

OETZEL PROPERTY FOREST MANAGEMENT PLAN



Prepared by Todd Haines

A business card for Todd Haines. The card is divided into two main sections. The left section is green and contains the text "FORESTRY CONSULTANT AND CAMP BOOKS LLC" in white. Below this text is a logo for "SAE CERTIFIED" and contact information: "TODD_HAINES@HOTMAIL.COM" and "505.934.1033". The right section is brown and features a tree with an open book as its canopy. Below the tree is the text "TODD HAINES CERTIFIED FORESTER".



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Overall Property Information

Landowner contact information

Name: Pat & Jack Oetzel
Address: 50 Oak Flat Rd, Tijeras NM 87059
Phone #: 505-281-3638
Tree Farm NUMBER: 162-02
County: Bernalillo
Property Description: Oak Flat Rd. Apx 10 Miles south of NM 337. Turn east.
Legal Description: T 9 N R 6 E S 20
Latitude- 34.987441
Longitude- -106.316967
Acreage / Elevation: 58.45 Acres / 7588 feet MSL

Introduction

History of the property: Written by Pat Oetzel / November 2024

The property currently known as 50 Oak Flat Rd. was part of a large parcel of land that was originally deeded to a family under the Homestead Act. The original deed, recorded on January 11, 1922, states that the land was deeded 'by the president: Warren G. Harding'. In 1992, the land was split into 3 properties. Two properties were sold and the 3rd, the land that is now 50 Oak Flat, was retained by the family. The deed for what is now '50 Oak Flat' was recorded on August 11, 1992. The split of the land and the sale of the two 'front' parcels effectively Land-locked the 58+ acres of 50 Oak Flat Rd.

Somewhere around 1991, the land-locked land was put on the market but did not sell. In the summer of 1993, we found the land and started the process of trying to buy it and get legal access to it. Getting access was more involved than the realtor or we considered - it could not be done in a matter of months. We decided to go ahead and purchase the land in December of 1993 without that access.

None of the surrounding neighbors were willing to give us access and so our only option was to petition the Forest Service for access across government land. That involved a process of jumping through a lot of hoops over a two-year period. Finally, in December of 1995 we were granted a road permit so that we could begin to use our land. We built the house and barn in 1996 and moved in a few days before Christmas in December of 1996.

We were given to understand that the land had been logged in years past and that the beaten down dirt road that became our driveway and the road to our southern border was the old logging road which shows up on some topo maps. The forest on the south side of our driveway was so dense that we could hardly walk in it until we had some serious thinning done. Over the years, we've taken advantage of government programs of shared costs thinning. The forest north of the old logging road is predominantly Ponderosa pines while the south – which must have been logged - is a totally different looking mixture of trees.

As a matter of interest: a legal opinion that goes along with the 1993 purchase states that the mineral and timber rights transfer with the land. I don't know if that is unusual or not.

Objectives

There are 5 main objectives for the Oetzel Property.

Goal 1 - Maximize the overall forest health of the property

- **Objective 1.1** – Utilize thinning and additional forest treatments to bring the tree density into an effective and sustainable basal area.

- **Objective 1.2** – Ensure any insect and disease issues within the stands of trees are under control and within the natural conditions.
- **Objective 1.3** – Take a multi resource approach to planning and implementing forest treatments.

Goal 2 – Provide for appropriate wildfire protection in this fire adapted ecosystem.

- **Objective 2.1** – Ensure that the property is kept in a natural state while minimizing the hazard presented by high density forest.
- **Objective 2.2** – Provide defensible space to structures and other improvements on the property.
- **Objective 2.3** – Utilize Firewise standards to better withstand wildfire threats.

Goal 3 – Provide for recreational opportunities on the property. Enhance the aesthetic quality of the property.

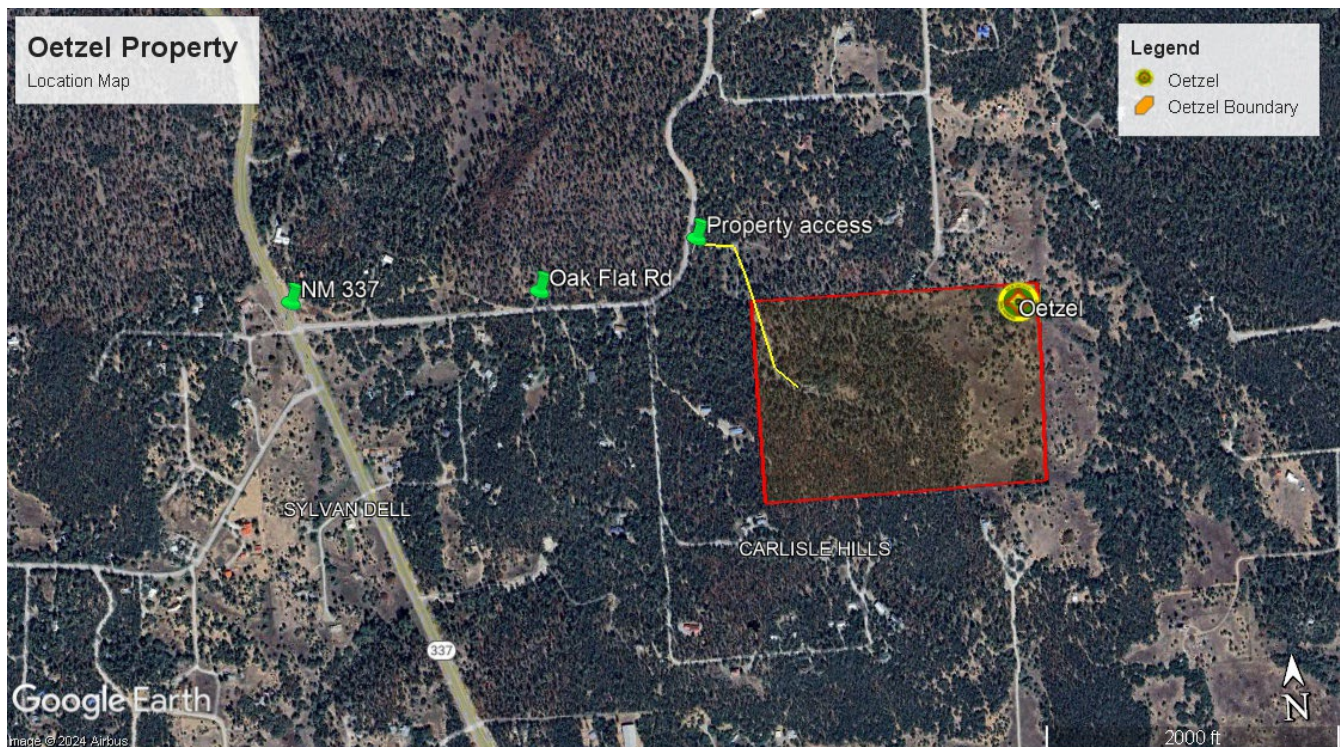
- **Objective 3.1** – Perform forestry practices that will provide for aesthetic beauty.
- **Objective 3.2** – Further develop the property for use as a recreational landscape useable for enjoyment of nature.
- **Objective 3.3** – Ensure the long-term use of the property serves to enhance the forest while providing for the enjoyment of recreational use.

