seven feet above the floor of a stoop or porch.
- Any decorative lighting should cast its light downward, not exceed 100 watts of incandescent luminance, and be turned off between 11:00pm and sunrise.
- Exterior surface colors of structures should be limited to a light reflective value between 20 and 50 percent and colors should blend with the surrounding natural environment.

6.3.1 Site 1B

If site 1B is selected to host the education center, the building would be visible from the neighborhood to the west of Elena Gallegos but would not block the neighborhood's view of the Sandia Mountains or the Foothills ecosystem from the neighborhood.

The education center would also be visible from Loop Road, although it would not interfere with any viewsheds from this area as well.

To minimize the impact of the education center to the aesthetics of Site 1B, it is recommended to follow the building requirements specified in Part 14-16-5-2(J)(1) of the IDO as described above.

6.3.2 Site 3

If Site 3 is selected to host the education center, the building would be visible from the neighborhood west of Elena Gallegos but would not block the neighborhood's view of the Sandia Mountains or the Foothills ecosystem from the neighborhood.

The education center would also be visible from Simms Park Road as it approaches and enters the Elena Gallegos but would not interfere with the viewsheds from the road either.

To minimize the impact of the education center to the aesthetics of Site 3, it is recommended to follow the building requirements laid down by Part 14-16-5-2(J)(1) of the IDO as described above.

6.4 Vegetation Communities

6.4.1 Native Vegetation

To maintain and improve the native plant community within the Elena Gallegos, it is recommended that any areas disturbed by proposed construction activities be reseeded. The seed mix should incorporate native plants commonly found within the Southern Rocky Mountain Pinyon-Juniper community such as blue grama, and galleta (*Pleuraphis jamesii*) as well as other species of native shrub and graminoids already found within the site such as hairy grama, purple threeawn (*Aristida purpurea*), sideoats grama (*Bouteloua curtipendula*), tobosagrass, mesa dropseed (*Sporobolus flexousus*), and rubber rabbitbrush

along with any other species common to the community that can be found in the foothills plant species list located in Appendix F of the MPOS facility plan (1999) or the City of Albuquerque Plant Palette (2018). Any trees and shrubs planted should adhere to the sizing requirements set forth in Part 14-16-5(C)(6) of the City of Albuquerque IDO (2022).

In addition to these species, it is recommended to incorporate broadleaf milkweed and other seed that will improve pollinator habitat such as white prairie clover (*Dalea candida*), James' buckwheat (*Eriogonum jamesii*), Palmer's penstemon (*Penstemon palmeri*), giant hyssop (*Agastache pallidiflora*), showy milkweed (*Asclepais subverticillata*), Riddell's sagewort (*Senecio reddellii*), copper globemallow (*Sphaeralcea angustifolia*), and MacDougal verbena (*Verbena macdougalii*), into any seed mix used to revegetate the construction site and other areas displaying signs of disturbance. This will help improve general pollinator and monarch butterfly habitat in addition to adding to the vegetative diversity of the chosen site (Kersten and Skidmore 2022).

It is also recommended to incorporate the seed mixes and shrub species into any landscaped areas such as flowerbeds or plant beds incorporated into facility designs. These beds could utilize rainwater harvesting from the roof of the proposed education center as a water source. Not only would this minimize landscaping water use, but it would also decrease runoff. If these type of landscaping features are incorporated into facility designs, the following is required by part 15-16-5 of the IDO:

- A minimum of at least two inches of organic mulch is required, although 3-4 inches is recommended.
- A mulch materiel should also be free of disease, insects, and invasive species.
- Vegetation should be planted in uncompacted soil.
- If used, weed barriers should be permeable to allow for stormwater infiltration and the minimization of runoff.

6.4.1.1 Site 1B

As identified in the current conditions section, broadleaf milkweed was detected within Site 1B. Milkweed is an important plant species for pollinators and is the sole food source for Monarch butterflies (*Danaus plexippus*). As such, stands of broadleaf milkweed should be spared from disturbance, when practical. If proposed construction activities impact areas containing broadleaf milkweed, it is recommended that disturbed soils are also planted with the native seed mixes that incorporate milkweed species mentioned above. If Site 1B is selected to host the education center, the present native plant community will likely be heavily disturbed by construction activities. It is recommended that any disturbed areas are seeded with the seed mixes to maintain and improve the native vegetation community within Site 1B.

6.4.1.2 Site 3

As noted in the current conditions section, no sensitive plant species were observed within Site 3. However, there were several areas of high use in the form of social trails noted. If Site 3 is selected to host the education center, the native vegetation community within Site 3 will likely be heavily disturbed by construction activities. It is recommended that any disturbed areas be seeded with the seed mixes to maintain and improve the native vegetation community within Site 3.

6.4.2 Weeds and Invasive Species

To maintain the quality of vegetative diversity and wildlife habitat it is essential to manage potentially problematic plant species. To do this, it is recommended to monitor disturbed areas for the emergence of noxious and problematic weeds. It is also recommended to minimize disturbance of soils whenever possible to prevent the spread of these species. When deemed necessary, herbicides can be used for control of these species on open space lands (CABQ 1999).

The presence of broom snakeweed and silverleaf nightshade in both Site 1B and 3 is of limited concern; however, the over-abundance of broom snakeweed is generally considered an indicator of degraded rangeland conditions (Jameson 1970). It is recommended that the overall proportion of this species in relation to the foliage cover of other species in the herbaceous strata, and the spatial spread and distribution of snakeweed, be monitored over time as a general indicator of the ecosystem integrity of Elena Gallegos Open Space.

To minimize the likelihood of the emergence of weeds and invasive species, the following Best Management Practices (BMPs) are recommended:

- Pre-treat areas with invasive and non-native species prior to construction activities.
- Minimize the amount and duration of construction to promote revegetation of disturbed areas.
- Minimize the amount and duration of disturbance in new areas containing problematic plant species.
- Implement daily equipment cleaning to reduce the transport of weed species.
- Use a designated area for cleaning tools, equipment, and vehicles.
- Remove soils and plant material from tools, equipment, and vehicles before entering and leaving the worksite.
    - Use a portable pressure washer to wash equipment.
- Inspect tools, equipment, and vehicles before entering and leaving the worksite.
- Use clothing, boots and gear that do not retain soil and plant material and that can be readily washed.
- Clean clothing, footwear, and other personal gear before leaving the worksite.
- Use designated areas for cleaning clothing, boots, and other personal gear.
- Select plant and other project materials that are from a certified weed-free source.
- Prevent invasive plant contamination of project materials when stockpiling and during transport.
- Designate waste disposal areas for invasive plant materials.
- Place invasive plant material into a secure container during transport off-site.
- Reseed and mulch disturbed areas as soon as possible with native grasses and forbs (like those mentioned in the section “native” section above) to prevent establishment of non-native and/or invasive vegetation species (as is required by Part 14-6-5 of the IDO)
- Use non-invasive plant material near the site for mulching and erosion control measures, this should also be free of disease and insects (per Part 16-6-5 of the IDO).

6.4.2.1 Site 1B

The presence of buffalo gourd within site is somewhat of concern as, if the buffalo gourd population within Site 1B is allowed to grow, large infestations of this species are difficult to control. As with silverweed nightshade and broom snakeweed, it is recommended that the overall proportion of this

species in relation to foliage cover of other herbaceous strata be monitored overtime. If infestation buffalo gourd grows within the site, it is recommended that they are treated with herbicides as it is effective in controlling the spread of the species. Physical removal of buffalo gourd is only successful if the entire taproot is removed from the ground (Beck and Wanstall 2021).

6.4.2.2 Site 3

The presence of white horehound is also somewhat of concern as it is not only a listed by the State of New Mexico as a troublesome weed, but it is also non-native and can spread rapidly. It is recommended that stands of white horehound are treated with herbicide as it is the most effective means of controlling this species (Beck and Wanstall 2021).

6.5 Wildlife

Due to the small scale of the proposed education center, the facility will likely have little impact on the wildlife present within Elena Gallegos.

Since surveys for this study were conducted outside of the bird nesting season, it is recommended that construction activities take place outside of migratory bird nesting season (March-August) or that avian surveys be conducted. As many birds and raptors may abandon their nests or roosting areas due to disturbance, if construction activities are to take place during nesting season, it is recommended that pre-construction nesting surveys are conducted to ensure that no nests are negatively impacted by construction. If nests are found, mitigation measures can be taken to minimize disturbance such as buffer zones or time of day construction activities are conducted (Jankowitz 2007).

Although impacts will likely be minimal there are several measures that can be taken to improve wildlife habitat available at either candidate site and reduce the impacts of the education center. These include:

- The installation of wildlife guzzlers. It is recommended to install wildlife guzzlers near the proposed education center. These guzzlers could use the rainwater harvesting systems installed on the building as a water source, making additional water collection infrastructure unnecessary. While guzzlers were originally designed for upland bird species, they can help reduce drought stress for all wildlife species during periods of drought (Wade 2021).
- The installation of bird nesting boxes. Due to the potential impact on cavity nesting bird habitat due to the clearing of individual trees within each site, it is recommended that bird nesting boxes are constructed in the vicinity of the education center. Not only would this provide additional educational opportunities do visitors, but it would also improve nesting habitat for cavity nesting birds within the Elena Gallegos Open Space. It is also recommended that, after installation, these boxes are monitored weekly to determine that they are not utilized by non-native species (such as European starling (*Sturnus vulgaris*)) or wasps, as birds will not nest in a box occupied by wasps (ODWC 2023).
- The installation of bat roosting boxes. While there was no bat roosting habitat located within the proposed site areas, there is potential bat habitat and use at the nearby Cottonwood Springs trail that leads to the Cottonwood Springs Wetland. To make improvements to potential bat habitat within the Elena Gallegos, it is recommended to install bat roosting boxes within the chosen project site, between the proposed education center and the nearby pond. Quality of roost sites has a heavy influence on the survival, reproduction, and overall fitness of individual bats.

Therefore, adding bat roosting boxes will not only improve bat habitat availability, but also help control insect populations (such as mosquitos) within the Elena Gallegos Open Space (Rueegger et al. 2016). After installation, bat boxes should be monitored for bat use 4-5 times (every two weeks) in the summer. Roost use can be determined based on the presence or absence of whitewash found in wire mesh catchments that can be attached to the roost box pole approximately 0.6m below the roost. If present, bat species should be identified when possible (Chambers et al. 2002). Species can also be identified by call with the aid of an echo meter.

- Facility window mitigation measure to deter bird collisions. Collision with windows has been found to be one of the leading causes of human-caused mortality of birds in the United States. To minimize the amount of bird mortalities because of bird impacts on the proposed education center's windows, it is recommended that facility designs incorporate patterns on windows with multiple markings spaced 2-4 inches apart, install external screens on windows, or keep blinds and curtains on the windows closed (Audubon 2023).
- The planting of native plant species including forbs and shrubs that will benefit pollinator species. The seed mixes mentioned in the native vegetation communities' section above will benefit pollinators such as butterfly species, bee species, and hummingbird species. Additionally, the planting of native forb and grass species will benefit native wildlife such as mule deer, black-tailed jackrabbit, and other herbivorous species, as well as providing ground cover for small mammals and native bird species.
- The installation of bear-proof trash cans. As bears are known to inhabit the foothills ecosystem, it is important to minimize bear-human conflict within the Elena Gallegos Open Space. Since most bear-human conflicts occur due to unsecured garbage, bear-proof trash cans would be an important tool to use to ensure that bear-human conflict is avoided in the Elena Gallegos. It is also recommended to refrain from placing any bird feeders in the vicinity of the proposed education center while bears are active, as these are also causes of bear-human conflict (NMDGF undated).

6.5.1 Site 1B

As Site 1B sees limited recreational use in comparison to other parts of the Elena Gallegos, it is expected that construction of an education center within Site 1B would result in increased use by recreators within the site and to the nearby Cottonwood Springs wildlife blind. This increase in disturbance will likely lead to less utilization of these areas by wildlife during operational hours.

6.5.2 Site 3

The construction of an education center at Site 3 would result in additional public use in the immediate vicinity of Site 3. This would also result in wildlife utilizing the area in the vicinity of the Pino Trailhead and the Nature Trail trailhead less frequently during operational hours.

6.6 Endangered, Threatened and Special Status Species

Impacts to both state and federal endangered threatened and special status species will likely be minimal due to the lack of species or potential habitat, with the exception of potential impacts to monarch butterfly habitat which will be further discussed in the Site 1B sub-section below (see Table 3 for a summary of probable impacts to special status species which have habitat within the potential project sites).

As mentioned in the wildlife section above, it is recommended that seed mixes utilized in re-vegetating disturbed sites incorporate seeds from pollinator species including broadleaf milkweed. The incorporation of broadleaf milkweed, or another native milkweed species will expand available habitat for the monarch butterfly, which is a federal candidate species, and other pollinator species. Other grass and forb species incorporated into this seed mix will also help create cover for ground nesting species such as the Baird's sparrow (a State of New Mexico threatened species).

Also as mentioned above, it is recommended that bat roosting boxes are installed within the proposed project sites. The placement of bat roosting boxes within sites would boost bat habitat quality and help mitigate any negative impacts that the proposed project may have on species such as the spotted bat (a State of New Mexico threatened species; Rueegger et al. 2016).

Since surveys were conducted outside of migratory bird nesting season, it is recommended that bird nesting surveys are conducted if the proposed project activities are to take place during migratory bird nesting season. This will ensure that species with potential nesting habitat within the project sites (such as the gray vireo) are not negatively impacted by project activities. If migratory bird nests are located, mitigation measures such as avoidance or disturbance buffers can be implemented (Jankowitz 2007).

Table 3. Probability of Effects on Special Status Species which have existing Habitat within the Proposed sites.

Common Name	Scientific Name	Status	Effects Probability
Mammals			
Spotted Bat	*Euderma maculatum*	ST	Low- While habitat exists within the proposed sites, no roosting areas were found within the sites.
Birds			
Aplomado Falcon	*Falco femoralis*	FE/SE	None- The species has not been known to nest in New Mexico since 1952 and has not been observed within the Elena Gallegos Open Space
Bald Eagle	*Haliaeetus leucocephalus*	BGEPA	Low- No nesting habitat exists within the proposed sites. The project will result in only minor impacts to a small area of foraging habitat.
Baird's Sparrow	*Centronyx bairdii*	ST	Low- While habitat exists within the proposed sites, no individuals were observed during site surveys. Since surveys occurred outside of migratory bird nesting season, nesting surveys are recommended during migratory bird nesting season (April-August) to determine presence of migratory bird nests.
Gray Vireo	*Vireo vicinior*	ST	Low- While habitat exists within the proposed sites, no individuals were observed during site surveys. Since surveys occurred outside of migratory bird nesting season, nesting surveys are recommended during migratory bird nesting season (April-August) to determine presence of migratory bird nests.
Peregrine Falcon	*Falco peregrinus*	ST	Low- No nesting habitat exists within either of the proposed sites. The project may result in only minor impacts to a small area of foraging habitat.
Insects			
Monarch butterfly	*Danaus plexippus*	FC	Moderate-The presence of broadleaf milkweed within Site 1B means habitat exists within that site. Construction activities in that site may destroy existing habitat.

SE = State Endangered; ST = State Threatened; FT = Federal Threatened; FE = Federal Endangered; FC = Federal Candidate; BGEPA = Bald and Golden Eagle Protection Act

6.6.1.1 Site 1B

As mentioned in the above, monarch butterfly (a federal candidate species) habitat exists within Site 1B due to the presence of broadleaf milkweed. A milkweed species are the sole source of food for monarch butterflies, it is recommended that stands of broadleaf milkweed are not disturbed to the greatest extent practical. In addition to this, as mentioned in sections above, it is recommended that broadleaf milkweed and other species that benefit pollinators is incorporated into the seed mix utilized to re-vegetate sites disturbed by construction activities and into any flower bed features that are incorporated into site designs.

No other state or federal threatened, endangered, or special status species were observed within Site 1B. However, as surveys were conducted outside of bird nesting season, it is recommended that pre-construction nesting surveys are conducted if disturbance activities related to the proposed education center are to take place during migratory bird nesting season, as mentioned in Section 5.5.