Goal 4 – Perform forest treatments that target enhancing habitat for key indicator wildlife species.

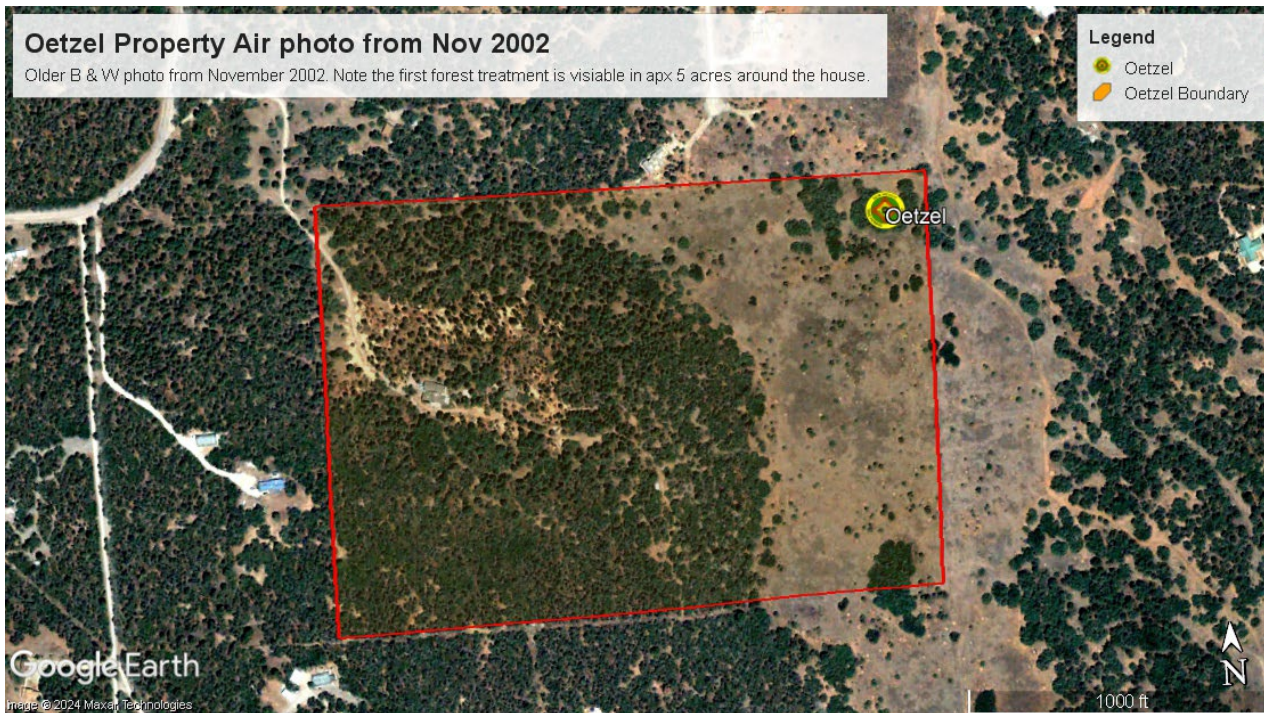
- **Objective 4.1** - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing for wildlife grazing and browsing.
- **Objective 4.2** – Contribute to the overall landscape strategy to provide two water sources per section. Look at the potential for this on this property.
- **Objective 4.3** – Consider the use of habitat improvements that will not attract unwanted wildlife to the property but may serve to add to other species suitable and useable habitat.

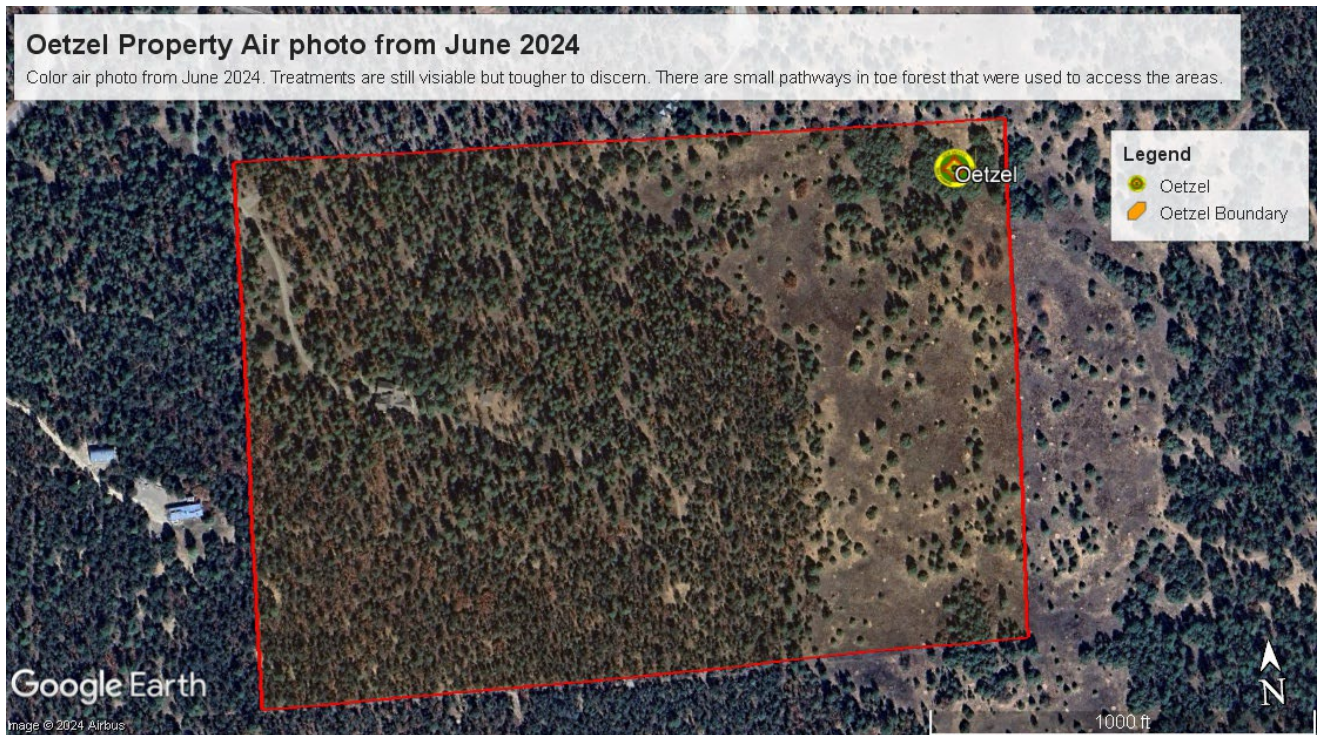
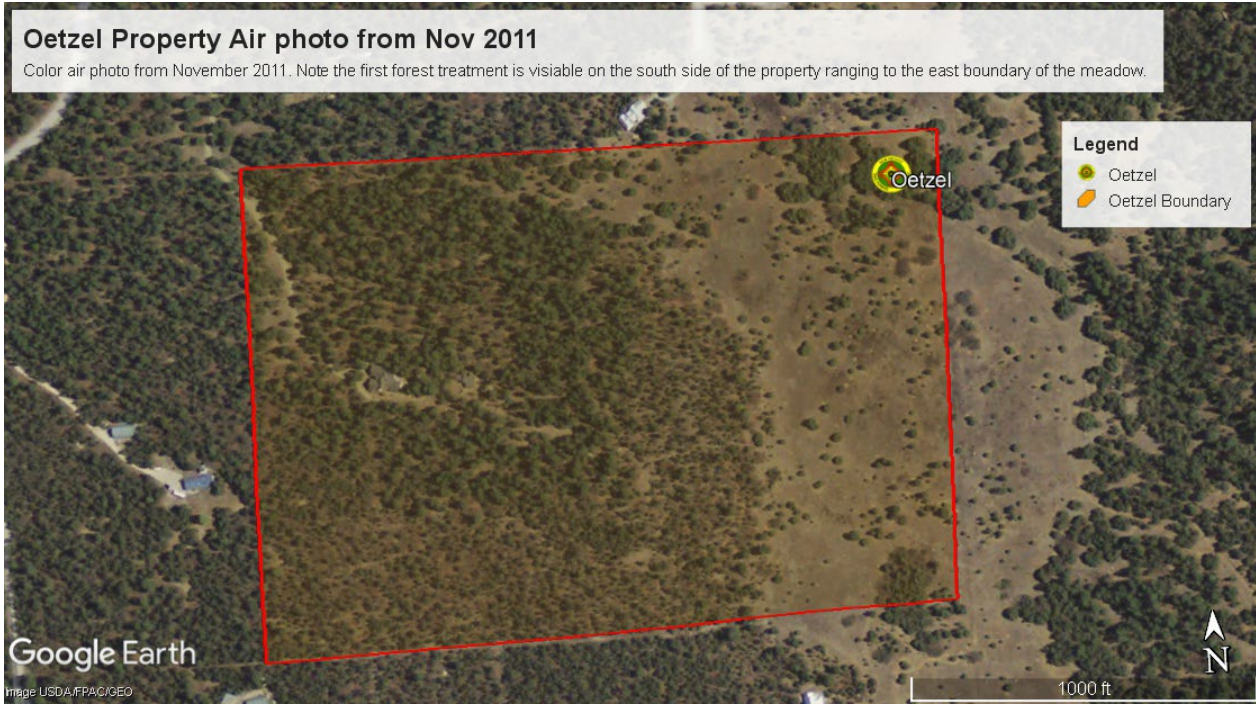
Goal 5 – Increase the production of grasses on the property.