6.6.1.2 Site 3

No state or federal threatened, endangered, or special status species were observed within Site 3. However, as mentioned above, it is recommended that pre-construction nesting surveys are conducted if disturbance activities related to the proposed project are to take place during migratory bird nesting season.

6.7 Land Use

The Elena Gallegos Open Space, during its busiest periods, experiences vehicle congestion and the limited parking becomes full. A proposed education center may result in the need to construct additional parking (CABQ 2022a). This additional use may also have the side effect of generating more disturbance for native wildlife.

6.7.1 Site 1B

As there are known artifacts in the vicinity (but not the direct sites) and monarch butterfly habitat also located in the vicinity of Site 1B, the construction of an education center at this site may conflict with Policy B.1.D in the CABQ MPOS Facility Plan. This plan prohibits the development of new facilities in areas with archeological sites or likely contain habitats for threatened and endangered species (CABQ 1999; CABQ 2022). An archaeological survey would be conducted prior to final design to determine required buffers, if needed.

Additionally, while the monarch butterfly is a candidate species and not currently a threatened or endangered species, it is recommended that planners take the presence of monarch butterfly habitat within Site 1B in consideration when choosing a site for the education center.

MPOS Facility Plan policy B.1.D also states that facilities should be at the edges of MPOS in areas with access to urban streets. A paved street and parking lot do exist within the vicinity of Site 1B. Improvements would have to be made to the road where it crosses the Pino Arroyo. Parking is limited at this site, so construction of additional parking places or the expansion of the existing parking lot may have to be considered (CABQ 2022).

6.7.2 Site 3

There are no known archeological sites located within Site 3, however, to maintain compliance with Policy B.2.B. of the MPOS Facility Plan, it is recommended that a comprehensive archeological survey be conducted within Site 3 if it is chosen to host the education center.

As Site 3 is already located immediately adjacent to loop road, it would not be necessary to construct additional road infrastructure to access the site. However, Loop Road and the associated parking spaces are already known to become congested during busy times of the year. It may be necessary for the Open Space Division to explore the option of expanding existing parking lots or constructing new parking lots elsewhere within the Elena Gallegos to accommodate increases in parking demand (CABQ 2022).

6.8 Recreational Resources

A proposed education facility could afford the Open Space staff to better provide interpretive messages about the natural, cultural, and recreational values of the Sandia Mountains foothills through direct interaction or through interpretive media. Staff would also be better positioned to offer messages about safety and responsible recreation. The staff would also be better able to monitor visitor use and resource conditions.

As the Elena Gallegos area is already popular with recreationalists, any improvement in facilities or services could increase use of the area. Monitoring public use and resource conditions is an essential function of public land management. Adaptive management by land managers includes monitoring resource conditions, implementing mitigation tactics for resource protection, and educating the public about the values of public lands and appropriate behaviors on public lands.

The presence of an education center and staffing in an area more directly connected to the area of visitor use could provide better long-term preservation of the Foothills region.

6.8.1 Site 1B

The presence of an education center at Site 1B could increase the number of recreationalists in the vicinity of the nearby Cottonwood Springs wetland. This may result in seeing less utilization of the wetland by wildlife. If this site is chosen to host the education center, it is recommended that OSD post signs along the trail that leads to the wildlife blind advising the public to minimize wildlife disturbances and not feed wildlife in the area to help minimize the disturbance of wildlife at this sensitive site.

6.8.2 Site 3

The presence of an education center at Site 3 could result in additional utilization of the Pino and Nature Trails which are located near the site, additional trail maintenance and monitoring for the creation of social trails is recommended to prevent and minimize deterioration of trails and disturbance to adjacent sites.

6.9 Public Health and Safety

The construction of an education center at the Elena Gallegos could result in additional staffing at the facility, which would lead to a quicker response time to any issues that may arise in the area, leading to increased public safety. It is therefore recommended that the proposed education center is staffed during normal operating hours of the Elena Gallegos Open Space.

6.9.1 Site 1B

An education center at Site 1B would bring staff to a portion of the park that is almost a half mile away from the nearest staffed area (the entrance gate). This would enhance public safety at the site as well as bring additional restrooms to the area.

6.9.2 Site 3

An education center at Site 3 would bring additional staff and restrooms to the busiest area of the Elena Gallegos.

7 - Summary of Recommendations

7.1.1 Recommendations for Soils and Topography:

- It is recommended that disturbed sites be monitored for signs of erosion such as loose topsoil or the formation of drainage channels.
- If signs of soil erosion are observed, it is recommended that topsoil should be stabilized with the use of geotextiles, jute mesh stabilization, grama straw or gravel mulch in conjunction with reclamation seeding (CABQ 1999).
- To stabilize the soil and prevent further erosion, it is recommended that biotechnical means of erosion control such as reed rolls, and berms are utilized within the area of active erosion in conjunction with re-seeding the erosion site to re-stabilize the soil (CABQ 1999).
- It is recommended that all social trails within Site 3 are closed to pedestrian traffic with signage, tilled to loosen the topsoil and re-seeded to prevent further degradation of soils due to foot traffic.

7.1.2 Recommendations for Hydrography, Hydrology and Geomorphology

- It is recommended that unvegetated topsoil be scarified or sediment mitigation measures such as berms or seeding of these areas are put in place to reduce stormwater runoff and prevent erosion (CABQ 1999).
- It is also recommended to incorporate green stormwater infrastructure into the education center's design plans.
- It is recommended that the two section of the swale in site 1B are re-connected to ensure continuity of drainage within the swale and prevent future erosion issues.
- It is recommended to avoid disturbance of the rock outcropping present within the 100-foot buffer of Site 1B as it is forbidden by Part 14-16-5-2(C)(2) of the IDO.
- It is recommended that disturbance of the culvert structures within Site 3 is avoided during construction activity to ensure proper drainage both from the site and the adjacent Loop Road.
- It is also recommended that sediment is cleared out of the culvert structures in Site 3 to restore full functionality and ability of these features to carry stormwater.

7.1.3 Recommendations for Aesthetics

- As discussed in the vegetation communities' section below, only native vegetation should be used for landscaping materials.
- Screen all mechanical equipment from the public.
- All outdoor light fixtures should have a minimum intensity of one lumen per square foot of light coverage and no greater than two lumens per square foot of light coverage.
- All outdoor light fixtures should be shielded using full cutoff light fixtures.
- All outdoor lights should remain of between 11:00pm and sunrise, except for security purposes or for the illumination of walkways.
- Any light poles should not exceed 20 feet in height.
- All light fixtures should generate at least 80 lumens per watt of energy consumed, as shown by manufacturer specifications.

- All outdoor light fixtures mounted on the building should be mounted at least six feet and no more than 15 feet above grade or no higher than seven feet above the floor of a stoop or porch.
- Any decorative lighting should cast its light downward, not exceed 100 watts of incandescent luminance, and be turned off between 11:00pm and sunrise.
- Exterior surface colors of structures should be limited to a light reflective value between 20 and 50 percent and colors should blend with the surrounding natural environment.

7.1.4 Recommendations for Vegetation Communities

- In order to maintain and improve the native plant community within the Elena Gallegos, any areas disturbed by proposed construction activities areas are seeded with a native seed mix that incorporates native plants commonly found within the Southern Rocky Mountain Pinyon-Juniper community such as Bigelow sagebrush, blue grama, and galleta as well as other species of native shrub and graminoids already found within the site such as hairy grama, purple threeawn, sideoats grama, tobosagrass, mesa dropseed, and rubber rabbitbrush along with any other species common to the community that can be found in the foothills plant species list located in Appendix F of the MPOS facility plan (1999) or the City of Albuquerque Plant Palette (2018).
- It is recommended to incorporate broadleaf milkweed and other seed that will improve pollinator habitat such as white prairie clover (*Dalea candida*), James' buckwheat (*Eriogonum jamesii*), Palmer's penstemon, giant hyssop, showy milkweed, Riddell's sagewort, copper globemallow, and MacDougal verbena, into any seed mix used to revegetate the construction site and other areas displaying signs of disturbance.
- It is also recommended to incorporate the seed mixes and shrub species into any landscaped areas such as flowerbeds or plant beds incorporated into facility designs.
- It is recommended to incorporate the following into facility designs as they are required by the IDO:
    - A minimum of at least two inches of organic mulch is required, although 3-4 inches is recommended.
    - A mulch materiel should also be free of disease, insects, and invasive species.
    - Vegetation should be planted in uncompacted soil.
    - If used, weed barriers should be permeable to allow for stormwater infiltration and the minimization of runoff.
- Stands of broadleaf milkweed should be spared from disturbance, when practical.
- It is recommended that any disturbed areas are seeded with the seed mixes to maintain and improve the native vegetation community within Site 1B and 3.
- It is recommended to monitor disturbed areas for the emergence of noxious and problematic weeds. It is also recommended to minimize disturbance of soils whenever possible to prevent the spread of these species.
- It is recommended that the overall proportion of broom snakeweed in relation to the foliage cover of other species in the herbaceous strata, and the spatial spread and distribution of snakeweed, be monitored over time as a general indicator of the ecosystem integrity of Elena Gallegos Open Space.
- To minimize the likelihood of the emergence of weeds and invasive species, the following BMPs are recommended:

    - Pre-treat areas with invasive and non-native species prior to construction activities.

  - Minimize the amount and duration of construction to promote revegetation of disturbed areas.
  - Minimize the amount and duration of disturbance in new areas containing problematic plant species.
  - Implement daily equipment cleaning to reduce the transport of weed species.
  - Use a designated area for cleaning tools, equipment, and vehicles.
  - Remove soils and plant material from tools, equipment, and vehicles before entering and leaving the worksite.
    - Use a portable pressure washer to wash equipment.
  - Inspect tools, equipment, and vehicles before entering and leaving the worksite.
  - Use clothing, boots and gear that do not retain soil and plant material and that can be readily washed.
  - Clean clothing, footwear, and other personal gear before leaving the worksite.
  - Use designated areas for cleaning clothing, boots, and other personal gear.
  - Select plant and other project materials that are from a certified weed-free source.
  - Prevent invasive plant contamination of project materials when stockpiling and during transport.
  - Designate waste disposal areas for invasive plant materials.
  - Place invasive plant material into a secure container during transport off-site.
  - Reseed and mulch disturbed areas as soon as possible with native grasses and forbs (like those mentioned in the section "native" section above) to prevent establishment of non-native and/or invasive vegetation species (as is required by Part 14-6-5 of the IDO)
  - Use non-invasive plant material near the site for mulching and erosion control measures, this should also be free of disease and insects (per Part 16-6-5 of the IDO).
- It is recommended that the overall proportion of this buffalo gourd within Site 1B is monitored in relation to foliage cover of other herbaceous strata be monitored overtime. If infestation buffalo gourd grows within the site, it is recommended that they are treated with herbicides as it is effective in controlling the spread of the species.
- It is recommended that stands of white horehound are treated with herbicide as it is the most effective means of controlling this species (Beck and Wanstall 2021).

7.1.5 Recommendations for General Wildlife

- It is recommended that construction activities take place outside of migratory bird nesting season (March-August).
- If it is not feasible for construction activities to avoid taking place during migratory bird nesting season, it is recommended that pre-construction nesting surveys are conducted to ensure that no nests are negatively impacted by construction.
- The installation of wildlife guzzlers is recommended.
- The installation of bird nesting boxes is recommended.
- The installation of bat roosting boxes is recommended.
- It is recommended to install window mitigation measure to deter bird collisions.
- The installation of bear-proof trash cans is recommended.
- It is recommended to refrain from installing bird feeders at the site.

7.1.6 Recommendations for Endangered, Threatened and Special Status Species

- It is recommended that seed mixes utilized in re-vegetating disturbed sites incorporate seeds from pollinator species including broadleaf milkweed.
- It is recommended that bat roosting boxes are installed within the proposed project sites.
- It is recommended that bird nesting surveys are conducted if the proposed project activities are to take place during migratory bird nesting season.
- It is recommended that stands of broadleaf milkweed are not disturbed to the greatest extent practical.

7.1.7 Recommendations for Land Use

- It is recommended that a comprehensive archeological survey be conducted within Site 1B and 3 to determine if archeological sites are present within either site this is also required by Policy B.2.B (CABQ 1999).
- It is recommended that planners take the presence of monarch butterfly habitat within Site 1B in consideration when choosing a site for the education center.
- It is recommended that the Open Space Division explores the option of expanding existing parking lots or constructing new parking lots elsewhere within the Elena Gallegos Open Space so that the open space can accommodate increases in parking demand (CABQ 2022).

7.1.8 Recommendations for Recreational Resources

- It also recommended that Open Space increase trail maintenance of trails on the Elena Gallegos Open Space to compensate for the increased use that trails within the open space may experience.
- It is recommended that, where social trails are created, they are closed and revegetated to prevent future erosional problems, prevent soil compaction, and reduce the likelihood of the appearance of invasive or noxious weeds.
- It is recommended that open space post signs along the trail that leads to the wildlife blind on the Cottonwood Springs reserve advising the public to minimize wildlife disturbances and not feed wildlife in the area.

7.1.9 Recommendations for Public Safety

- It is recommended that the proposed education center is staffed during normal operating hours of the Elena Gallegos Open Space.

8 - References

Audubon. 2023. Bird Friendly Communities Reducing Collisions with Glass Creating Visual Cues. Available online at: https://www.audubon.org/news/reducing-collisions-glass. Accessed March 2023.

Beck, L. and Wanstall, J. 2021. Noxious and Troublesome Weeds of New Mexico, Cooperative Extension Service Circular 698. College of Agricultural, Consumer and Environmental Sciences, New Mexico state University.

City of Albuquerque (CABQ). 1999. City of Albuquerque Major Public Open Space (MPOS) Facility Plan. City of Albuquerque Open Space Division.

CABQ. 2018. Official Albuquerque Plant Palette and Sizing List. Available online at: https://documents.cabq.gov/planning/UDD/Official%20Albuquerque%20Plant%20Palette%20and%20Sizing%20List-2018-07-03.pdf. Accessed March 2023.

CABQ 2022a. Integrated Development Ordinance December 2022 Effective Draft. City of Albuquerque Code of Ordinances Chapter 14 – Zoning, Planning, and Building, Article 16.

CABQ. 2023a. IDO Interactive Map. City of Albuquerque Integrated Development Ordinance. Available online at: https://cabq.maps.arcgis.com/apps/webappviewer/index.html?id=53bf716981b14d25a31e7a2549c2d61b.

CABQ. 2023b. City of Albuquerque Parks & Recreation Elena Gallegos Open Space Web Page. Available online at: https://www.cabq.gov/parksandrecreation/open-space/lands/elena-gallegos-open-space. Accessed March 2023.

City of Raleigh (COR). 2023. Advancing Use of Green Stormwater Infrastructure, bringing more green, eco-friendly features to Raleigh that help protect waterways. City of Raleigh Stormwater Program. Available online at https://raleighnc.gov/stormwater/advancing-use-green-stormwater-infrastructure. Accessed March 2023.

Connel, S.D. 1996. Quaternary Geology and Geomorphology of the Sandia Mountains Piedmont, Central New Mexico. Open File Report 425. New Mexico Bureau of Mines and Mineral Resources. Socorro, New Mexico 87801.

Dekker, Perich and Sabatini. 2022. Elena Gallegos Open Space Education Center Feasibility Study. City of Albuquerque Open Space Division.

eBird. 2023. eBird: an Online database of bird distribution and abundance. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available online at: http://www.ebird.org. Accessed March 2023.

Jameson, D.A. 1970. Value of broom snakeweed as a range condition indicator. Journal of Range Management, 23, 302-304.

Jankowitz, R. 2007. Oil and Gas Development Guidelines, Conserving New Mexico's Wildlife Habitats and Wildlife. New Mexico Department of Game and Fish. Available online at: https://www.wildlife.state.nm.us/download/conservation/habitat-handbook/Oil-and-gas-develelopment-guidelines.pdf. Accessed March 2023.

Kersten, M. L. and Stickmore, A. 2022. Perennial Plants for Pollinators in New Mexico, Guide H-182. College of Agricultural, Consumer and Environmental Sciences. New Mexico State University Cooperative Extension Service. Available at: https://pubs.nmsu.edu/_h/H182/index.html. Accessed December 2022.

Natural Resources Conservation Service (NRCS). 2023. Web Soil Survey. Available online at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed February 2023.

New Mexico Department of Agriculture (NMDA). 2020. New Mexico Noxious Weed List Update. Memorandum dated July 2, 2020. New Mexico State University, Las Cruces, NM.

New Mexico Department of Game and Fish (NMDGF). 2022a. Biota Information System of New Mexico (BISON-M). Available online at http://www.bison-m.org/. Accessed October 2022.

NMDGF. Undated. Keeping Bears Alive and Yourself Safe, Guide to Living and Visiting Bear Country. Available online at: https://www.wildlife.state.nm.us/download/publications/wildlife/Keeping-Bears-Alive-and-You-Safe.pdf. Accessed March 2023.

New Mexico Rare Plant Technical Council (NMRPTC). 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. Available online at https://nmrareplants.unm.edu (Latest update: 19 Oct 2020). Accessed October 2022.

Oklahoma Department of Wildlife Conservation (ODWC). 2023. Woodworking for Wildlife: Nest Boxes. Available online at: https://www.wildlifedepartment.com/outdoorok/ooj/woodworking-wildlife-nest-boxes. Accessed March 2023.

United States Fish and Wildlife Service (USFWS). 2022a. IPaC (Information, Planning, and Compliance) Resource report. Available at http://ecos.fws.gov/ipac/. Accessed October 2022.

USFWS. 2022b. National Wetlands Inventory Mapper. Available online at: https://www.fws.gov/wetlands /index.html. Accessed October 2022.

USFWS. 2023. USFWS Threatened and Endangered Species Active Critical Habitat Report. Available online at: https://ecos.fws.gov/ecp/report/table/critical-habitat.html. Accessed March 2023.

United States Geological Survey (USGS). 2022. National Hydrography Dataset. Available at http://nhd.usgs.gov/ (last modified 19, April 2018). Accessed October 2022.

Wade, P and Schlick, K. 2021. Guzzlers: Watering Holes for Thirsty Wildlife. United States Department of Agriculture, United States Forest Service, Pacific Southwest Regional Office, Inyo National Forest. Available online at:

https://www.fs.usda.gov/detailfull/r5/home/?cid=FSEPRD987296&width=full. Accessed: March 2013.

APPENDIX A: LIST OF PLANT SPECIES OBSERVED

Life Form	Scientific Name	Common Name	Location	Native (Y/N)
Forb	*Asclepias latifolia*	Broadleaf milkweed	Site 1B only	Y
Forb	*Bassia scoparia*	Kochia	Both sites	Y
Forb	*Cirsium ochrocentrum*	Yellowspine Thistle	Both sites	Y
Forb	*Cucurbita foetidissima*	Buffalo Gourd	Site 1B only	Y
Forb	*Fallugia paradoxa*	Apache Plume	Site 1B only	Y
Forb	*Glandularia bipinnatifida*	Dakota Mock	Site 1B only	Y
Forb	*Guterrizia sarothrae*	Broom Snakeweed	Both Sites	Y
Forb	*Marrubium vulgare*	White Horehound	Site 3 only	N
Forb	*Mentzelia multiflora*	Adonis blazingstar	Site 1B only	Y
Forb	*Solanum eleagnifolium*	Silverleaf Nightshade	Both Sites	Y
Forb	*Verbascum thapsus*	Common Mullen	Site 3 only	N
Grass	*Arisitida purpurea*	Purple threeawn	Both sites	Y
Grass	*Bothriochloa barbinodis*	Cane Bluestem	Site 3 only	Y
Grass	*Bouteloua curtipendula*	Sideoats Grama	Both Sites	Y
Grass	*Bouteloua eriopoda*	Black Grama	Both Sites	Y
Grass	*Bouteloua gracilis*	Blue Grama	Both Sites	Y
Grass	*Bouteloua hirusta*	Hairy grama	Both Sites	Y
Grass	*Elymus elymoides*	Squirrel Tail	Site 3 only	Y
Grass	*Hesperostipa comata*	Needle and Thread	Site 3 only	Y
Grass	*Hilaria mutica*	Tobosagrass	Both sites	Y
Grass	*Lycurus setosus*	Bristly wolfstail	Both sites	Y
Grass	*Muhlenbergia pungens*	Sand Muhly	Site 1B only	Y
Grass	*Munroa squarrosa*	False Buffalograss	Both sites	Y
Grass	*Sporobolus airoides*	Alkali Sacaton	Site 3 only	Y
Grass	*Sporobolus compositus*	Tall Dropseed	Both sites	Y
Grass	*Sporobolus flexousus*	Mesa Dropseed	Both sites	Y
Succulent	*Corynopuntia clavata*	Club Cholla	Both sites	Y
Succulent	*Cylindropuntia imbricata*	Tree Cholla	Both sites	Y
Succulent	*Opuntia engelmannii*	Prickly Pear	Both sites	Y
Succulent	*Yucca glauca*	Soapweed Yucca	Both sites	Y
Tree/Shrub	*Ericameria nauseosa*	Rubber Rabbitbrush	Both sites	Y
Tree/Shrub	*Jiniperus monosperma*	Oneseed Juniper	Both sites	Y
Tree/Shrub	*Marrubium vulgare*	White horehound	Site 3 only	N
Tree/Shrub	*Pinus edulis*	Pinyon Pine	Both sites	Y
Tree/Shrub	*Prunus persica*	Peach Tree	Site 3 only	N

APPENDIX B: LIST OF AVIAN SPECIES OBSERVED BY BIRDERS AT THE ELENA GALLEGOS OPEN SPACE

Common Name	Scientific Name
Cooper's Hawk	*Accipiter cooperii*
Northern Goshawk	*Accipiter gentilis*
Sharp-shinned Hawk	*Accipiter striatus*
White-throated Swift	*Aeronautes saxatalis*
Red-winged Blackbird	*Agelaius phoeniceus*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Black-throated Sparrow	*Amphispiza bilineata*
Mallard	*Anas platyrhynchos*
Woodhouse's Scrub Jay	*Aphelocoma woodhouseii*
Golden Eagle	*Aquila chrysaetos*
Black-chinned Hummingbird	*Archilochus alexandri*
Great Blue Heron	*Ardea herodias*
Juniper Titmouse	*Baeolophus ridgwayi*
Cedar Waxwing	*Bombycilla cedrorum*
Canada Goose	*Branta canadensis*
Great Horned Owl	*Bubo virginianus*
Red-tailed Hawk	*Buteo jamaicensis*
Swainson's Hawk	*Buteo swainsoni*
Common Black Hawk	*Buteogallus anthracinus*
Gamblel's Quail	*Callipepla gambelii*
Scaled Quail	*Callipepla squamata*
Cactus Wren	*Campylorhynchus brunneicapillus*
Wilson's Warbler	*Cardellina pusilla*
Turkey Vulture	*Cathartes aura*
Hermit Thrush	*Catharus guttatus*
Canyon Wren	*Catherpes mexicanus*
Brown Creeper	*Certhia americana*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Common Nighthawk	*Chordeiles minor*
Northern Harrier	*Circus cyaneus*
Marsh Wren	*Cistothorus palustris*
Evening Grosbeak	*Coccothraustes vespertinus*
Northern Flicker	*Colaptes auratus*
Rock Pidgeon	*Columba livia*
Olive-sided Flycatcher	*Contopus cooperi*
Greater Pewee	*Contopus pertinax*
Western Wood-Pewee	*Contopus sordidulus*

Common Name	*Scientific Name*
Townsend's Solitare	*Myadestes townsendi*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Clark's Nutcracker	*Nucifraga columbiana*
Sage Thrasher	*Oreoscoptes montanus*
Ruddy Duck	*Oxyura jamaicensis*
Osprey	*Pandion haliaetus*
House Sparrow	*Passer domesticus*
Savannah Sparrow	*Passerculus sandwichensis*
Lazuli Bunting	*Passerina amoena*
Blue Grosbeak	*Passerina caerulea*
Indigo Bunting	*Passerina cyanea*
Band-tailed Pidgeon	*Patagioenas fasciata*
Cliff Swallow	*Petrochelidon pyrrhonota*
Double-crested Cormorant	*Phalacrocorax auritus*
Common Poorwill	*Phalaenoptilus nuttallii*
Ring-necked Pheasant	*Phasianus colchicus*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Downy Woodpecker	*Picoides pubescens*
Green-tailed Towhee	*Pipilo chlorurus*
Spotted Towhee	*Pipilo maculatus*
Hepatic Tanager	*Piranga flava*
Western Tanager	*Piranga ludoviciana*
Pied-billed Grebe	*Podilymbus podiceps*
Black-capped Chickadee	*Poecile atricapillus*
Mountain Chickadee	*Poecile gambeli*
Blue-gray gnat catcher	*Polioptila caerulea*
Vesper Sparrow	*Pooecetes gramineus*
Bushtit	*Psaltriparus minimus*
Great-tailed Grackle	*Quiscalus mexicanus*
Ruby-Crowned Kinglet	*regulus calendula*
Golden-crowned kinglet	*Regulus satrapa*
Rock Wren	*Salpinctes obsoletus*
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
Broad-tailed Hummingbird	*Selasphorus platycercus*
Rufous Hummingbird	*Selasphorus rufus*
Yellow-rumped Warbler	*Setiphaga coronata*
Grace's Warbler	*Setophaga graciae*

Common Name	Scientific Name
Chihuahuan Raven	*Corvis cryptoleucus*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Steller's Jay	*Cyanocitta stelleri*
Ladder-backed Woodpecker	*Dryobates scalaris*
Dusky Flycatcher	*Empidonax oberholseri*
Cordilleran Flycatcher	*Empidonax occidentalis*
Gray Flycatcher	*Empidonax wrightii*
Merlin	*Falco columbarius*
Prairie Falcon	*Falco mexicanus*
Peregrine Falcon	*Falco peregrinus*
American Kestrel	*Falco sparverius*
American Coot	*Fulica americana*
Wilson's Snipe	*Gallinago delicata*
Greater Roadrunner	*Geococcyx californianus*
MacGillivray's Warbler	*Geothlypis tolmiei*
Common Yellowthroat	*Geothlypis trichas*
Sandhill Crane	*Grus canadensis*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Cassin's Finch	*Haemorhous cassinii*
House Finch	*Haemorhous mexicanus*
Bald Eagle	*Haliaeetus leucocephalus*
Barn Swallow	*Hirundo rustica*
Bullock's Oriole	*Icterus bullockii*
Scott's Oriole	*Icterus parisoum*
Dark-eyed Junco	*Junco hyemalis*
Virginia's Warbler	*Leiothlypis virginiae*
Hairy Woodpecker	*Leuconotopicus villosus*
Red Crossbill	*Loxia curvirostra*
American Widgeon	*Mareca americana*
Gadwall	*Mareca strepera*
Belted Kingfisher	*Megaceryle alcyon*
Western Screech-Owl	*Megascops kennicottii*
Acorn Woodpecker	*Melanerpes formicivorus*
Wild Turkey	*Meleagris gallopavo meriami*
Swamp Sparrow	*Melospiza georgiana*
Lincoln's Sparrow	*Melospiza lincolnii*
Song Sparrow	*Melospiza melodia*
Canyon Towhee	*Melozone fusca*
Northern Mockingbird	*Mimus plyglottos*
Brown-headed Cowbird	*Molothrus ater*
Source: eBird 2023	

Common Name	*Scientific Name*
Black-throated Gray Warbler	*Setophaga nigrescens*
Yellow Warbler	*Setophaga petechia*
Townsend's Warbler	*Setophaga townsendi*
Mountain bluebird	*Sialia currucoides*
Western bluebird	*Sialia mexicana*
Eastern Bluebird	*Sialia sialis*
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Pygmy Nuthatch	*Sitta pygmaea*
Northern Shoveler	*Spatula clypeata*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Williamson's Sapsucker	*Sphyrapicus throideus*
Pine Siskin	*Spinus pinus*
Lesser Goldfinch	*Spinus psaltria*
American Goldfinch	*Spinus tristis*
Black-chinned Sparrow	*Spizella astrogularis*
Brewer's Sparrow	*Spizella breweri*
Clay-colored Sparrow	*Spizella pallida*
Chipping Sparrow	*Spizella passerina*
American Tree Sparrow	*Spizelloides arborea*
Northern rough-winged Swallow	*Stelgidopteryx serripennis*
Eurasian Collared-Dove	*Streptopelia decaocto*
Western Meadowlark	*Strurnella neglecta*
European Starling	*Sturnus vulgaris*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Bewick's Wren	*Thryomanes bewickii*
Crissal Thrasher	*Toxostoma crissale*
Curve-billed Thrasher	*Toxostoma curvirostre*
House Wren	*Troglodytes aedon*
American robin	*Turdus migratorius*
Western Kingbird	*Tyrannus verticalis*
Cassin's Kingbird	*Tyrannus vociferans*
Orange-crowned Warbler	*Vermivora celata*
Cassin's Vireo	*Vireo cassinii*
Warbling Vireo	*Vireo gilvus*
Plumbeous Vireo	*Vireo plumbeus*
White-winged Dove	*Zenaida asiatica*
Mourning Dove	*Zenaida macroura*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
White-crowned Sparrow	*Zonotrichia leucophrys*
Source: eBird 2023	

Common Name	Scientific Name

Common Name	*Scientific Name*

APPENDIX C: PHOTOGRAPHS TAKEN DURING THE SURVEY

Photograph 1. Western Section of Vegetated Swale.

Photograph 2. Eastern Section of Vegetated Swale.

Photograph 3. Erosional Feature within Site 1B.

Photograph 4. Erosional Feature within the 100ft. Buffer of Site 1B

Photograph 5. Rock Outcrop within the 100ft. Buffer of Site 1B.

Photograph 6. Swale Feature within Northern Buffer of Site 1B.

Photograph 7. Representative Photograph of Site 1B Looking North

Photograph 8. Representative Photograph of Site 3 Looking Southwest.

Photograph 9. Photograph of Northern Culvert at Site 3.

Photograph 10. Photograph of Eastern Portion of Culvert Structure at Site 3.