- **Objective 5.1** – Use the slash shading method for increasing the grass production.
- **Objective 5.2** – Consider planting a seed mixture that will assist in growing the desired grass species for the objectives.
- **Objective 5.3** – Continue to monitor the grasses on the property to better use adaptive management to best implement this objective.



Oetzel Forest Management Plan – December 2024





Fish & Wildlife Habitat and Key Species

This area is classified as a piñon - juniper – ponderosa pine forest. Characteristic tree species found in this habitat type are the ponderosa pine, (*Pinus ponderosa*), the pinon pine, (*Pinus edulis*); One seed juniper, (*Juniperus monosperma*); Rocky Mountain juniper, (*Juniperus scopulorum*); alligator juniper, (*Juniperus deppeana*); and Gamble oak, (*Quercus gambelii*). Some of the “Characteristic Species” are listed below.

Characteristic shrub species include big sagebrush, (*Artemisia tridentata*); apache plume (*Fallugia paradoxa*); four-winged saltbush, (*Atriplex canescens*); and cliffrose, (*Purshia stansburiana*). Characteristic herbaceous species include Indian paintbrush, (*Castilleja miniata*); golden aster, (*Heterotheca villosa*); New Mexico thistle, (*Cirsium neomexicanum*). Grasses include blue grama, (*Bouteloua gracilis*); side oats grama, (*Bouteloua curtipendula*); prairie junegrass, (*Koeleria macrantha*); and cheatgrass, (*Bromus tectorum*). Mountain Mahogany (*Cercocarpus* sp.) is found on this property and has been encouraged to propagate. Mountain Mahogany is termed in the area to be a highly sought after plant referred to by local Biologists as “Deer Ice Cream.”

The above-mentioned species are indicative of healthy piñon - juniper habitat. The quality of the habitat is also measured by the presence of indicator species. These are the wildlife species whose presence is indicative of a healthy habitat. Some of the indicator animal species for this habitat type are as follows.

Birds:

- Bushtit (*Psaltriparus minimus*)
- Mourning Dove (*Zenaida asiatica*)
- Pinon Jay (*Gymnorhinus cyanocephalus*)
- Clark’s Nutcracker (*Nucifraga columbiana*)
- Black Chinned Hummingbird (*Archilochus alexandri*)
- Scrub Jay (*Aphelocoma coerulescens*)
- Turkey Vulture (*Cathartes aura*)
- Chipping Sparrow (*Spizella passerina*)
- Red Tailed Hawk (*Buteo jamaicensis*)
- Common Raven (*Corvus corax*)
- American Kestrel (*Falco sparverius*)
- Golden Eagle (*Aquila chrysaetos*)
- Great Horned Owl (*Bubo virginianus*)
- Prairie Falcon (*Falco mexicanus*)
- White Breasted Nuthatch (*Sitta Carolinensis*)



Nuthatches forage along tree trunks and branches and are members of the same feeding guild as woodpeckers. Unlike woodpeckers and treecreepers, however, they do not use their tails for additional support, relying instead on their strong legs and feet to progress in jerky hops. They are able to descend head-first and **hang upside-down** beneath twigs and branches. Krüper's Nuthatch can even stretch downward from an upside-down position to drink water from leaves without touching the ground.

Mammals:

- Black tail Jack Rabbit (*Lepus californicus*)
- Colorado Chipmunk (*Eutamias spp.*)
- Ringtail (*Bassariscus astutus*)
- Coyote (*Canus latrans*)
- Spotted Skunk (*Spilogale putorius*)
- Mule Deer (*Odocoileus hemionus*)
- **Mountain Lion** (*Puma (Felis) concolor*)
- Mountain Cottontail (*Sylvilagus floridanus*)
- Black Bear (*Ursus Americanus*)



Powerful, graceful and supremely adaptable, the **mountain lion** - or, cougar, panther, puma, catamount or painter - laid claim to a range that encompassed most of the New World, from the snowy fields of the Yukon to the forested coastal mountains of Tierra del Fuego and from the shores of the Pacific Ocean to the shores of the Atlantic. It occupied more territory and more environmental niches than any other land mammal (other than the *Homo sapien*) in

Reptiles:

- Collared Lizard (*Crotaphytus collaris*)

- Bull Snake (*Pituophis melanoleucus*)
- Western Rattle Snake (*Crotalus viridis*)
- Short Horned Lizard (*Phrynosoma douglassi*)

Threatened, Endangered, & State Sensitive Species

There is one endangered plant species that may be found in this habitat type. This is the Great Plains lady tresses, (*Spiranthes magnicamporum*). This is found primarily in riparian areas less than 7500 feet in elevation.

There are two rare and sensitive plant species that may be found in this area. First is gypsum sand verbena, (*Abronia bigelovii*). This is found in both grasslands and pinon juniper woodlands. Second is the Santa Fe milk vetch, (*Astragalus feensis*). This is found primarily in pinon - juniper areas. See Appendix C for more detailed information on these plants.