APPENDIX D: BISON-M REPORT FOR BERNALILLO COUNTY

All Species
Bernalillo

Taxonomic Group	# Species	Taxonomic Group	# Species
Amphibians	11	Birds	328
Coleoptera; beetles	18	Fish	24
Hymenoptera; ants, bees, wasps	1	Lepidoptera; moths and butterflies	138
Mammals	87	Misc. Arachnids	20
Molluscs	25	Myriapoda; centipedes, millipedes, etc.	2
Odonata; dragonflies	48	Orthoptera; grasshoppers & crickets	89
Reptiles	54	Spiders	24

TOTAL SPECIES: 869

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Black-tailed Jackrabbit	Lepus californicus					View
Desert Cottontail Rabbit	Sylvilagus audubonii					View
Holzner's Cottontail Rabbit	Sylvilagus holzneri holzneri; robustus					No Photo
Crawford's Desert Shrew	Notiosorex crawfordi					View
Merriam's Shrew	Sorex merriami					No Photo
Dusky Shrew	Sorex monticola					No Photo
Dwarf Shrew	Sorex nanus					View
Big Free-tailed Bat	Nyctinomops macrotis					No Photo
Brazilian Free-tailed Bat	Tadarida brasiliensis					View
Hoary Bat	Aeorestes cinereus					No Photo
Pallid Bat	Antrozous pallidus					View
Pale Townsend's Big-eared Bat	Corynorhinus townsendii				Y	View
Big Brown Bat	Eptesicus fuscus					No Photo
Spotted Bat	Euderma maculatum	T			Y	View
Silver-haired Bat	Lasionycteris noctivagans					No Photo
Southwestern Myotis	Myotis auriculus					No Photo
California Myotis	Myotis californicus					No Photo
Western Small-footed Myotis	Myotis ciliolabrum					View
Southwestern Little Brown Myotis	Myotis occultus					No Photo
Fringed Myotis	Myotis thysanodes					View
Long-legged Myotis	Myotis volans					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Yuma Myotis	Myotis yumanensis					View
Canyon Bat	Parastrellus hesperus					View
Coyote	Canis latrans					View
Common Gray Fox	Urocyon cinereoargenteus					View
Kit Fox	Vulpes macrotis					View
Red Fox	Vulpes vulpes					View
Bobcat	Lynx rufus					View
Mountain Lion	Puma concolor					View
Common Hog-nosed Skunk	Conepatus leuconotus					View
Striped Skunk	Mephitis mephitis					View
Western Spotted Skunk	Spilogale gracilis					View
Ermine Weasel	Mustela richardsonii					No Photo
Long-tailed Weasel	Neogale frenata					View
American Badger	Taxidea taxus					View
Ringtail	Bassariscus astutus					View
Common Raccoon	Procyon lotor					View
Black Bear	Ursus americanus					View
Pronghorn	Antilocapra americana americana					View
Rocky Mtn. Bighorn Sheep	Ovis canadensis canadensis					View
Elk	Cervus canadensis nelsoni					View
Mule Deer	Odocoileus hemionus					View
American Beaver	Castor canadensis					View
Long-tailed Vole	Microtus longicaudus longicaudus; alticola; baileyi; mordax					No Photo
Mogollon Vole	Microtus mogollonensis guadalupensis; mogollonensis					No Photo
White-throated Woodrat	Neotoma albigula					View
White-toothed woodrat	Neotoma leucodon					View
Mexican Woodrat	Neotoma mexicana mexicana; inopinata; pinetorum; scopulorum					No Photo
Southern Plains Woodrat	Neotoma micropus canescens					No Photo
Common Muskrat	Ondatra zibethicus pallidus; osoyooensis; cinnamominus					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Chihuahua Grasshopper Mouse	Onychomys arenicola arenicola					No Photo
Northern Grasshopper Mouse	Onychomys leucogaster					No Photo
Brush Mouse	Peromyscus boylii					No Photo
Cactus Mouse	Peromyscus eremicus anthonyi; eremicus					View
White-footed Mouse	Peromyscus leucopus					View
Deer Mouse	Peromyscus maniculatus					No Photo
Northern Rock Mouse	Peromyscus nasutus					No Photo
Pinyon Mouse	Peromyscus truei					No Photo
Tawny-bellied Cotton Rat	Sigmodon fulviventer minimus					No Photo
Hispid Cotton Rat	Sigmodon hispidus berlandieri; confinis; texianus					View
Western Harvest Mouse	Reithrodontomys megalotis megalotis; aztecus					No Photo
Plains Harvest Mouse	Reithrodontomys montanus					No Photo
Meadow Jumping Mouse	Zapus luteus luteus	E	E	Y	Y	View
Nutria	Myocastor coypus					No Photo
Common Porcupine	Erethizon dorsatum					View
Yellow-faced Pocket Gopher	Cratogeomys castanops					No Photo
Botta's Pocket Gopher	Thomomys bottae					No Photo
Hispid Pocket Mouse	Chaetodipus hispidus					No Photo
Rock Pocket Mouse	Chaetodipus intermedius intermedius; crititus; phasma; umbrosus					No Photo
Merriam's Kangaroo Rat	Dipodomys merriami					View
Ord's Kangaroo Rat	Dipodomys ordii					View
Banner-tailed Kangaroo Rat	Dipodomys spectabilis baileyi; clarencei; spectabilis					No Photo
Plains Pocket Mouse	Perognathus flavescens					No Photo
Silky Pocket Mouse	Perognathus flavus flavus; hopiensis					No Photo
House Mouse	Mus musculus					View
Norway Rat	Rattus norvegicus					No Photo
Texas Antelope Squirrel	Ammospermophilus interpres					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
White-tailed Antelope Squirrel	Ammospermophilus leucurus					View
Gunnison's prairie dog	Cynomys gunnisoni				Y	View
Rock Squirrel	Otospermophilus variegatus grammurus					View
Abert's Squirrel	Sciurus aberti aberti; chuscensis; ferreus					View
Cliff Chipmunk	Neotamias dorsalis					View
Least Chipmunk	Neotamias minimus atristriatus; operarius; chuskaensis					View
Colorado Chipmunk	Neotamias quadrivittatus quadrivittatus; australis; oscuraensis					View
Red Squirrel	Tamiasciurus fremonti					No Photo
Red Squirrel	Tamiasciurus hudsonicus lychnuchus; mogollonensis					View
Spotted Ground Squirrel	Xerospermophilus spilosoma					No Photo
Greater White-fronted Goose	Anser albifrons					View
Snow Goose	Anser caerulescens					View
Ross's Goose	Anser rossii					View
Canada Goose	Branta canadensis					View
Cackling Goose	Branta hutchinsii					View
Wood Duck	Aix sponsa					View
Northern Shoveler Duck	Spatula clypeata					View
Cinnamon Teal Duck	Spatula cyanoptera					View
Blue-winged Teal Duck	Spatula discors					View
American Wigeon Duck	Mareca americana					View
Gadwall Duck	Mareca strepera					View
Mallard Duck	Anas platyrhynchos					View
Mexican Duck	Anas diazi					No Photo
Northern Pintail	Anas acuta					View
Green-winged Teal Duck	Anas crecca					View
Canvasback Duck	Aythya valisineria					View
Redhead Duck	Aythya americana					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Ring-necked Duck	Aythya collaris					View
Greater Scaup Duck	Aythya marila					View
Lesser Scaup Duck	Aythya affinis					View
Bufflehead Duck	Bucephala albeola					View
Common Goldeneye Duck	Bucephala clangula					View
Hooded Merganser Duck	Lophodytes cucullatus					View
Common Merganser Duck	Mergus merganser					View
Ruddy Duck	Oxyura jamaicensis					View
Scaled Quail	Callipepla squamata					View
Gambel's Quail	Callipepla gambelii					View
Wild Turkey	Meleagris gallopavo merriami; intermedia; silvestris					View
Ring-necked Pheasant	Phasianus colchicus					View
Pied-billed Grebe	Podilymbus podiceps					View
Eared Grebe	Podiceps nigricollis				Y	View
Western Grebe	Aechmophorus occidentalis					View
Clark's Grebe	Aechmophorus clarkii				Y	View
Rock Pigeon	Columba livia					View
Band-tailed Pigeon	Patagioenas fasciata					View
Eurasian Collared-Dove	Streptopelia decaocto					View
Inca Dove	Columbina inca					View
White-winged Dove	Zenaida asiatica					View
Mourning Dove	Zenaida macroura					View
Greater Roadrunner	Geococcyx californianus					View
Yellow-billed Cuckoo (western pop)	Coccyzus americanus occidentalis		T	Y	Y	View
Common Nighthawk	Chordeiles minor				Y	View
Common Poorwill	Phalaenoptilus nuttalli					No Photo
Eastern Whip-poor-will	Antrostomus vociferus					No Photo
Mexican Whip-poor-will	Antrostomus arizonae				Y	View
Black Swift	Cypseloides niger				Y	View
Chimney Swift	Chaetura pelagica					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
White-throated Swift	Aeronautes saxatalis					View
Rivoli's Hummingbird	Eugenes fulgens					View
Black-chinned Hummingbird	Archilochus alexandri					View
Anna's Hummingbird	Calypte anna					View
Calliope Hummingbird	Selasphorus calliope					View
Rufous Hummingbird	Selasphorus rufus					View
Broad-tailed Hummingbird	Selasphorus platycercus					View
Broad-billed Hummingbird	Cynanthus latirostris	T			Y	View
White-eared Hummingbird	Basilinna leucotis	T				View
Virginia Rail	Rallus limicola					View
Sora	Porzana carolina					View
American Coot	Fulica americana					View
Sandhill Crane	Antigone canadensis					View
Black-necked Stilt	Himantopus mexicanus					View
American Avocet	Recurvirostra americana					View
American Golden Plover	Pluvialis dominica					No Photo
Killdeer	Charadrius vociferus					View
Mountain Plover	Charadrius montanus				Y	View
Snowy Plover	Charadrius nivosus				Y	View
Long-billed Curlew	Numenius americanus				Y	View
Baird's Sandpiper	Calidris bairdii					View
Least Sandpiper	Calidris minutilla					View
Western Sandpiper	Calidris mauri					View
American Woodcock	Scolopax minor					No Photo
Wilson's Snipe	Gallinago delicata					View
Spotted Sandpiper	Actitis macularius					View
Solitary Sandpiper	Tringa solitaria					View
Lesser Yellowlegs	Tringa flavipes					View
Willet	Tringa semipalmata					View
Greater Yellowlegs	Tringa melanoleuca					View
Wilson's Phalarope	Phalaropus tricolor					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Mew Gull	Larus canus					No Photo
Ring-billed Gull	Larus delawarensis					View
Herring Gull	Larus argentatus					View
Lesser Black-backed Gull	Larus fuscus					View
Least Tern	Sternula antillarum	E			Y	View
Black Tern	Chlidonias niger					View
Forster's Tern	Sterna forsteri					View
Red-throated Loon	Gavia stellata					No Photo
Common Loon	Gavia immer					No Photo
Double-crested Cormorant	Phalacrocorax auritus					View
Neotropic Cormorant	Phalacrocorax brasilianus	T			Y	View
Brown Pelican	Pelecanus occidentalis	E				View
American Bittern	Botaurus lentiginosus				Y	View
Least Bittern	Ixobrychus exilis exilis					View
Great Blue Heron	Ardea herodias					View
Snowy Egret	Egretta thula					View
Green Heron	Butorides virescens					View
Black-crowned Night-Heron	Nycticorax nycticorax					View
White-faced Ibis	Plegadis chihi					View
Turkey Vulture	Cathartes aura					View
Osprey	Pandion haliaetus					View
Golden Eagle	Aquila chrysaetos					View
Northern Harrier	Circus hudsonius					View
Sharp-shinned Hawk	Accipiter striatus					View
Cooper's Hawk	Accipiter cooperii					View
Northern Goshawk	Accipiter gentilis					View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Mississippi Kite	Ictinia mississippiensis					View
Common Black Hawk	Buteogallus anthracinus	T			Y	View
Harris's Hawk	Parabuteo unicinctus					View
Red-shouldered Hawk	Buteo lineatus					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Broad-winged Hawk	Buteo platypterus					View
Swainson's Hawk	Buteo swainsoni					View
Zone-tailed Hawk	Buteo albonotatus					View
Red-tailed Hawk	Buteo jamaicensis					View
Rough-legged Hawk	Buteo lagopus					View
Ferruginous Hawk	Buteo regalis					View
Barn Owl	Tyto alba					View
Flammulated Owl	Psiloscops flammeolus				Y	View
Western Screech-Owl	Megascops kennicottii					View
Great Horned Owl	Bubo virginianus					View
Northern Pygmy Owl	Glaucidium gnoma					View
Burrowing Owl	Athene cunicularia				Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Long-eared Owl	Asio otus					View
Short-eared Owl	Asio flammeus					View
Northern Saw-whet Owl	Aegolius acadicus					View
Belted Kingfisher	Megaceryle alcyon					View
Lewis's Woodpecker	Melanerpes lewis				Y	View
Red-headed Woodpecker	Melanerpes erythrocephalus				Y	View
Acorn Woodpecker	Melanerpes formicivorus					View
Williamson's Sapsucker	Sphyrapicus thyroideus				Y	View
Yellow-bellied Sapsucker	Sphyrapicus varius					View
Red-naped Sapsucker	Sphyrapicus nuchalis					View
American Three-toed Woodpecker	Picoides dorsalis					No Photo
Downy Woodpecker	Dryobates pubescens					View
Ladder-backed Woodpecker	Dryobates scalaris					View
Hairy Woodpecker	Dryobates villosus					View
Northern Flicker	Colaptes auratus					View
American Kestrel	Falco sparverius					View
Merlin	Falco columbarius					View
Aplomado Falcon	Falco femoralis	E	E		Y	View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Peregrine Falcon	Falco peregrinus	T			Y	View
Arctic Peregrine Falcon	Falco peregrinus tundrius					No Photo
Prairie Falcon	Falco mexicanus					View
Ash-throated Flycatcher	Myiarchus cinerascens					View
Brown-crested Flycatcher	Myiarchus tyrannulus					View
Cassin's Kingbird	Tyrannus vociferans					View
Western Kingbird	Tyrannus verticalis					View
Eastern Kingbird	Tyrannus tyrannus					View
Scissor-tailed Flycatcher	Tyrannus forficatus					View
Olive-sided Flycatcher	Contopus cooperi				Y	View
Western Wood Pewee	Contopus sordidulus					View
Willow Flycatcher	Empidonax traillii brewsteri; adastus					View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Least Flycatcher	Empidonax minimus					View
Hammond's Flycatcher	Empidonax hammondii					View
Gray Flycatcher	Empidonax wrightii					View
Dusky Flycatcher	Empidonax oberholseri					View
Cordilleran Flycatcher	Empidonax occidentalis					View
Buff-breasted Flycatcher	Empidonax fulvifrons					View
Black Phoebe	Sayornis nigricans					View
Eastern Phoebe	Sayornis phoebe					View
Say's Phoebe	Sayornis saya					View
Loggerhead Shrike	Lanius ludovicianus				Y	View
Northern Shrike	Lanius borealis					No Photo
Bell's Vireo	Vireo bellii	T			Y	View
Gray Vireo	Vireo vicinior	T			Y	View
Cassin's Vireo	Vireo cassinii					View
Blue-headed Vireo	Vireo solitarius					View
Plumbeous Vireo	Vireo plumbeus					View
Warbling Vireo	Vireo gilvus					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Red-eyed Vireo	Vireo olivaceus					View
Pinyon Jay	Gymnorhinus cyanocephalus				Y	View
Steller's Jay	Cyanocitta stelleri					View
Blue Jay	Cyanocitta cristata					View
Woodhouse's Scrub Jay	Aphelocoma woodhouseii					View
Mexican Jay	Aphelocoma woolweberi					View
Clark's Nutcracker	Nucifraga columbiana				Y	View
Black-billed Magpie	Pica hudsonia					View
American Crow	Corvus brachyrhynchos					View
Chihuahuan Raven	Corvus cryptoleucus					View
Common Raven	Corvus corax					View
Horned Lark	Eremophila alpestris					View
Bank Swallow	Riparia riparia				Y	View
Tree Swallow	Tachycineta bicolor					View
Violet-green Swallow	Tachycineta thalassina					View
Northern Rough-winged Swallow	Stelgidopteryx serripennis					View
Barn Swallow	Hirundo rustica					View
Cliff Swallow	Petrochelidon pyrrhonota					View
Black-capped Chickadee	Poecile atricapillus					View
Mountain Chickadee	Poecile gambeli					View
Juniper Titmouse	Baeolophus ridgwayi				Y	View
Verdin	Auriparus flaviceps					View
Bushtit	Psaltriparus minimus					View
Red-breasted Nuthatch	Sitta canadensis					View
White-breasted Nuthatch	Sitta carolinensis					View
Pygmy Nuthatch	Sitta pygmaea				Y	View
Brown Creeper	Certhia americana					View
Rock Wren	Salpinctes obsoletus					View
Canyon Wren	Catherpes mexicanus					View
House Wren	Troglodytes aedon					View
Winter Wren	Troglodytes hiemalis					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Marsh Wren	Cistothorus palustris					View
Bewick's Wren	Thryomanes bewickii					View
Blue-gray Gnatcatcher	Polioptila caerulea					View
Black-tailed Gnatcatcher	Polioptila melanura					View
American Dipper	Cinclus mexicanus					View
Golden-crowned Kinglet	Regulus satrapa					No Photo
Ruby-crowned Kinglet	Regulus calendula					View
Eastern Bluebird	Sialia sialis					View
Western Bluebird	Sialia mexicana				Y	View
Mountain Bluebird	Sialia currucoides				Y	View
Townsend's Solitaire	Myadestes townsendi					View
Swainson's Thrush	Catharus ustulatus					View
Hermit Thrush	Catharus guttatus					View
American Robin	Turdus migratorius					View
Gray Catbird	Dumetella carolinensis					View
Curve-billed Thrasher	Toxostoma curvirostre					View
Brown Thrasher	Toxostoma rufum					View
Bendire's Thrasher	Toxostoma bendirei				Y	View
Crissal Thrasher	Toxostoma crissale					View
Sage Thrasher	Oreoscoptes montanus					View
Northern Mockingbird	Mimus polyglottos					View
European Starling	Sturnus vulgaris					View
Bohemian Waxwing	Bombycilla garrulus					No Photo
Cedar Waxwing	Bombycilla cedrorum					View
Phainopepla	Phainopepla nitens					View
House Sparrow	Passer domesticus					View
American Pipit	Anthus rubescens					View
Sprague's Pipit	Anthus spragueii				Y	View
Evening Grosbeak	Coccothraustes vespertinus				Y	View
Pine Grosbeak	Pinicola enucleator					No Photo
Gray-crowned Rosy-Finch	Leucosticte tephrocotis					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Black Rosy-Finch	Leucosticte atrata					View
Brown-capped Rosy-Finch	Leucosticte australis				Y	View
House Finch	Haemorhous mexicanus					View
Cassin's Finch	Haemorhous cassinii				Y	View
Red Crossbill	Loxia curvirostra					View
White-winged Crossbill	Loxia leucoptera					No Photo
Pine Siskin	Spinus pinus					View
Lesser Goldfinch	Spinus psaltria					View
American Goldfinch	Spinus tristis					View
Cassin's Sparrow	Peucaea cassinii				Y	View
Grasshopper Sparrow	Ammodramus savannarum perpallidus					View
Black-throated Sparrow	Amphispiza bilineata					View
Lark Sparrow	Chondestes grammacus					View
Lark Bunting	Calamospiza melanocorys					View
Chipping Sparrow	Spizella passerina					View
Clay-colored Sparrow	Spizella pallida					View
Black-chinned Sparrow	Spizella atrogularis				Y	View
Field Sparrow	Spizella pusilla					View
Brewer's Sparrow	Spizella breweri					View
Fox Sparrow	Passerella iliaca					View
American Tree Sparrow	Spizelloides arborea					No Photo
Dark-eyed Junco	Junco hyemalis					View
White-crowned Sparrow	Zonotrichia leucophrys					View
Golden-crowned Sparrow	Zonotrichia atricapilla					View
Harris's Sparrow	Zonotrichia querula					View
White-throated Sparrow	Zonotrichia albicollis					View
Sagebrush Sparrow	Artemisiospiza nevadensis				Y	View
Vesper Sparrow	Pooecetes gramineus				Y	View
Baird's Sparrow	Centronyx bairdii	T			Y	View
Savannah Sparrow	Passerculus sandwichensis nevadensis; anthinus					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Song Sparrow	Melospiza melodia					View
Lincoln's Sparrow	Melospiza lincolnii					View
Swamp Sparrow	Melospiza georgiana					View
Canyon Towhee	Melozone fusca					View
Rufous-crowned Sparrow	Aimophila ruficeps					View
Green-tailed Towhee	Pipilo chlorurus					View
Spotted Towhee	Pipilo maculatus					View
Yellow-breasted Chat	Icteria virens					View
Yellow-headed Blackbird	Xanthocephalus xanthocephalus					View
Bobolink	Dolichonyx oryzivorus					No Photo
Eastern Meadowlark	Sturnella magna					View
Western Meadowlark	Sturnella neglecta					View
Orchard Oriole	Icterus spurius					View
Hooded Oriole	Icterus cucullatus					View
Bullock's Oriole	Icterus bullockii					View