There are three fish species that occur in this area. There is no direct fish habitat located on this property but management of the upper portions of the habitat will affect downstream habitat, therefore endangered fish are mentioned.

The first endangered fish located in this area is the Rio Grande silvery minnow, (*Hybognathus amarus*). Habitat may be affected by the disruption of the perennial stream flow or siltation of the water. The next endangered fish species is the blunt nose shiner, (*Notropis simus*). This species is known to occur less than regularly in this county, being found most likely in the Rio Grande. The next species is also a minnow located in the above habitat, the phantom shiner, (*Notropis orca*), is found less than regularly in this county.

There are seven bird species listed as endangered that may be located in this habitat. Some of the bird species mentioned have no direct habitat located on this property but are identified in this section to better understand the off-site implications of management on this site. First is the bald eagle, (*Haliaeetus leucocephalus*). Eagle habitat is listed as statewide though sightings for Bernalillo County are rare. The next endangered bird found in the county is the common black-hawk, (*Buteogallus anthracinus*). The common black hawk is found in the lower elevations. The occurrence for this species is rare in Bernalillo County.

A bird species on the endangered list that is located to some degree statewide is the peregrine falcon, (*Falco peregrinus*). This species is highly likely to frequent Bernalillo County. The habitat is wooded areas on or near cliffs. The next endangered bird found in the Bernalillo County area is the whooping crane, (*Grus americana*). This is another species likely to occur in Bernalillo County. Its habitat consists of river-side locations along the Rio Grande valley. The next endangered bird, which is also more likely to be found in Bernalillo County, is the willow flycatcher, (*Empidonax traillii*). The primary habitat for the willow flycatcher is the riparian woodland areas. The restoration of riparian areas is the most critical component for the recovery for this species. The last endangered bird located in Bernalillo County is the Baird's sparrow, (*Ammodramus bairdii*). This species is found infrequently in this area. This is found mainly in grassland settings similar to the open meadows found on this property. Rangeland improvements will help the recovery of this species.

There are two endangered rodent species found in Bernalillo County. First is the spotted bat, (*Euderma maculatum*). This species is known to occur less than regularly in this area. Habitat includes all forest types found in the area. The unnecessary degradation of habitat in areas where these bats exist can be detrimental to their populations. The second endangered rodent is the meadow jumping mouse, (*Zapus hudsonius*). These occur regularly in Bernalillo County. A variety of rangeland management activities contribute to the loss of habitat for these mice.

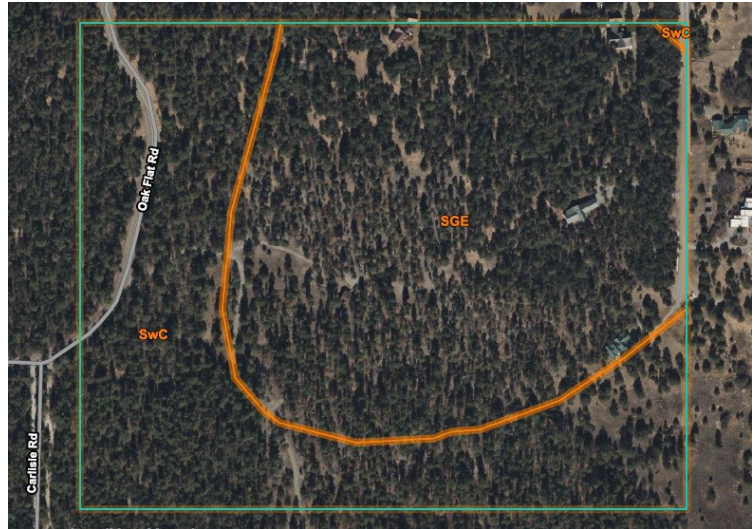
Soil Resources

The following section was analyzed by using the Natural Resource Conservation Service (NRCS) Web Soil Survey site. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx> This is an excellent tool for landowners to use to better analyze their soils.

The area delineated for the purposes of this plan was a bit larger than the property to be sure to consider off-site soils that may be impacted by activities on the property. Within the delineated area there were two identified soil types. These soil types occurred relatively equally within the property. The first of the two is Seis-Silver complex 10-40% slope (SGE), This soil type can be found between 5,300 and 7,800 feet in elevation. The depth of the water table is more than 80 inches. The available water supply for this soil type is considered very low.

The second significant soil type is the Silver and Witt soils 5-9 percent slopes which occurs over 42% of the delineated area. This soil type is generally found between 5,000 and 7,500 feet in elevation. The soil depth to the water table is more than 80 inches. The available water supply for this soil type is considered moderate.

The full soil report is available in Appendix A.



Recreational & Aesthetic Resources

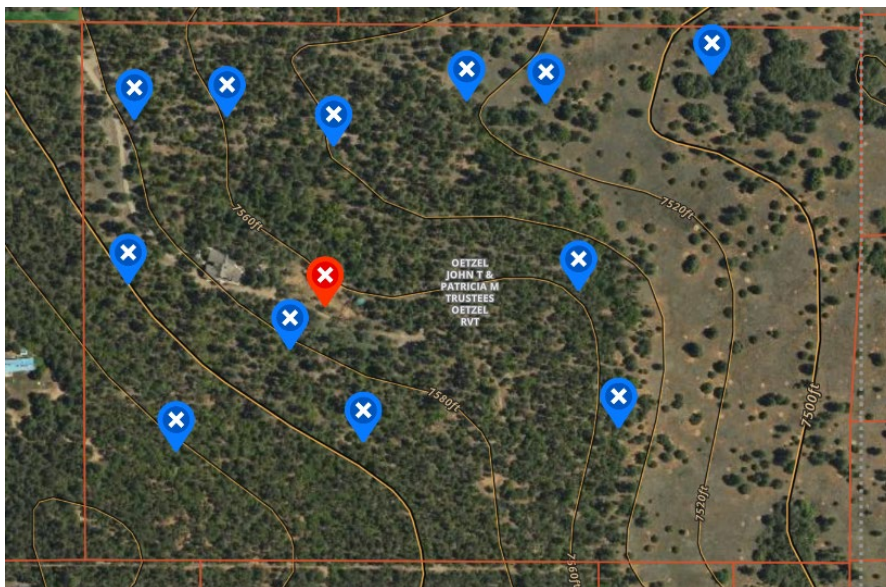
Recreational uses include both active and passive recreational enjoyment. Some lightly used 2 track roads and trails are present. Also, it was noted that cross-country ski paths were present. A passive use is enjoying nature. Deer were present during one of the visits.

The aesthetic assets of the area are typical of the outdoor setting. Viewing of the landscape including wildlife watching, viewing outdoor plants and enjoying the distant views of the mountains are current aesthetic qualities for the property. Long-term aesthetic quality can be further enhanced through forest management.

Existing unofficial user trails a two-track roadway exists on the property and should be considered for conversion to trails and looked at to gauge repairing erosion potential. This will be further discussed in the recommendations portion of this plan.

Timber Resources

A forest inventory was performed on the property to determine some basic measures on the timber assets. Timber on the site is generally classified as a wet site for piñon pine - juniper forest type and a semi dry ponderosa site. The overall stocking rate averaged 60.83 square feet of basal area per acre averaging all forest types. The recommended Basal area for this area is 40-80 square feet per acre. The mean tree diameter is 9.7 inches, so this makes the Trees Per Acre (TPA) estimate at over 119 trees. Specific stand data taken from the property is found in Appendix B. Although the Gambel Oak is included and noted on transects between plots, however, this value will not be used in the final recommendations. Oak should employ a separate treatment method that will be better explained outside of the initial treatments. Oak management will be referenced in the recommendations section.