Baltimore Oriole	Icterus galbula					View
Scott's Oriole	Icterus parisorum					View
Red-winged Blackbird	Agelaius phoeniceus					View
Brown-headed Cowbird	Molothrus ater					View
Rusty Blackbird	Euphagus carolinus					View
Brewer's Blackbird	Euphagus cyanocephalus					View
Common Grackle	Quiscalus quiscula					View
Great-tailed Grackle	Quiscalus mexicanus					View
Ovenbird	Seiurus aurocapilla					No Photo
Worm-eating Warbler	Helmitheros vermivorum					No Photo
Northern Waterthrush	Parkesia noveboracensis					View
Black-and-white Warbler	Mniotilta varia					View
Prothonotary Warbler	Protonotaria citrea					No Photo
Tennessee Warbler	Leiothlypis peregrina					No Photo
Orange-crowned Warbler	Leiothlypis celata					View
Lucy's Warbler	Leiothlypis luciae				Y	View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Nashville Warbler	Leiothlypis ruficapilla					View
Virginia's Warbler	Leiothlypis virginiae				Y	View
Macgillivray's Warbler	Geothlypis tolmiei					View
Mourning Warbler	Geothlypis philadelphia					No Photo
Common Yellowthroat	Geothlypis trichas					View
Hooded Warbler	Setophaga citrina					View
American Redstart	Setophaga ruticilla					View
Northern Parula	Setophaga americana					No Photo
Yellow Warbler	Setophaga petechia					View
Chestnut-sided Warbler	Setophaga pensylvanica					No Photo
Blackpoll Warbler	Setophaga striata					No Photo
Black-throated Blue Warbler	Setophaga caerulescens					View
Palm Warbler	Setophaga palmarum					View
Pine Warbler	Setophaga pinus					View
Yellow-rumped Warbler	Setophaga coronata					View
Prairie Warbler	Setophaga discolor					View
Grace's Warbler	Setophaga graciae				Y	View
Black-throated Gray Warbler	Setophaga nigrescens				Y	View
Townsend's Warbler	Setophaga townsendi					View
Black-throated Green Warbler	Setophaga virens					View
Wilson's Warbler	Cardellina pusilla					View
Red-faced Warbler	Cardellina rubrifrons				Y	View
Painted Redstart	Myioborus pictus				Y	View
Hepatic Tanager	Piranga flava					View
Summer Tanager	Piranga rubra					View
Western Tanager	Piranga ludoviciana					View
Northern Cardinal	Cardinalis cardinalis					View
Pyrrhuloxia	Cardinalis sinuatus					View
Rose-breasted Grosbeak	Pheucticus ludovicianus					View
Black-headed Grosbeak	Pheucticus melanocephalus					View
Blue Grosbeak	Passerina caerulea					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Lazuli Bunting	Passerina amoena					View
Indigo Bunting	Passerina cyanea					View
Painted Bunting	Passerina ciris					View
Dickcissel	Spiza americana					View
Snapping Turtle	Chelydra serpentina					View
Western Painted Turtle	Chrysemys picta					View
Ornate Box Turtle	Terrapene ornata					View
Big Bend Slider	Trachemys gaigeae				Y	View
Red-eared Slider	Trachemys scripta					View
Yellow Mud Turtle	Kinosternon flavescens					View
Sonoran Mud Turtle	Kinosternon sonoriense sonoriense				Y	View
Spiny Softshell Turtle	Apalone spinifera					View
Eastern Collared Lizard	Crotaphytus collaris					View
Long-nosed Leopard Lizard	Gambelia wislizenii					View
Common Lesser Earless Lizard	Holbrookia maculata maculata; bunkeri; ruthveni					View
Texas Horned Lizard	Phrynosoma cornutum					View
Hernandez's Short-horned Lizard	Phrynosoma hernandesi					View
Round-tailed Horned Lizard	Phrynosoma modestum					View
Southwestern Fence Lizard	Sceloporus cowlesi					View
Northern Tree Lizard	Urosaurus ornatus					View
Common Side-blotched Lizard	Uta stansburiana					View
Mediterranean Gecko	Hemidactylus turcicus					View
Chihuahuan Spotted Whiptail	Aspidoscelis exsanguis					View
Woodland Striped Whiptail	Aspidoscelis inornata junipera					No Photo
Plains Striped Whiptail	Aspidoscelis inornata llanuras					View
Marbled Whiptail	Aspidoscelis marmorata					View
New Mexico Whiptail	Aspidoscelis neomexicana					View
Common Checkered Whiptail	Aspidoscelis tesselata					View
Desert Grassland Whiptail	Aspidoscelis uniparens					View
Plateau Striped Whiptail	Aspidoscelis velox					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Many-lined Skink	Plestiodon multivirgatus					View
Great Plains Skink	Plestiodon obsoletus					View
Texas Blind Snake	Rena dissecta					View
Glossy Snake	Arizona elegans					View
North American Racer	Coluber constrictor					View
Coachwhip	Coluber flagellum					View
Desert Striped Whipsnake	Coluber taeniatus					View
Ringneck Snake	Diadophis punctatus					View
Western Hooknose Snake	Gyalopion canum					View
Plains Hog-nosed Snake	Heterodon nasicus					View
Chihuahuan Nightsnake	Hypsiglena jani					View
Milk Snake	Lampropeltis gentilis					View
Desert Kingsnake	Lampropeltis splendida					View
Smooth Greensnake	Opheodrys vernalis					View
Great Plains Rat Snake	Pantherophis emoryi					View
Gophersnake	Pituophis catenifer					View
Texas Long-nosed Snake	Rhinocheilus lecontei					View
Mountain Patchnose Snake	Salvadora grahamiae					View
Plains Black-headed Snake	Tantilla nigriceps					View
Black-necked Gartersnake	Thamnophis cyrtopsis					View
Wandering Gartersnake	Thamnophis elegans					View
Marcy's Checkered Gartersnake	Thamnophis marcianus					View
New Mexico Gartersnake	Thamnophis sirtalis					View
Lined Snake	Tropidoclonion lineatum					View
Western Diamond-backed Rattlesnake	Crotalus atrox					View
Eastern Black-tailed Rattlesnake	Crotalus ornatus					View
Prairie Rattlesnake	Crotalus viridis					View
Western Massasauga	Sistrurus tergeminus				Y	View
Tiger Salamander	Ambystoma mavortium mavortium; nebulosum					View
Plains Spadefoot	Spea bombifrons					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
New Mexico Spadefoot	Spea multiplicata					View
Great Plains Toad	Anaxyrus cognatus					View
Red-spotted Toad	Anaxyrus punctatus					View
Woodhouse's Toad	Anaxyrus woodhousii					View
Canyon Treefrog	Hyla arenicolor					View
Boreal Chorus Frog	Pseudacris maculata				Y	View
Bullfrog	Lithobates catesbeianus					View
Northern Leopard Frog	Lithobates pipiens				Y	View
Couch's Spadefoot	Scaphiopus couchii					View
Gizzard Shad	Dorosoma cepedianum					View
Central Stoneroller	Campostoma anomalum					View
Grass Carp	Ctenopharyngodon idella					No Photo
Red Shiner	Cyprinella lutrensis					View
Common Carp	Cyprinus carpio					View
Rio Grande Chub	Gila pandora				Y	View
Rio Grande Silvery Minnow	Hybognathus amarus	E	E	Y	Y	View
Fathead Minnow	Pimephales promelas					View
Flathead Chub	Platygobio gracilis					View
Longnose Dace	Rhinichthys cataractae					View
River Carpsucker	Carpiodes carpio					View
White Sucker	Catostomus commersoni					View
Black Bullhead	Ameiurus melas					View
Yellow Bullhead	Ameiurus natalis					View
Channel Catfish	Ictalurus punctatus					View
Rainbow Trout	Oncorhynchus mykiss					View
Brown Trout	Salmo trutta					View
Western mosquitofish	Gambusia affinis					No Photo
Green Sunfish	Lepomis cyanellus					View
Bluegill	Lepomis macrochirus					View
Largemouth Bass	Micropterus salmoides					View
White Crappie	Pomoxis annularis					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Yellow Perch	Perca flavescens					View
Walleye	Sander vitreus					View
Decollate Snail	Rumina decollata					View
Forest Disc Snail	Discus whitneyi					No Photo
Mexican Coil Snail	Helicodiscus eigenmani					No Photo
Socorro Mountainsnail	Oreohelix neomexicana					No Photo
Rocky Mountainsnail	Oreohelix strigosa					View
Crested Snaggletooth Snail	Gastrocopta cristata					No Photo
Montane Snaggletooth Snail	Gastrocopta pilsbryana					No Photo
Cross Snaggletooth Snail	Gastrocopta quadridens					No Photo
Rocky Mtn. Column Snail	Pupilla blandi					No Photo
Vertigo Snail	Vertigo arizonensis					No Photo
Vertigo Snail	Vertigo concinnula					No Photo
Glossy Pillar Snail	Cionella lubrica					No Photo
Silky Vallonia Snail	Vallonia cyclophorella					No Photo
Multirib Vallonia Snail	Vallonia gracilicosta					No Photo
Thin-lipped Vallonia Snail	Vallonia perspectiva					No Photo
Lovely Vallonia Snail	Vallonia pulchella					No Photo
Threeband Gardenslug Snail	Lehmannia valentiana					No Photo
Western Glass Snail	Vitrina pellucida					No Photo
Minute Gem Snail	Hawaiia minuscula					No Photo
Amber Glass Snail	Nesovitrea hammonis					No Photo
Median Striate Snail	Striatura meridionalis					No Photo
Quick Gloss Snail	Zonitoides arboreus					No Photo
Brown Hive Snail	Euconulus fulvus					No Photo
Brown Gardensnail	Helix aspersa					View
Spruce Snail	Microphysula ingersolli					No Photo
Tiger Beetle	Cicindela fulgida fulgida; pseudowillistoni					No Photo
Tiger Beetle	Cicindela hemorrhagica					No Photo
Tiger Beetle	Cicindela hirticollis					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Tiger Beetle	Cicindela lemniscata					No Photo
Dainty Tiger Beetle	Cicindela lepida					No Photo
Tiger Beetle	Cicindela longilabris laurentii					No Photo
Tiger Beetle	Cicindela marutha					No Photo
Tiger Beetle	Cicindela nigrocoerula					No Photo
Tiger Beetle	Cicindela oregona					No Photo
Tiger Beetle	Cicindela punctulata					No Photo
Tiger Beetle	Cicindela purpurea					No Photo
Tiger Beetle	Cicindela repanda					View
Tiger Beetle	Cicindela sedecimpunctata					No Photo
Tiger Beetle	Cicindela sperata					No Photo
Variable Tiger Beetle	Cicindela terricola					No Photo
Tiger Beetle	Habroscelimorpha fulgoris fulgoris					No Photo
Beetle	Ostoma pippingskoeldi					No Photo
Long-horned Beetle	Tylosis maculatus					View
Common Red Fire Ant	Solenopsis invicta					No Photo
Pyralid Moth	Loxostege quaestoralis					No Photo
Moth	Automeris zephyria					View
Moth	Hemileuca artemis					No Photo
Magnificent Sheepmoth	Hemileuca hera magnifica					No Photo
Polyphemus Moth	Antheraea polyphemus					View
Pink Spotted Hawk Moth	Agrius cingulata					No Photo
Elm Sphinx Moth	Ceratomia amyntor					No Photo
Silkmoth	Automeris io neomexicana					No Photo
Five Spotted Hawk Moth	Manduca quinquemaculata					View
Blinded Sphinx Moth	Paonias excaecatus					View
Small-eyed Sphinx Moth	Paonias myops					No Photo
Moth	Sagenosoma elsa					No Photo
Great Ash Moth	Sphinx chersis					View
Vashti Sphinx Moth	Sphinx vashti					View
Achemon Sphinx Moth	Eumorpha achemon					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Snowberry Clearwing Moth	Hemaris diffinis					No Photo
White-lined Sphinx Moth	Hyles lineata					View
Moth	Euproserpina wiesti					No Photo
Silver-Spotted Skipper	Epargyreus clarus clarus					View
Afranius Duskywing Skipper	Erynnis afranius					No Photo
Sleepy Duskywing Skipper	Erynnis brizo					View
Funereal Duskywing Skipper	Erynnis funeralis					View
Dreamy Duskywing Skipper	Erynnis icelus					View
Meridian Duskywing Skipper	Erynnis meridianus					No Photo
Pacuvius Duskywing Skipper	Erynnis pacuvius					No Photo
Persius Duskywing Skipper	Erynnis persius					No Photo
Rocky Mtn Duskywing Skipper	Erynnis telemachus					View
Saltbush Sootywing Skipper	Hesperopsis alpheus					No Photo
Common Sootywing Skipper	Pholisora catullus					View
Mexican Sootywing Skipper	Pholisora mejicana					No Photo
Common Checkered Skipper	Pyrgus communis					View
Small Checkered Skipper	Pyrgus scriptura					View
Golden-headed Scallopwing Skipper	Staphylus ceos					No Photo
Mexican Cloudwing Skipper	Thorybes mexicanus					No Photo
Northern Cloudywing Skipper	Thorybes pylades					View
Short-Tailed Skipper	Zestusa dorus					No Photo
Russet Skipperling Skipper	Piruna pirus					View
Bronze Roadside Skipper	Amblyscirtes aenus					No Photo
Dotted Roadside Skipper	Amblyscirtes eos					No Photo
Oslar's Roadside Skipper	Amblyscirtes oslari					No Photo
Orange-headed Roadside Skipper	Amblyscirtes phylace					No Photo
Simius Roadside Skipper	Amblyscirtes simius					No Photo
Sachem Skipper	Atalopedes campestris					View
Python Skipper	Atrytonopsis python					No Photo
Viereck's Skipper	Atrytonopsis vierecki					No Photo
Orange Skipperling Skipper	Copaeodes aurantiacus					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Kiowa Dun Skipper	Euphyes vestris					View
Pahaska Skipper	Hesperia pahaska pahaska					No Photo
Uncas Skipper	Hesperia uncas uncas					No Photo
Green Skipper	Hesperia viridis					View
Fiery Skipper	Hylephila phlyeus					View
Edwards' Skipperling Skipper	Oarisma edwardsii					No Photo
Garita Skipperling Skipper	Oarisma garita					View
Taxiles Skipper	Poanes taxiles					View
Colorado Giant Skipper	Megathymus coloradensis coloradensis					No Photo
Strecker's Giant Skipper	Megathymus streckeri streckeri					View
Pipevine Swallowtail Butterfly	Battus philenor					View
Carus Skipper	Yvretta carus					No Photo
Black Swallowtail Butterfly	Papilio polyxenes asterius					View
Anise Swallowtail Butterfly	Papilio zelicaon zelicaon					View
Western Tiger Swallowtail Butterfly	Pterourus rutulus rutulus					View
Ingham's Orangetip Butterfly	Anthocharis sara					View
Two-Tailed Swallowtail Butterfly	Pterourus multicaudatus					View
Colorado Marble Butterfly	Euchloe ausonides					No Photo
Pine White Butterfly	Neophasia menapia					View
McDunnough's White Butterfly	Pieris napi mcdunnoughi					No Photo
Cabbage White Butterfly	Pieris rapae					View
Checkered White Butterfly	Pontia protodice					View
Spring White Butterfly	Pontia sisymbrii elivata					No Photo
Orange Sulphur Butterfly	Colias eurytheme					View
Western Common Sulphur Butterfly	Colias philodice					View
Mexican Yellow Butterfly	Eurema mexicanum					No Photo
Sleepy Orange Butterfly	Eurema nicippe					View
Dainty Sulphur Butterfly	Nathalis iole					View
Cloudless Sulphur Butterfly	Phoebis sennae					View
Southern Dogface Butterfly	Zerene cesonia					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Colorado Hairstreak Butterfly	Hypaurotis crysalus					View
Great Purple Hairstreak Butterfly	Atlides halesus					View
Juniper Hairstreak Butterfly	Callophrys gryneus					View
Thicket Hairstreak Butterfly	Callophrys spinetorum					View
Sandia Hairstreak Butterfly	Callophrys mcfarlandi					View
Cross's Hairstreak Butterfly	Satyrium behrii					No Photo
Godart's Hairstreak Butterfly	Satyrium calanus					No Photo
Immaculate Hairstreak Butterfly	Satyrium titus immaculosus					No Photo
Frank's Common Hairstreak Butterfly	Strymon melinus					View
Rustic Blue Butterfly	Agriades rusticus					View
Arizona Blue Butterfly	Celastrina ladon cinerea					No Photo
Square-spotted Blue Butterfly	Euphilotes battoides centralis					View
Rita Blue Butterfly	Euphilotes rita rita					View
Western Tailed Blue Butterfly	Cupido amyntula					View
Silvery Blue Butterfly	Glaucopsyche lygdamus oro					View
Reakirt's Blue Butterfly	Hemiargus isola					View
Marine Blue Butterfly	Leptotes marina					View
Melissa Blue Butterfly	Plebejus melissa					View
Texas Blue Butterfly	Plebejus acmon					View
Mexican Metalmark Butterfly	Apodemia mormo mejicana					No Photo
Shellbach's Copper Butterfly	Tharsalea arota					View
Leda Hairstreak Butterfly	Ministrymon leda					No Photo
Palmer's Metalmark Butterfly	Apodemia palmerii					No Photo
Western Pygmy Blue Butterfly	Brephidum exile					View
Southern Snout Butterfly	Libytheana bachmanii					No Photo
Milbert's Tortoise Shell Butterfly	Aglais milberti					View
Buckeye Butterfly	Junonia coenia					View
Mourning Cloak Butterfly	Nymphalis antiopa					View
Green Comma Butterfly	Polygonia faunus					View
Hoary Comma Butterfly	Polygonia gracilis					View
Question Mark Butterfly	Polygonia interrogationis					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Satyr Anglewing Butterfly	Polygonia satyrus					No Photo
West Coast Lady Butterfly	Vanessa annabella					View
Red Admiral Butterfly	Vanessa atalanta					View
Painted Lady Butterfly	Vanessa cardui					View
American Lady Butterfly	Vanessa virginiensis					View
Variegated Fritillary Butterfly	Euptoieta claudia					View
Dorothy's Fritillary Butterfly	Speyeria hesperis dorothea					No Photo
Crocale Patch Butterfly	Chlosyne lacinia					View
Mylitta Crescent Butterfly	Phyciodes mylitta					View
Painted Crescent Butterfly	Phyciodes pictus					View
Camillus Crescent Butterfly	Phyciodes pulchella					View
Pearl Crescent Butterfly	Phyciodes tharos Type A					View
Fulvia Checkerspot Butterfly	Thessalia fulvia					View
Arizona Sister Butterfly	Adelpha bredowii					View
Goatweed Butterfly	Anaea andria					No Photo
Hackberry Emperor Butterfly	Asterocampa celtis antonia					View
Chermock's Satyr Butterfly	Cercyonis meadii mexicana					No Photo
Charon Satyr Butterfly	Cercyonis oetus					View
Common Wood-Nymph Butterfly	Cercyonis pegala					View
Ochre Ringlet Butterfly	Coenonympha ochracea ochracea					View
Canyonland Satyr Butterfly	Cyllopsis pertepida dorothea					View
Striated Queen Butterfly	Danaus gilippus					View
Monarch Butterfly	Danaus plexippus		C			View
Gulf Fritillary Butterfly	Agraulis vanillae					View
Drusius Checkerspot Butterfly	Charidryas nycteis					View
Pearly Checkerspot Butterfly	Charidryas acastus acastus					No Photo
Texan Crescent Butterfly	Anthanassa texana					View
Viceroy Butterfly	Limenitis archippus archippus					No Photo
Obsolete Viceroy Butterfly	Limenitis archippus obsoleta					No Photo
Weidemeyer's Admiral Butterfly	Limenitis weidemeyerii weidemeyerii					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Arizona Viceroy	Limenitis archippus obsoleta					No Photo
Great Spreadwing	Archilestes grandis					View
Plateau Spreadwing	Lestes alacer					View
Spotted Spreadwing	Lestes congener					View
American Rubyspot	Hetaerina americana					View
Blue-fronted Dancer	Argia apicalis					View
Powdered Dancer	Argia moesta					View
Aztec Dancer	Argia nahuana					View
Amethyst Dancer	Argia pallens					View
Springwater Dancer	Argia plana					View
Blue-ringed Dancer	Argia sedula					View
Double-striped Bluet	Enallagma basidens					No Photo
Tule Bluet	Enallagma carunculatum					View
Familiar Bluet	Enallagma civile					View
Arroyo Bluet	Enallagma praevarum					No Photo
Desert Forktail	Ischnura barberi					No Photo
Plains Forktail	Ischnura damula					View
Mexican Forktail	Ischnura demorsa					View
Black-fronted Forktail	Ischnura denticollis					No Photo
Shadow Darner	Aeshna umbrosa					No Photo
Common Green Darner	Anax junius					View
Riffle Darner	Oplonaeschna armata					No Photo
Blue-eyed Darner	Rhionaeschna multicolor					View
White-belted Ringtail	Erpetogomphus compositus					View
Plains Clubtail	Gomphurus externus					View
Gray Sanddragon	Progomphus borealis					View
Brimstone Clubtail	Stylurus intricatus					View
Russet-tipped Clubtail	Stylurus plagiatus					No Photo
Dot-winged Baskettail	Epitheca petechialis					No Photo
Western Pondhawk	Erythemis collocata					No Photo
Bleached Skimmer	Libellula composita					View