A site index was performed on the property using a site tree from plot #9. **Site index** is a term used to describe the potential of a forest to grow on a specific "Site." A site tree that is a Dominant or co dominant tree in the stand (of trees) that is still growing (using a characteristic pointed top as an indicator of a quality site tree).

An Age- Height relationship is used to determine the sites potential to grow trees. The site tree was determined, then cored with an increment bore to count the rings. Then the tree height was measured. This data was plotted on a local site index curve to determine the corresponding site index. This specific site tree was 70 years old (at 4.5 feet uphill side DBH). Each site index table is species specific. This one was for Ponderosa pine. The height was 52.8 and the site index is determined to be a value of 60. To use this reference, it can be expected that under ideal conditions on this site a Ponderosa pine tree can be expected to reach a height of 50 feet in Approximately 70 years. Looking at the graph potential, this is in the medium range for this species of tree. See photos on following page.

Timber (forest tree species) is measured in square feet of Basal Area per acre.

Basal area is a measurement of the amount of tree area in square feet per acre that exist on the land. An acre consists of 43,560 square feet so 60 (or whatever the measure), square feet per acre (of Tree bole) is what should exist.

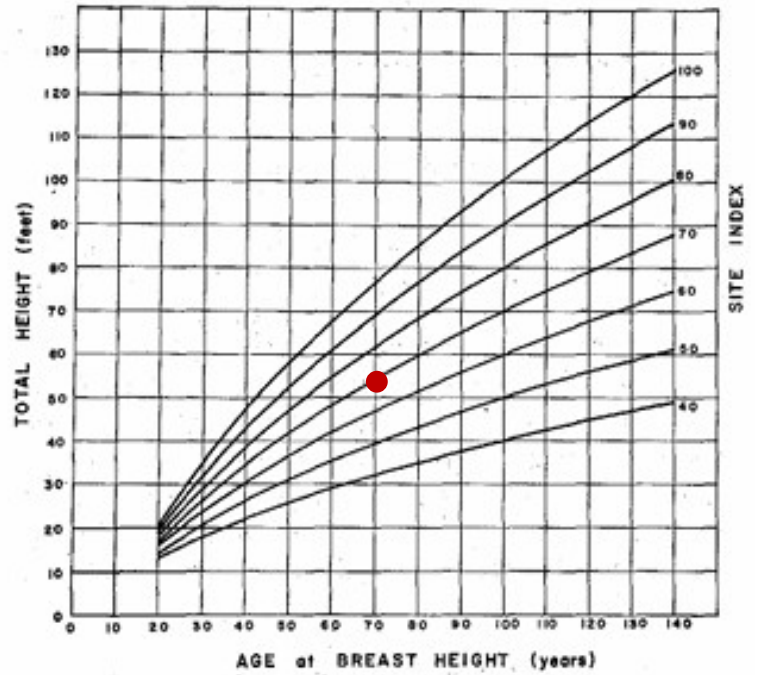
Basal area measurement is used in a variety of ways when applying forestry concepts to a stand of trees. One way is to compare the stocking to an "ideal or target" stocking level so the forester would know how many trees to remove.

The ideal stocking can signify a number of goals such as the best stocking for fire safety or the optimal timber production (getting big trees fast while keeping the most trees in the stand).

A landowner should set these goals and use this information as a basis to make informed decisions about the management of the forest.



Above: The increment bore next to the tree core sample. This sample was 70 years. (After counting the rings, the core sample is placed back into the tree to let the tree sap over the hole). **Above right:** the laser information after the tree height was measured. **Right:** The ponderosa pine site index curve used to determine the site index value.



Range

Grazing & Browse

There is evidence of wildlife browsing and livestock grazing present on the property. The livestock is not currently the landowners, As such, the table below shows the animal unit equivalents for a variety of livestock and domestic species. The following includes species likely and unlikely to be found in this area. This is intended to be used as a comparison.

The most relevant portions of this table are the animal unit equivalents for cows, bull, cattle, elk, and mule deer. One thing to note is while sheep only consume 20% of that of a cow, they tend to be more damaging to plant species. Sheep graze down into the root system of individual plants, to the point where plants may never recover at all. This has a negative impact on the forest.

Once the animal unit equivalent has been determined, the landowner needs to calculate the total forage they have available and stocking rate (amount of animals the land can support) of their land. Without getting too in depth, total forage is calculated by clipping all edible plant biomass in a plot, weighing it, and then extrapolating the data to lbs. per acre. The USDA Natural Resources Conservation Service (NRCS) may be able to assist landowners with this step. The stocking rate is calculated by dividing total forage by the amount eaten by the animal in question (generally 80% of the bodyweight of a 1,000 lb. cow). Further information can be found in the NRCS National Range and Pasture Handbook, located online at:

<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/rangepasture/?cid=stelprdb1043084>

Excellent summaries of how to calculate total forage and stocking rates are also found online, courtesy of Utah State University.

Total Forage:

http://extension.usu.edu/rangelands/files/uploads/General%20Grazing%20Management/Calaculating%20available%20forage%20NR_RM_03.pdf

Table: Commonly Used Animal Equivalents

Animal Class	Animal Unit Equivalent
Cow, 1,000 lb., Dry	0.92
Cow, 1,000 lb., with calf	1.00
Bull, mature	1.35
Cattle, 1 year old	0.60
Cattle, 2 years old	0.80
Horse, mature	1.25
Sheep, mature	0.20
Lamb, 1 year old	0.15
Goat, mature	0.15
Kid, 1 year old	0.10
Deer, white tailed, mature	0.15
Deer, mule, mature	0.20
Elk, mature	0.60
Antelope, mature	0.20
Bison, mature	1.00
Sheep, bighorn, mature	0.20

An **animal unit** is defined as the amount of forage a 1,000 lb. cow with a calf will graze in a single day. This is roughly 26 lbs. of dry weight. An **animal unit equivalent** is expressed as a ratio to the animal unit; this ratio expresses the percentage of forage an animal will eat when compared to a cow. For exaple, a mature elk has an animal unit equivalent of 0.6, so it will forage around 60% of the amount that a cow will.

Protection

Fire

Risk of wildfire is related to fuel hazard. Fuel hazard directly relates to the amount of fuel available to burn in a fire. The fuel hazard on the property is low to moderate at the present time. Fuel hazard also addresses the arrangement and continuity of the fuel, i.e. the position of the fuel, in relation to other fuels. Fuel continuity on the property is patchy and it should be difficult to sustain a fire. Localized fuel hazards may need to be addressed on the property.

Fire risk addresses the potential ignition sources for the area. Ignitions can be both human and natural caused. Human ignitions may be from neighboring homes, debris or prescribed burning, and other unforeseen person caused occurrences. Natural ignitions are usually caused by lightning.

Forest Insects

Forest insects are defined as forest pests that will in some way degrade the overall plant health of the forest. The insects discussed will be those that attack tree species.

Piñon Pitch Nodule Moth: This insect is responsible for attacking Piñon pines in New Mexico. Signs of attacks are fading branch tips and nodules of pitch found at the feeding site. This insect has one generation per year hatching in late June and early July. There are no registered forms of control for this insect.

Ips / Dendroctonus Bark Beetles: This is a common problem in New Mexico. The *Ips* and *Dendroctonus* engraver beetle uses weakened trees to complete its life cycle, killing the tree as a by-product. Trees weakened by environmental factors such as drought or intense competition with other trees are the most susceptible to bark beetle attack. Bark beetles carve a gallery in the cambium in which “girdles” the tree making it impossible to feed itself. By the time signs of attack present themselves the tree is dead. Prevention is making the trees healthy and vigorous so that they would be able to defend itself from attack. Trees do this by “pitching out” where trees emit sap that overwhelms the attacking insects.

Round headed and Flat headed Wood Borer: The round headed, and flat headed wood borer attack recently cut, dead, or dying trees. This process, while not necessarily a

detriment to the forest, can serve to damage harvested trees left in the forest for too long. These borers are most prominent after fires. They may also spread into vigas located in structures in the area. The best prevention to sustaining large populations of these borers is to ensure dead wood is removed and wood piles are dried out.

Western Cedar Borer: This is considered an aggressive pest of juniper in New Mexico. These insects will attack and seriously injure juniper trees by making larval galleries in the stem of the tree. There is no practical control or prevention known at this time.

Twig Beetles: These are frequent pests of pines in New Mexico. They attack storm damaged and shaded out twigs and branches. Twig beetle attacks can be characterized by fading branches throughout the crown of the tree. They can have 2-4 generations per year. Pruning can help with control and keeping trees vigorous will help with prevention of serious damage from attack.



Bark Beetles such as the Ips and Western bark Beetle damage can be seen on trees as pitch tubes. Pitching out is what trees do to prevent a successful attack by the beetles.

Forest Disease

Forest diseases may be a problem that affects the health of plants in the forest. Diseases include parasitic plants, fungi, and bacteria. Forest diseases may impact forest systems by degrading productivity and health of the forest. Below is a list of the most likely forest diseases that will be found in this area with descriptions of potential effects to the system.

Dwarf Mistletoe: This is the most common forest disease found in forest systems in this area. Mistletoes are parasitic plants that may kill their hosts over time. Essential water and nutrients are diverted from the host plant to the mistletoe thus depriving the host of needed food that may end up killing the host. Dwarf mistletoes, found on conifers, are species specific. That means that each dwarf mistletoe species will only infest one species of conifer and cannot spread between species. Dwarf mistletoes, unlike true mistletoes, spread by shooting their berries up to 30 feet. Dwarf mistletoes may be controlled through silvicultural means by removing infected trees from the overstory. Care should be taken when thinning trees with mistletoe as this could serve to increase the spread of the disease.

True Mistletoe: Infects juniper species in New Mexico. True mistletoe attacks trees by “stealing” essential water and nutrients from the host trees. True mistletoe is spread by birds therefore there are no silvicultural controls. Pruning can be somewhat effective.



Dwarf Mistletoe (actual photo from the property).



True Mistletoe as found on a Juniper. (*Phoradendron spp.*). These are not considered aggressive pathogens. They use the host as a water source and do not cause mortality until water availability to the host is limited.

Noxious Weeds

The following is a list of the noxious weeds identified for Bernalillo County. There are three classes of noxious weeds. These are termed class A, B, & C weeds. As defined by the NMSU cooperative extension services publication New Mexico’s Invasive Weeds, Class A weeds are not native to an ecosystem and have limited distribution within the state are placed in this class. Preventing new infestations and eliminating infestations are the highest priority as species in this class are not presently found in the state but are threatening to invade. Class B weeds are not native to the ecosystem and are presently limited to particular areas within the state. Preventing new infestations should be a priority for weeds in this class. Class C weeds are also not native to the state yet are widespread throughout the state. They require long term treatment to effectively control these populations. Below is a list of noxious weeds to be concerned with in Bernalillo County.

Class A:

- Hoary cress (*Cardaira draba*)
- Canada thistle (*Cirsium arvense*)
- Scotch thistle (Onopordum acanthium)
- Purple Loosestrife (*Lythrum salicaria*)
- Perennial Pepperweed (*Lepidium latifolium*)
- Dalmatian Toadfax (*Linaria genistifolia*)
- Camelthorn (Alhagi pseudalhagi)

Class B:

- Russian knapweed (*Acroptilon repens*)
- Musk thistle (*Carduus nutans*)

Class C:

- Field bindweed (*Convolvulus arvensis*)
- Jointed goatgrass (*Aegilops cylindrica*)

Cultural Resources

An ARMS check (Archaeology Records Management Section) of the State Historic Preservation Division was performed and showed no significant findings on the property. This check simply shows if anything has previously been identified and cataloged. This does not rule out any potential sites, however. Due to the sensitive nature of this data, a certified user for this database ran the location and provided the results. More information can be found on the following link.

[New Mexico Historic Preservation Division | Archaeological Records Management Section](#)

Recommendations

The five primary goals for the landowner are as follows:

Goal 1 - Maximize the overall forest health of the property

- **Objective 1.1** – Utilize thinning and additional forest treatments to bring the tree density into an effective and sustainable basal area.

The stands on the property are considered ideally stocked. It is recommended that tree densities average 60 square feet of basal area per acre, with individual areas ranging from 40-80 square feet per acre. This stocking rate provides an optimal rate of growth for pure Ponderosa pine stands and is also beneficial for Pinon and Juniper mixed forests. This is a forest with varying species but applying this stocking rate will achieve most of the goals for forest productivity. This rate will keep the greatest number of trees on the ground while also maximizing each trees rate of growth. Species preference when choosing what to keep should be as follows:

1. Ponderosa pine
2. Piñon Pine
3. All Juniper species

Oak management is encouraged. Oak has grown due to overstory thinning and a treatment to reduce the density in some areas back to ideal levels is recommended. Oak treatments should be slowly treated over several seasons by removing no more than 30% of the stems from each grouping in any given year. This will limit the resprouting response. When entire areas are removed a sustained treatment for 2-3 years will be

required. Persistent cutting or using an alternate method (such as prescribed grazing with goats) could be effectively used.

Within the all-ponderosa pine pockets, the best trees should be retained but also allow for a mixture of age and size classes so there will not be a gap created. Clumpy tree spacing can be used as a strategy to best make the forest look more natural and clumps of trees also serve to provide better wildlife opportunities. Openings created within the forest are also of benefit to wildlife.

Each circumstance will be different and there may be solid rational for not applying this priority. Species composition on this landscape should be somewhat modified to enhance the pine species and reduce juniper species. Over the years the Juniper species has become more prevalent than under natural conditions. Attention should be given to the potential for oak response or that too many openings too fast can create an oak flush. Some of this has occurred on the property. Be prepared to treat oak if the thinning occurs.

Forest products are almost always a byproduct of forest management for other resource objectives. The above-mentioned activities should be adequate to provide some level of sustained firewood production. Additional forest products such as poles and latillas would also be possible benefit from the forest management activities.

- **Objective 1.2** – Ensure any insect and disease issues within the stands of trees are under control and within the natural conditions.