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Eight-spotted Skimmer	Libellula forensis					View
Widow skimmer	Libellula luctuosa					View
Twelve-spotted Skimmer	Libellula pulchella					View
Four-spotted Skimmer	Libellula quadrimaculata					View
Flame Skimmer	Libellula saturata					View
Roseate Skimmer	Orthemis ferruginea					View
Blue Dasher	Pachydiplax longipennis					View
Wandering Glider	Pantala flavescens					View
Spot-winged Glider	Pantala hymenaea					View
Eastern Amberwing	Perithemis tenera					View
Common Whitetail	Plathemis lydia					View
Desert Whitetail	Plathemis subornata					View
Filigree Skimmer	Pseudoleon superbus					No Photo
Variegated meadowhawk	Sympetrum corruptum					View
Striped Meadowhawk	Sympetrum pallipes					View
Band-winged Meadowhawk	Sympetrum semicinctum					View
Black Saddlebags	Tramea lacerata					View
Red Saddlebags	Tramea onusta					View
Lubber Grasshopper	Brachystola magna					View
Slender Range Grasshopper	Acantherus piperatus					No Photo
Club-Horned Grasshopper	Aeropedellus clavatus					No Photo
White Whiskers Grasshopper	Ageneotettix deorum					No Photo
Striped Slant-Faced Grasshopper	Amphitornus coloradus					No Photo
Elliott Grasshopper	Aulocara elliotti					No Photo
White Cross Grasshopper	Aulocara femoratum					No Photo
Marsh Meadow Grasshopper	Chorthippus curtipennis					No Photo
Crenulated Grasshopper	Cordillacris crenulata					No Photo
Spotted Wing Grasshopper	Cordillacris occipitalis					No Photo
Velvet-Striped Grasshopper	Eritettix simplex					No Photo
Rufous Grasshopper	Heliaula rufa					No Photo
Mermiria Grasshopper	Mermiria bivittata					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Grasshopper	Mermiria texana					No Photo
Green Desert Grasshopper	Orphulella pelidna					No Photo
Obscure Grasshopper	Opeia obscura					No Photo
Grasshopper	Paropomala virgata					No Photo
Wyoming Toothpick Grasshopper	Paropomala wyomingensis					No Photo
Brown Spotted Range Grasshopper	Psoloessa delicatula					No Photo
Grasshopper	Psoloessa texana					No Photo
Slant-Faced Grasshopper	Syrbula montezuma					No Photo
Speckled Rangeland Grasshopper	Arphia conspera					No Photo
Red-Winged Grasshopper	Arphia pseudonietana					No Photo
Clear-Winged Grasshopper	Camnula pellucida					No Photo
Northern Green-Striped Locust Grasshopper	Chortophaga viridifasciata					No Photo
Wrangler Grasshopper	Circotettix rabula					View
Groove-Headed Grasshopper	Conozoa sulcifrons					No Photo
Grasshopper	Conozoa texana					No Photo
Pronotal Range Grasshopper	Cratypedes neglectus					No Photo
Grasshopper	Derotmema laticinctum					No Photo
Carolina Grasshopper	Dissosteira carolina					No Photo
Dusky Grasshopper	Encoptolophus costalis					No Photo
Grasshopper	Encoptolophus subgracilis					No Photo
Three-Banded Range Grasshopper	Hadrotettix trifasciatus					No Photo
Arroyo Grasshopper	Heliastus benjamini					No Photo
Grasshopper	Hippopedon capito					No Photo
Blue-Winged Grasshopper	Leprus intermedius					No Photo
Haldeman's Grasshopper	Pardalophora haldemani					No Photo
Grasshopper	Shotwellia isleta					No Photo
Boll's Grasshopper	Spharagemon bolli					No Photo
Campestral Grasshopper	Spharagemon campestris					No Photo
Mottled Sand Grasshopper	Spharagemon collare					No Photo
Finned Grasshopper	Trachyrhachys aspera					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Kiowa Range Grasshopper	Trachyrhachys kiowa					No Photo
Strenuous Grasshopper	Trimerotropis californica					No Photo
Grasshopper	Trimerotropis cincta					No Photo
Blue-Winged Grasshopper	Trimerotropis cyaneipennis					No Photo
Grasshopper	Trimerotropis fratercula					No Photo
Thomas' Slender Grasshopper	Trimerotropis gracilis					No Photo
Citrus Winged Grasshopper	Trimerotropis maritima					No Photo
Black-Winged Grasshopper	Trimerotropis melanoptera					No Photo
Grasshopper	Trimerotropis modesta					No Photo
Pallid-Winged Grasshopper	Trimerotropis pallidipennis					View
Barren Land Grasshopper	Trimerotropis pristrinaria					No Photo
Grasshopper	Trimerotropis salina					No Photo
Great Crested Grasshopper	Tropidolophus formosus					View
Red Shanks Grasshopper	Xanthippus corallipes					No Photo
Grasshopper	Xanthippus montanus					No Photo
White-Lined Bird Grasshopper	Schistocerca alutacea albolineata					No Photo
Lined Bird Grasshopper	Schistocerca alutacea lineata					No Photo
Green Bird Grasshopper	Schistocerca alutacea shoshone					No Photo
Gray Bird Locust Grasshopper	Schistocerca nitens					No Photo
Grasshopper	Aeoloplides rotundipennis					No Photo
Thistle Grasshopper	Aeoloplides turnbulli					No Photo
Fuzzy Olive-Green Grasshopper	Campylacantha olivacea					No Photo
Painted Grasshopper	Dactylotum bicolor					View
Green Streak Grasshopper	Hesperotettix viridis					No Photo
Narrow-Winged Spur-Throat Grasshopper	Melanoplus angustipennis					No Photo
Arid Land's Spur-Throat Grasshopper	Melanoplus aridis					No Photo
Arizona Spur-Throat Grasshopper	Melanoplus arizonae					No Photo
Two-Striped Grasshopper	Melanoplus bivittatus					No Photo
Grasshopper	Melanoplus bohemani					No Photo
Bowditch's Spur-Throat Grasshopper	Melanoplus bowditchi					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Ashy Spur-Throat Grasshopper	Melanoplus cinereus					No Photo
Little Pasture Spur-Throat Grasshopper	Melanoplus confusus					No Photo
Differential Grasshopper	Melanoplus differentialis					No Photo
Grasshopper	Melanoplus femurnigrum					No Photo
Red-Legged Grasshopper	Melanoplus femurrubrum					No Photo
Yellow Spur-Throat Grasshopper	Melanoplus flavidus					No Photo
Grasshopper	Melanoplus foedus					No Photo
Glaucous-Legged Grasshopper	Melanoplus glaucipes					No Photo
Arrowweed Spur-Throat Grasshopper	Melanoplus herbaceous					No Photo
Grasshopper	Melanoplus lakinus					No Photo
Flabellate Grasshopper	Melanoplus occidentalis					No Photo
Packard's Grasshopper	Melanoplus packardi					No Photo
Grasshopper	Melanoplus splendidus					No Photo
Large-Headed Grasshopper	Phoetaliotes nebrascensis					No Photo
Platte Range Grasshopper	Mestobregna plattei					No Photo
Grasshopper	Mestobregna terricolor					No Photo
Slate Millipede	Comanchelus chihuanus					View
Millipede	Orthoporus ornatus					View
Spider	Psilochorus pullulus					No Photo
Comb-Footed Spider	Dipoena nigra					No Photo
Comb-Footed Spider	Steatoda apacheana					No Photo
Comb-Footed Spider	Steatoda grandis					No Photo
Comb-Footed Spider	Steatoda variata					No Photo
Comb-Footed Spider	Theridion neomexicanum					No Photo
Spider	Montilaira perplexa					No Photo
Spider	Grammonota pictilis					No Photo
Spider	Microneta viaria					No Photo
Black and Yellow Argiope Spider	Argiope aurantia					No Photo
Spider	Argiope trifasciata					No Photo
Spider	Arctosa alpigena					No Photo
Spider	Hogna helluo					No Photo