No excessive insect or disease issues were detected on the site visits. Some isolated activity was noted, however. Keeping forest stands stocked at the levels recommended above provides trees with the maximum opportunity to resist insect activity. No major disease was detected. Consider the NM Forestry Forest Health Incentives (FHI) program as a means of cost sharing preventative and maintenance treatments to accomplish this goal.

- **Objective 1.3** – Take a multi resource approach to planning and implementing forest treatments.

With any forest management activities, it is important to understand and predict the affects that treatments will have. Thinning activities could stimulate growth in the understory species such as oak species. Thinning will also serve to optimize habitat assets not previously available to some species. Thinning may provide access to low flat branches to trees that could be used for roosting sites. Each action should be further considered for other impacts. This is a general recommendation that should be applied to all the other recommendations.

Goal 2 – Provide for appropriate wildfire protection in this fire adapted ecosystem.

- **Objective 2.1** – Ensure that the property is kept in a natural state while minimizing the hazard presented by high density forest.

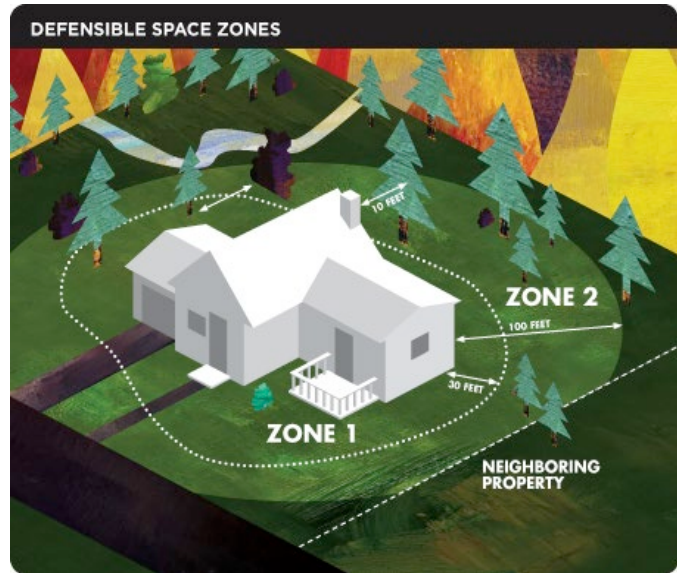
A primary goal for every forested landscape is it to keep the forest system within its “Natural Range of Variability.” Thinning, again, to the optimal levels for forest production will serve to be 80-90% of the way towards crown - fire safety. Generally, crown fires will require a 70 MPH wind event to get into the trees, in a stand of trees that is 50 square feet of basal area per acre. The recommended basal area for timber production in Ponderosa pine is 60 square feet per acre. The tradeoffs are minimal. Any area considered a fuelbreak, or slopes should be thinned a bit heavier (30 – 40 Square feet per acre) of residual to account for the conditions. Clusters of trees having higher densities would be suitable in the landscape as long as there are accompanying openings. This also helps to provide good habitat for some species found in this habitat type. This forest configuration still serves to mitigate wildfire intensities.

This entire property has been thinned over the last 25 years and meets this stocking threshold. There are always specific circumstances that could be improved to increase crown fire resistance.

- **Objective 2.2** – Provide defensible space to structures and other improvements on the property.

Various practices utilize “Zones” to convey a Firewise landscape. You will see from 2-4 “Zones” are recommended to be thinned in proximity to the home or other structures. In the illustration on this page, 2 zones are used to show that more should be thinned near the structures while less needs to be done as you get further away. Using a balanced approach to forestry keep the structures as “Vegetation free” as possible but if some special trees are left within the zone 1 area a mitigation measure should be utilized to offset the additional risk, such as a larger perimeter.

The general idea for this is to use the existing landscape position to make fires drop and be able to be handled. Access to the property by firefighting equipment is also critical to this process. Most local fire departments will come out and assess their access and provide feedback on if anything needs to be done to improve access for their equipment.



Noted that this strategy has been performed already so this should be maintained, and further assessments can be used to optimize this treatment.

- **Objective 2.3** – Utilize Firewise standards to better withstand wildfire threats.

Like the above recommendations, using Firewise standards and adapting them in a reasonable manner to this specific landscape should be a priority for the property. Firewise recommends the 3 R's of landscape management. Removal, Reduction, and Replacement are three concepts for improving the fire hazards. Removal of excess plants (trees or shrubs) in the landscape. Reduction of excess portions of plants (tree branches or overgrown portions of plants or trees) should be considered. Replacement of flammable plants with less flammable plants around the home for aesthetic purposes should be considered.

Goal 3 – Provide for recreational opportunities on the property. Enhance the aesthetic quality of the property.

- **Objective 3.1** – Perform forestry practices that will provide for aesthetic beauty.

The enhancement to the aesthetic and scenic quality of the forest is best performed by providing for the health of the forest through the other mentioned goals, Timber management, protection activities, enhancement of wildlife and habitat, along with the attention to landscape. Opening view corridors and providing for looking and walking into the landscape using strategically placed walkways and trails is the best method of achieving this. The scenic beauty of a forest is generally rated highest when the views are more than 50 yards with ground cover in moderate to abundant quantities.

Thinning to the below mentioned forestry recommendations has been found to coincide with aesthetic beauty on landscapes according to the Scenic Beauty Estimation models (SBE). This was found to be true to all but one set of respondents (Foresters). So, ignoring the biases of foresters it is likely that the perception of aesthetics on the landscape will improve by performing the recommended thinning. This should be performed

in areas that could allow views to distant mountains from select locations. Also improving the views to on site rock formations and other significant features could go a long way towards achieving this goal.

- **Objective 3.2** – Further develop the property for use as a recreational landscape. The current vision for this property for recreational use it to continue its value for active and passive endeavors. The recreational landscape will be enhanced by each subsequent land management practice employed. It is recommended that each forest management activity continue to consider tradeoffs or enhancements to the properties recreational value and should have considerations as to the effects on the forest health of the property.
- **Objective 3.3** – Ensure the long-term use of the property serves to enhance the forest while providing for the enjoyment for recreational use.

Ensuring long-term use suggests that the work is never done. Continue to achieve objectives and use adaptive management and ongoing monitoring to constantly improve the property. Once you have answered the questions, question the answers. Monitor the work and adapt to the results. Utilize natural resource professional's advice, the advice of enthusiast in wildlife of other subject areas to better understand your landscape and the interactions associated with it.

Goal 4 – Perform forest treatments that target enhancing habitat for key indicator wildlife species.

- **Objective 4.1** - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing for wildlife grazing and browsing.

Integrated into the thinning should be an opportunity to utilize excess material (thinning slash) to promote the growth of native grasses. Branches could be lopped to less than 18 inches in height and provide shading to open ground. This process greatly increases the microclimate and tends to promote increased growth of grasses.

There may be reluctance to scatter branches that will be drying out over the landscape due to fuel hazards but the tradeoff is that the fuel arrangement went from standing to on the ground and a good deal of the volume will likely be removed and utilized as wood products (Firewood, poles, Etc.)

- **Objective 4.2** – Contribute to the overall landscape strategy to provide two water sources per section (640 acres). Look at the potential for this on this property.

The overall landscape goal is to have two primary sources of water for wildlife. Water proximity is a key factor to best optimize landscapes for habitat. Strongly consider developing some sort of useable water for wildlife habitat.