All Species
Bernalillo

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Thin-legged Wolf Spider	Pardosa falcifera					No Photo
Thin-legged Wolf Spider	Pardosa glacialis					No Photo
Thin-legged Wolf Spider	Pardosa orophila					No Photo
Thin-legged Wolf Spider	Pardosa sierra					No Photo
Thin-legged Wolf Spider	Pardosa sternalis					No Photo
Thin-legged Wolf Spider	Pardosa steva					No Photo
Thin-legged Wolf Spider	Pardosa uncata					No Photo
Thin-legged Wolf Spider	Pardosa yavapa					No Photo
Spider	Schizocosa chiricahua					No Photo
Spider	Varacosa gosiuta					No Photo
Vinegaroon	Mastigoproctus giganteus					View
Pseudoscorpion	Chelifer cancroides					No Photo
Pseudoscorpion	Dactylochelifer silvestris					No Photo
Pseudoscorpion	Haplochelifer philipi					No Photo
Pseudoscorpion	Parachelifer persimilis					No Photo
Pseudoscorpion	Hysterochelifer urbanus					No Photo
Pseudoscorpion	Lamprochernes ellipticus					No Photo
Pseudoscorpion	Hesperochernes molestus					No Photo
Pseudoscorpion	Dinocheirus astutus					No Photo
Pseudoscorpion	Dinocheirus imperiosus					No Photo
Pseudoscorpion	Parachernes nubilis					No Photo
Pseudoscorpion	Tychochernes inflatus					No Photo
Pseudoscorpion	Apochthonius moestus					No Photo
Pseudoscorpion	Mundochthonius montanus					No Photo
Pseudoscorpion	Archeolarca rotunda					No Photo
Pseudoscorpion	Lechytia pacifica					No Photo
Pseudoscorpion	Microbisium parvulum					No Photo
Pseudoscorpion	Neoambylopium alienum					No Photo
Pseudoscorpion	Serianus dolosus					No Photo
Brown Recluse Spider	Loxosceles reclusa					View
Pseudoscorpion	Syarinus granulatus					No Photo

APPENDIX E: USFWS IPAC REPORT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bernalillo County, New Mexico

Local office

New Mexico Ecological Services Field Office

(505) 346-2525
(505) 346-2542

2105 Osuna Road Ne
Albuquerque, NM 87113-1001

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
New Mexico Meadow Jumping Mouse Zapus hudsonius luteus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7965	Endangered

Birds

NAME	STATUS
Mexican Spotted Owl Strix occidentalis lucida Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8196	Threatened
Southwestern Willow Flycatcher Empidonax traillii extimus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6749	Endangered

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Rio Grande Silvery Minnow Hybognathus amarus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/1391	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

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.

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

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 Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31
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.

Black Rosy-finch Leucosticte atrata — Breeds Jun 15 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9460

Black-chinned Sparrow Spizella atrogularis — Breeds Apr 15 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9447

Brown-capped Rosy-finch Leucosticte australis — Breeds Jun 15 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cassin's Finch Carpodacus cassinii — Breeds May 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9462

Clark's Nutcracker Nucifraga columbiana — Breeds Jan 15 to Jul 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Grace's Warbler Dendroica graciae — Breeds May 20 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Pinyon Jay Gymnorhinus cyanocephalus — Breeds Feb 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9420

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

Probability of Presence Summary

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

Probability of Presence (■)

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

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

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

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

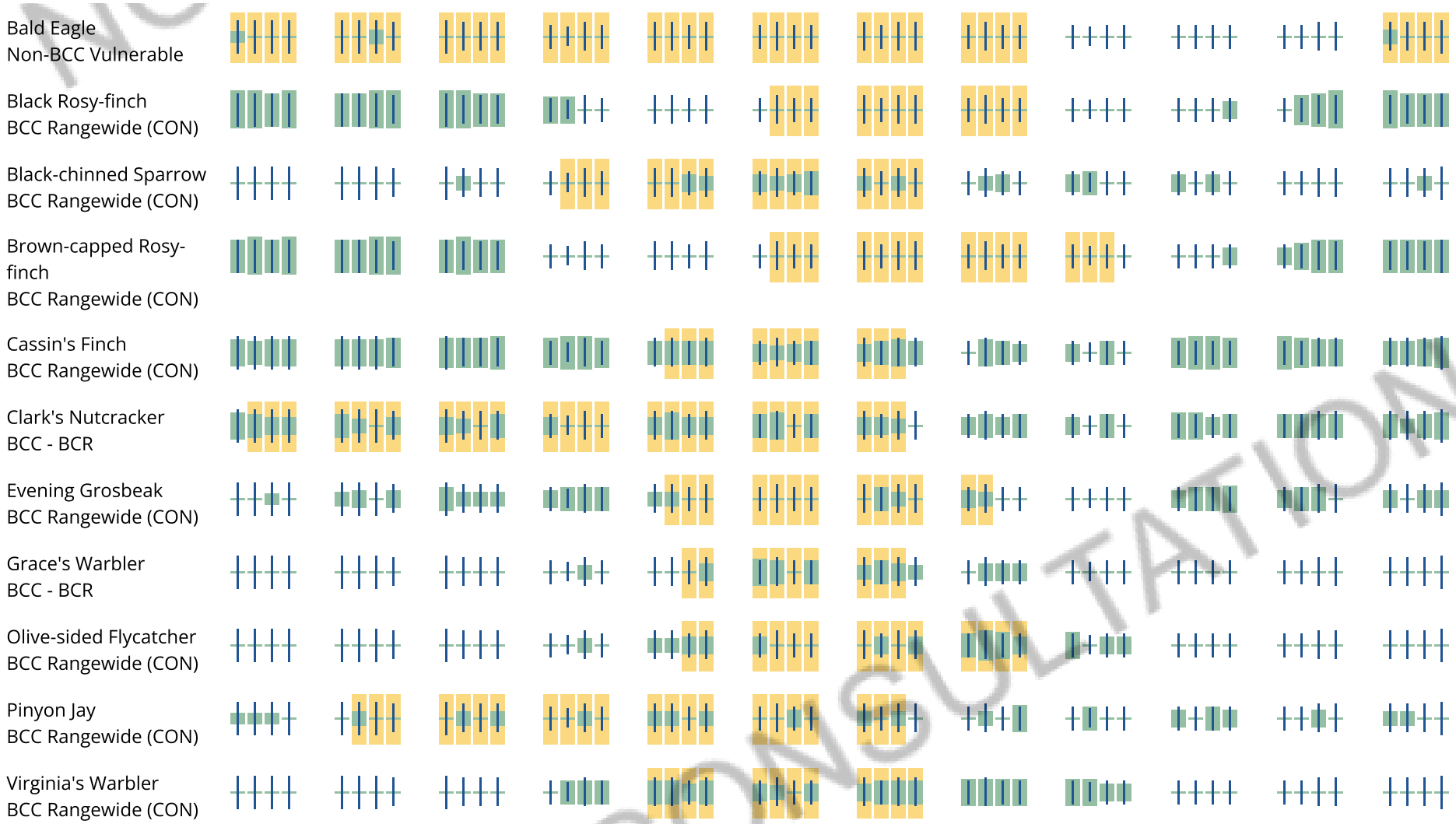
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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.



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.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX F: ENVIRODATA-NM REPORT FOR THE PROSPECTIVE PROJECT SITES

EnviroData-NM | Environmental Resource Database of New Mexico: Planning Report

This report was generated with **EnviroData-NM**—a centralized, publicly available, web application that consolidates New Mexico's environmental and public health data into an interactive map of the state. EnviroData-NM allows for agencies, the public, private industry, and conservation practitioners to obtain a comprehensive view of what's happening on New Mexico's landscapes with the goal of better informed and data- driven decision making with regard to minimizing negative impacts to human health, plants, animals, land, air, and water

Project Description

A habitat analysis of two proposed project areas at Elena Gallegos Open Space

Project Information

Project Title: Elena Gallegos Habitat Review
System Generated ID: NMEDB-48
Project Size: 6 acres
Latitude/Longitude: 35.166474 / -106.473426
County(s): BERNALILLO
Watershed(s) HUC8: Rio Grande-Albuquerque

Contact Information

Organization: Tetra Tech
Contact Name: Jacob Lobato
Contact Phone: 5054043143
Contact Email: jacob.lobato@tetratech.com
Contact Address: 6121 Indian School Rd. NE, Suite 205, Albuquerque NM 87110

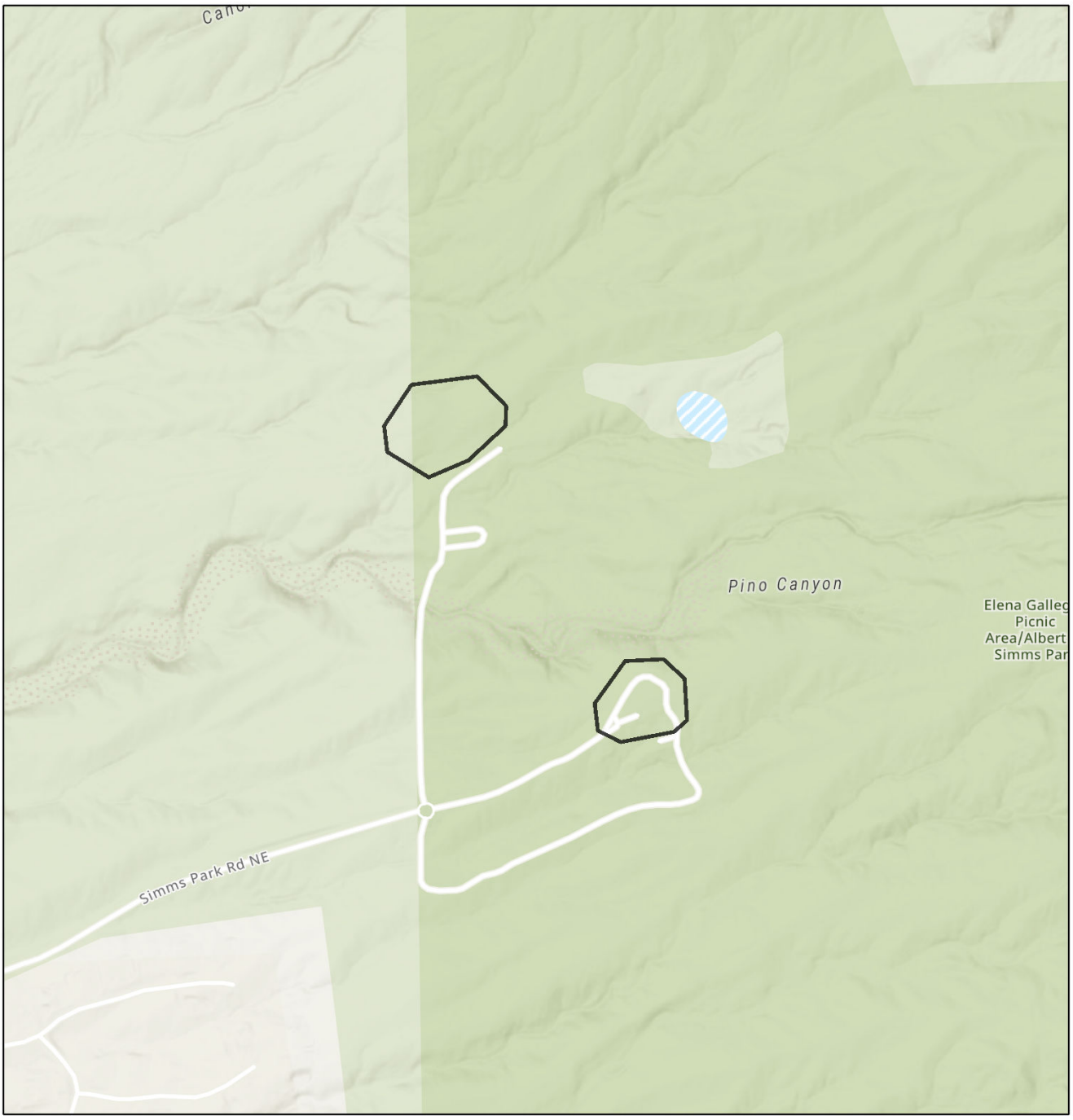
Introduction

EnviroData-NM, the Environmental Resource Database of New Mexico was created to meet the goals of The Environmental Database Act, which was passed by the New Mexico Legislature in 2021. The information contained in this report represents the results of a search of EnviroData-NM and can be used as notice to anticipate potential impacts to human health, plants, animals, land, air, and water or to identify areas of interest. This tool queries multiple publicly available environmental and public health datasets and includes a synthesis of Natural Heritage New Mexico (NHNM) data for sensitive species locations and their respective habitats.

Disclaimer

1. This is a preliminary environmental screening tool and as such does not constitute environmental consultation, land use permitting, or the review of site-specific projects.
2. This Project Report is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
3. EnviroData-NM data is dynamic and as such is constantly being updated and is not intended to be the final word on the potential distribution of special status species.
4. The data contained in EnviroData-NM are provided "as is", and the Natural Heritage New Mexico, the University of New Mexico, and any state agency providing data assume no responsibility for errors or omissions. The User assumes the entire risk associated with its use of these data. NHNM shall not be held liable for any use or misuse of the data described and/or contained herein. The User bears all responsibility in determining whether these data are fit for the User's intended use.

Elena Gallegos Habitat Review



February 17, 2023

1:9,028

Project Boundary

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Environmental Data

Ground Water Quality - Voluntary Remediation Program

New Mexico's Voluntary Remediation Program (VRP) provides incentives for the voluntary remediation of contaminated properties and encourages their redevelopment.Participants who successfully complete the program receive site closure documentation from NMED and liability protection for lenders and future purchasers.

For more information on Voluntary Remediation Program's, please visit the New Mexico Environment Department's webpage on VRPs at https://www.env.nm.gov/gwqb/ros-vrp/

No results were found.

Superfund Sites

EPA Superfund sites are polluted locations in the United States requiring a long-term response to clean up hazardous material contaminations. They were designated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.
For more information on EPA Superfund sites in New Mexico please visit https://www.env.nm.gov/gwqb/sos-nm-sites/ and for a list of active or archived EPA Superfund sites
visit https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm.

No results were found.

Ground Water Quality - State Cleanup Program

The State Cleanup Program (SCP) administers those portions of the Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC, that require the cleanup of contaminated soil and ground water to protect human health and the environment. The regulations require corrective actions to mitigate any damage caused by an unauthorized discharge, and investigation and abatement of subsurface contamination in order to attain ground water standards.

For more information on NMEDs SCP program please visit https://www.env.nm.gov/gwqb/ros-scp/.

No results were found.

Outstanding Natural Resource Waters

Outstanding National Resource Waters (ONRWs) are streams, lakes and wetlands that receive special protection against degradation under the State of New Mexico's Standards for Interstate and Intrastate Surface Waters (Water Quality Standards) and the federal Clean Water Act.

An ONRW designation is the highest level of protection against degradation that can be afforded for a waterbody under the State of New Mexico's Water Quality Standards. For more information on Outstanding Natural Resource Waters please visit https://www.env.nm.gov/surface-water-quality/onrws/.

No results were found.

NPDES Permit Locations

National Pollutant Discharge Elimination System" ("NPDES") means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. For more information on NPDES Permits please visit https://www.env.nm.gov/surface-water-quality/npdes-permits//.

No results were found.

Mine Facilities

Mining facilities permitted to discharge water by the New Mexico Environment Department. For more information on mine facility permitting please visit https://www.env.nm.gov/gwqb/permits/.

No results were found.

Ground Water Discharge Permits - Dairies

Dairies are considered to be agricultural ground water discharge permits.

No results were found.

Ground Water Permits in Project Area

NMEDs Ground Water Pollution Prevention Section (GWPPS) reviews and approves ground water Discharge Permits for discharges that have the potential to impact ground water quality pursuant to Subparts III and V of the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC). Ground water Discharge Permits address a wide variety of discharges including: * Domestic wastewater facilities * Large capacity septic tank leachfields * Reclaimed wastewater reuse * Power generating plants * Commercial laundries (when not served by sanitary sewers) * Commercial land farms for treatment of contaminated soil * Industrial discharges * Ground Water remediation systems. For more information please visit https://www.env.nm.gov/gwqb/.

No results were found.

Federal Clean Air Act Non-Attainment Areas

Areas that do not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for a National Ambient Air Quality Standards (NAAQS). For more info on Federal Clean Air Act Non-Attainment Areas please visit https://www.env.nm.gov/air-quality/permitting-section-home-page/.

No results were found.

Impaired Waters w/ Federal Clean Water Act Section 303(d) Status

Impaired streams and lakes for the 2018 reporting cycle to the EPA under the Clean Water Act Section 303(d). To learn more about the Clean Water Act Section 303(d) list of impaired water please visit https://www.epa.gov/tmdl/overview-listing-impaired-waters-under-cwa-section-303d/.

No results were found.

EPA Brownfields

Brownfields are defined as a former industrial or commercial site where future use is affected by real or perceived environmental contamination. EPA's Brownfields Program provides grants and technical assistance to communities, states, tribes and others to assess, safely clean up and sustainably reuse contaminated properties. For more information on NMEDs Brownfields Program please visit https://www.env.nm.gov/gwqb/brownfields-program/.

No results were found.

Aquifer Sensitivity

New Mexico Environment Department (NMED) is mapping areas where waters of the state may be vulnerable to contamination from septic tank discharges, and where stricter standards may be imposed. For more information please visit the NMED Ground Water Quality Bureau at https://www.env.nm.gov/gwqb/.

Sensitivity
High

Current Permits for Sources of Air Pollution

Facilities permitted by the NMED Air Quality Bureau to emit pollutants into the air. Not all facilities are active nor emitting, but is a potential list of sources of emissions. For more info on Air Quality Permits visit https://www.env.nm.gov/air-quality/permitting-section-home-page/.

No results were found.

Community Health

Poverty Levels in Project Area By Census Tract, 2016 – 2020

According to the CDC, economic stability is listed as one of the Social Determinants of Health SDOH are defined as conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes.

For more information on economic stability as an SDOH, please visit the New Mexico Department of Health's webpage on the topic.

Census Tract Name	County	Percent Population Below Poverty Line	Margin of Error
Census Tract 37.21	Bernalillo County	2.9	1.83638

Asthma Emergency Department Visits per 10,000, Age 0-17, Small Areas, 2013-2017

Small Area Name	Population Per Small Area, Age 0-17	Asthma Diagnosis, Ages 0-17, Per 10,000	Rank
33-Bernalillo County, Academy Tramway	23774	16	Very Low

Conservation Data

Special Status Plant Species within 2000 Meters of Project Area

No results were found.

Wildlife corridors link core habitats for sustaining populations across landscapes. A corridor model for cougars was developed by K. Menke (2008) for New Mexico Department of Game and Fish and was used as a surrogate model for multiple species pending development of additional species-specific models. Priority Level 1- If cougar corridor model overlaps hexagon (Using a square-mile hexagon grid across the state provided by the Western Governors' Wildlife Council). Priority Level 6 - Areas not covered by the model.

Results were found.

Designated Critical Habitat for Federal Threatened & Endangered Species

Designated Critical Habitat are specific areas within a geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection. Critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation.

Please check out the US Fish and Wildlife Service’s IPaC (Information for Planning and Consultation) tool at https://ipac.ecosphere.fws.gov/ to enter a project and get a list of intersected species and critical habitats.

No results were found.

NMDGF State Wildlife Action Plan (SWAP) Conservation Opportunity Areas (COAs)

Conservation Opportunity Areas (COA) are areas in the State considered having superior potential for conserving Species of Greatest Conservation Need (SGCN). Like all other components of the State Wildlife Action Plan, COAs provide a non-regulatory tool to help focus and prioritize statewide actions to locations where conservation actions may maximize opportunities to prevent future listings of species, and to promote recovery of species that have already been listed..

For more information on SWAP COAs please visit nmswap.org.

No results were found.

Important Plant Areas (IPAs) in Project Area

IPAs are specific places across New Mexico that support either a high diversity of sensitive plant species or are the last remaining locations of New Mexico's most endangered plants. New Mexico has identified 133 IPAs with IPA-Biodiversity Ranks that can be used to identify high priority areas for management actions. More information on IPAs can be found in the New Mexico Rare Plant Conservation Strategy.

IPA Name	Biodiversity Rank	Diversity Score	Richness
Sandia Mnts	B1	5.2	6

Important Bird Areas (IBAs)

Important Bird Areas (IBAs) are distinct areas that provide essential habitat for one or more species of birds in breeding, wintering, or migration and are considered the most important places for birds as identified by the National Audubon Society. For more information please visit the Audubon Society's web page on New Mexico IBAs here.

No results were found.

NMDGF Fisheries Management Plan Waterbodies

Fish data from New Mexico Department of Game and Fish regarding priority fish species and their management per waterbody.

No results were found.

Species of Concern

Species of Concern (SOC) are defined as species of state and/or national conservation importance where **1 is "Highest Priority" and 6 "Lowest Priority"**. Hexagons were scored based on observations for the following: federally listed Endangered, Threatened, or Candidate species; New Mexico Department of Game and Fish (NMDGF) New Mexico listed animal species (Threatened or Endangered); New Mexico State Forestry Division State Endangered Plant Species (Endangered or Threatened), and Natural Heritage New Mexico Conservation Status rankings (G1/S1 Critically Imperiled globally and within the state, respectively; G2/S2, Imperiled; G3/S3, Vulnerable; G4/S4, Apparently Secure, and G5/S5, Secure). Observations older than 1975 and with a spatial uncertainty greater than 2,500 m were excluded. Area within a designated U.S. Fish and Wildlife Service (USFWS) Critical Habitat for Endangered or Threatened species was considered "observation" data.

Priority Level 1

Federal Endangered species, OR Federal Threatened species, OR State Endangered species, OR G1 species observations

Priority Level 2

Federal Candidate species observations, OR State Threatened species observations, OR G2 species observations, OR Bald and Golden Eagle Protection Act species observations, OR modeled habitat for >15 SGCN species

Priority Level 3

G3 species observations for species (not state or federally listed), OR modeled habitat for at least one of the

following: Federal or State Endangered species, OR 11-15 SGCN species

Priority Level 4

G4 or G5 species observations that are also ranked S1 or S2 (not state or federally listed), OR modeled habitat for at least one of the following: Federal or State Threatened species, OR Federal Candidate species, OR 8-10 SGCN species

Priority Level 5

G4 or G5 species observations that are also ranked S3 (not state or federally listed), OR modeled habitat for at least one of the following: at least one G1, G2 or G3 species, OR G4 or G5 and S1 species (not state or federal listed); >3 G4 or G5 and S2 or S3 species (not state or federally listed)

Priority Level 6

None of the above or no data

A description of the Species of Concern data layer can be found in the metadata section of the NM-CHAT website .

Species of Concern Rank (1 - Highest, 6 - Lowest)	Species of Concern Rank Description
1	Federal Endangered species, OR Federal Threatened species, OR State Endangered species, OR G1 species observations

Crucial Habitat

The Western Governors Wildlife Council (WGWVC) defined Crucial Habitat as places that are expected to contain the resources necessary for the continued health of fish and wildlife populations or where important ecological communities are expected to provide high value for a diversity of fish and wildlife.

States compiled data encompassing all of the above categories and then ranked areas as "crucial habitat" using a relative, six-level prioritization scheme, where 1 **represents areas "most crucial" and 6 representing areas "least crucial"**. Crucial habitat values are in no way regulatory or imply specific avoidance or mitigation measures for a given area. Crucial habitat values should be interpreted as the relative probability, or risk, that a high-priority species or habitat would be encountered in a given area.

A description of the Crucial Habitat data layer can be found in the metadata section of the NM-CHAT website.

Crucial Habitat Rank (1 - Highest, 6 - Lowest)	Crucial Habitat Rank Description
1	Species of Concern priority level = 1, OR a Terrestrial Species of Economic and Recreational Importance priority level = 1, OR Wetland and Riparian Areas priority level = rank of 1

Energy Production Data

Utility Scale Solar and Wind Projects (on state land)

Active renewable energy leases (solar and wind) on New Mexico State Trust Lands. For more information visit EMNRD's Office of Renewable Energy webpage at https://www.nmstatelands.org/divisions/commercial-resources/renewable-energy/about-office-of-renewable-energy/.

No results were found.

Electric Transmission Lines

Transmission Lines are the system of structures, wires, insulators and associated hardware that carry electric energy from one point to another in an electric power system. Lines are operated at relatively high voltages varying from 69 kV up to 765 kV. Source: Department of Homeland Security (DHS).

No results were found.

Active Mines

Places or areas from which commercial minerals are or were removed by excavation from the Earth. This could include mines used for obtaining cement, common clay and shale, copper, crushed stone, dimension stone, gemstones, gypsum, mica, molybdenum, perlite, potash, pumice, salt, sand and gravel, sulfur, vermiculite, or zeolites. Source: United States Geological Survey (USGS).

No results were found.

State Land Ownership Data

New Mexico State Parks

For more detailed information visit EMNRD’s New Mexico State Park’s here.

No results were found.

New Mexico State Trust Lands Ownership

Ownership Codes = 0: Trust Land Surface Ownership Only; 1: Trust Land Subsurface Ownership Only; 2: Trust Land Surface and Subsurface Ownership.

No results were found.

APPENDIX G: NRCS WEB SOIL SURVEY REPORTS FOR THE PROSPECTIVE PROJECT SITES

United States Department of Agriculture

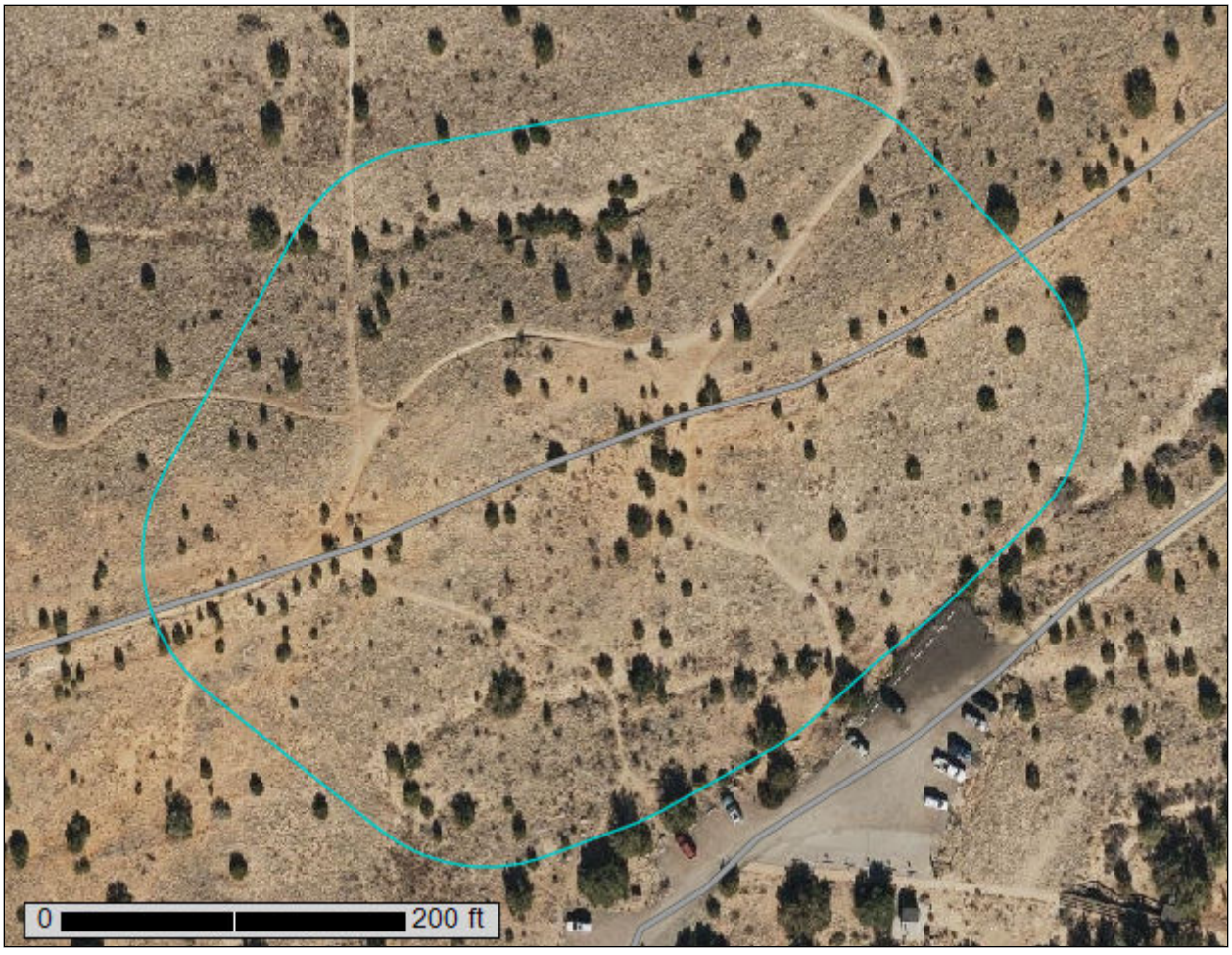
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

Site 1B with 100ft Buffer



February 17, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,170 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 17, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	4.0	99.5%
Te	Tesajo-Millett stony sandy loams	0.0	0.5%
Totals for Area of Interest		**4.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

EtC—Embudo-Tijeras complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1vwt
Elevation: 2,700 to 7,000 feet
Mean annual precipitation: 5 to 16 inches
Mean annual air temperature: 48 to 70 degrees F
Frost-free period: 130 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Embudo and similar soils: 50 percent
Tijeras and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Embudo

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: gravelly fine sandy loam
H2 - 4 to 20 inches: gravelly sandy loam
H3 - 20 to 60 inches: stratified gravelly loamy coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R042BE051NM - Sandy, Cool Desert Grassland
Hydric soil rating: No

Description of Tijeras

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: gravelly fine sandy loam
H2 - 4 to 14 inches: sandy clay loam
H3 - 14 to 19 inches: gravelly sandy loam
H4 - 19 to 60 inches: stratified very gravelly sand to very gravelly sandy loam

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R042BE051NM - Sandy, Cool Desert Grassland
Hydric soil rating: No

Minor Components

Tesajo

Percent of map unit: 5 percent
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Millett

Percent of map unit: 5 percent
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Wink

Percent of map unit: 5 percent
Ecological site: R042BE052NM - Loamy, Cool Desert Grassland
Hydric soil rating: No

Te—Tesajo-Millett stony sandy loams

Map Unit Setting

National map unit symbol: 1vys
Elevation: 5,300 to 7,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 53 to 55 degrees F
Frost-free period: 130 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Tesajo and similar soils: 41 percent
Millett and similar soils: 40 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tesajo

Setting

Landform: Flood plains, terraces, alluvial fans
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 9 inches: very stony sandy loam
H2 - 9 to 60 inches: very gravelly loam

Properties and qualities

Slope: 3 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R035XG114NM - Gravelly

Hydric soil rating: No

Description of Millett

Setting

Landform: Fan terraces, stream terraces
Landform position (three-dimensional): Riser, tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: very stony sandy loam
H2 - 4 to 10 inches: gravelly sandy clay loam
H3 - 10 to 60 inches: very gravelly sandy clay loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 19 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

Site 3 with 100ft Buffer

February 17, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:992 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 17, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Te	Tesajo-Millett stony sandy loams	2.9	100.0%
Totals for Area of Interest		**2.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

Te—Tesajo-Millett stony sandy loams

Map Unit Setting

National map unit symbol: 1vys
Elevation: 5,300 to 7,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 53 to 55 degrees F
Frost-free period: 130 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Tesajo and similar soils: 41 percent
Millett and similar soils: 40 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tesajo

Setting

Landform: Flood plains, terraces, alluvial fans
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 9 inches: very stony sandy loam
H2 - 9 to 60 inches: very gravelly loam

Properties and qualities

Slope: 3 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Description of Millett

Setting

Landform: Fan terraces, stream terraces
Landform position (three-dimensional): Riser, tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: very stony sandy loam
H2 - 4 to 10 inches: gravelly sandy clay loam
H3 - 10 to 60 inches: very gravelly sandy clay loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 19 percent
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX H: MAP OF HUC 12 UNITS PRESENT WITHIN ELENA GALLEGOS OPEN SPACE