- **Objective 4.3** – Consider the use of habitat improvements that will not attract unwanted wildlife to the property but may serve to add to other species suitable and useable habitat.

Habitat improvements can be as simple as paying attention while performing thinning to existing habitat features; examples are tree cavities and stick nests and being sure they are preserved. Adding to the enrichment of wildlife habitat is also partially a component of performing the above-mentioned activities. Additional steps can be added to the thinning and other operations to ensure quality habitat is created. One example is performing active management for key indicator species such as turkey. Biologists use turkey as an indicator for healthy habitats as the habitat requirements for turkey serve to represent the habitat requirements for over 200 other species in a forest. In order not to make management to confusing managing for turkey will go a long way towards habitat goals.

Goal 5 – Increase the production of grasses on the property.

- **Objective 5.1** – Use the above-mentioned slash shading method for increasing the grass production.

This activity was mentioned above but will be reiterated here. Using scattered slash over a short-term timeframe (no more than 3 years) should be looked at as an efficient way to provide for the startup of native grasses. These grasses can be seeded in or, depending on the site, may already be present and ready to fill in a site.

- **Objective 5.2** – Consider planting a seed mixture that will assist in growing the desired grass species for the objectives.

Consider planting a seed mixture that will assist in growing the desired grass species for the objectives. A seed mix is usually tailored for specific sites and elevations as well as for meeting objectives. I would encourage further research on this matter with NRCS personnel if planting seed is desired. Our recommendation is to mimic native grass compositions and promote the spread of these through the previously mentioned method.

- **Objective 5.3** – Continue to monitor the grasses on the property to better use adaptive management to best implement this objective.

The recommendation here is to learn the commonly found species and develop a log or set of sites and watch what happens as manipulations occur. Adapt to the changes to best meet the objectives. Consult natural resource professionals if there are questions along the way.

Roles of cooperating agencies for natural resource assistance and fire response:

This section was added to clarify the roles of agencies and organizations with jurisdictional responsibilities or those that can contribute meaningfully to the management of this property. Jurisdiction, for the purposes of this plan, refers to a government agency responsible for initiating responses, such as law enforcement or fire services. Additionally, non-governmental organizations (NGOs) may provide valuable support for the property. Below is a list of these cooperators and their respective duties and responsibilities.

Fire Response:

The location of the property puts the primary wildland fire response area as N6S which is the Initial Attack (IA) area of New Mexico State Forestry along with Bernalillo County.

Bernalillo County Fire Department – This is the primary responding agency for all of the traditional fire and rescue services traditionally provided by counties and municipalities. The property, being within the county coverage area, will be responded to for all needs related to fire, rescue and EMS by the Bernalillo County FD. The county does, however, share jurisdictional responsibilities with the State of New Mexico when wildland fires occur on State, County or private lands.



New Mexico State Forestry (State) – New Mexico State Forestry shares a jurisdiction with New Mexico Counties for wildland fire suppression. All fiscal management for these fires is coordinated through NM State Forestry. Additionally State Forestry by agreement can request Federal wildland resources through the “Zone Dispatch Centers.” All National Park Service, US Forest Service, Bureau of Land Management, US Fish and Wildlife service and Bureau of Indian Affairs resources along with the State Forestry and the states participating counties and municipalities are a part of these zones. Note that Bernalillo County is a fully functional and very active participant in this program.



US Forest Service Cibola NF Sandia District (Federal) – The local unit of the US Forest Service Cibola National Forest Sandia Ranger District is the closest Federal wildland agency to this property.



Law Enforcement:

Bernalillo County Sheriff's Office – The Bernalillo County Sheriff's office has a unique situation when it comes to wildland firefighting. They are a part of the New Mexico Wildland fire Resource Mobilization Plan (RMP) and have a fully qualified helicopter that is carded to perform bucket operations on wildland incidents.



New Mexico State Police - The State Police will likely be available to respond and assist other Law enforcement agencies as needed.



New Mexico State Forestry Law Enforcement -The New Mexico State Forestry Division has a small contingent of Law enforcement Officers that could also respond to an incident in the area. They will likely be plugged in to an existing Law enforcement action through another agency. The State Forestry Law enforcement is the lead agency when it comes to forestry related issues for any private property.



Federal Law Enforcement (USFS) - Federal Law enforcement will likely be natural resource officers such as officers from the US Forest Service which will be assisting in a response situation. Although they do not have a direct responsibility on private lands they will likely be coordinating with State and County officers to manage an incident.

Natural Resource Assistance:

There are many agencies and organizations available for assistance with issues related to the property but below are a few highlighted entities that are likely to be of assistance with the goals of this property.

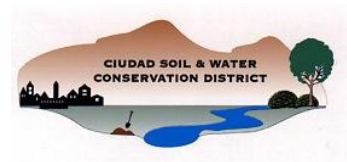
New Mexico State Forestry - The New Mexico State Forestry Division is charged with assisting private forest owners with assistance in managing their forests. The division provides everything from sound advice to assistance with obtaining resources including financial assistance in some cases, to best manage forest systems. Healthy private forests equate to healthy overall forest systems across all ownerships. The division has a number of other programs that tie in with this concept including the primary wildland fire response to private lands.



Natural Resource Conservation Service - The Natural Resource Conservation Service (NRCS) is a Federal Agency charged with working with landowners through conservation planning and assistance designed to benefit the soil, water, air, plants, and animals that result in productive lands and healthy ecosystems. The NRCS in New Mexico works directly with the New Mexico Forestry Division when it comes to forestry practices. Some funding is available on a cost share basis to perform forestry work on lands that have forest management plans in place.



Ciudad Soil and Water Conservation District - Soil and Water Conservation Districts (SWCD) serve in an advisory capacity to corresponding Federal NRCS conservation districts. The Ciudad Soil and Water Conservation District, a political subdivision of the state of New Mexico, promotes the conservation, improvement and responsible use of the natural resources on the rural and urban lands within its boundaries.



Responsibilities for SWCDs in the state are outlined in the New Mexico Soil and Water Conservation District Act (73-20-45 NMSA):

- Control and prevention of soil erosion;
- Prevention of sediment and floodwater damage;
- Furthering the conservation, development, beneficial application and proper disposal of water;
- Promoting the use of impounded water for recreation, propagation of fish and wildlife, irrigation, and for urban and industrial needs;
- By the application of these measures, conserving and developing the natural resources of the state, providing for flood control, preserving wildlife, protecting the tax base, and promoting the health, safety and general welfare of the people of New Mexico.

New Mexico Tree Farm System and Back Yard Tree Farm - The American Forest Foundations (AFF) Tree Farm Program is active in New Mexico and can provide assistance and recognition to private forest owners. Tree Farm works to give people the tools they need to be effective stewards of America's forests. Privately owned woodlands are vital to our country's clean water and air, wildlife habitat, recreational activities, and producing the jobs, wood, and paper products we all need. There is also the only active Back Yard Tree Farm program in the nation located in the East Mountains of Albuquerque. This includes landowners with less than 10 acres perform forest management on their properties.



Appendix A: Custom Soil Report

The following pages are inserted from a separate report prepared for the Oetzel Forest Management Plan - Custom Soil Resource Report for Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico



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

Oetzel Soils



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.

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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

Custom Soil Resource Report

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

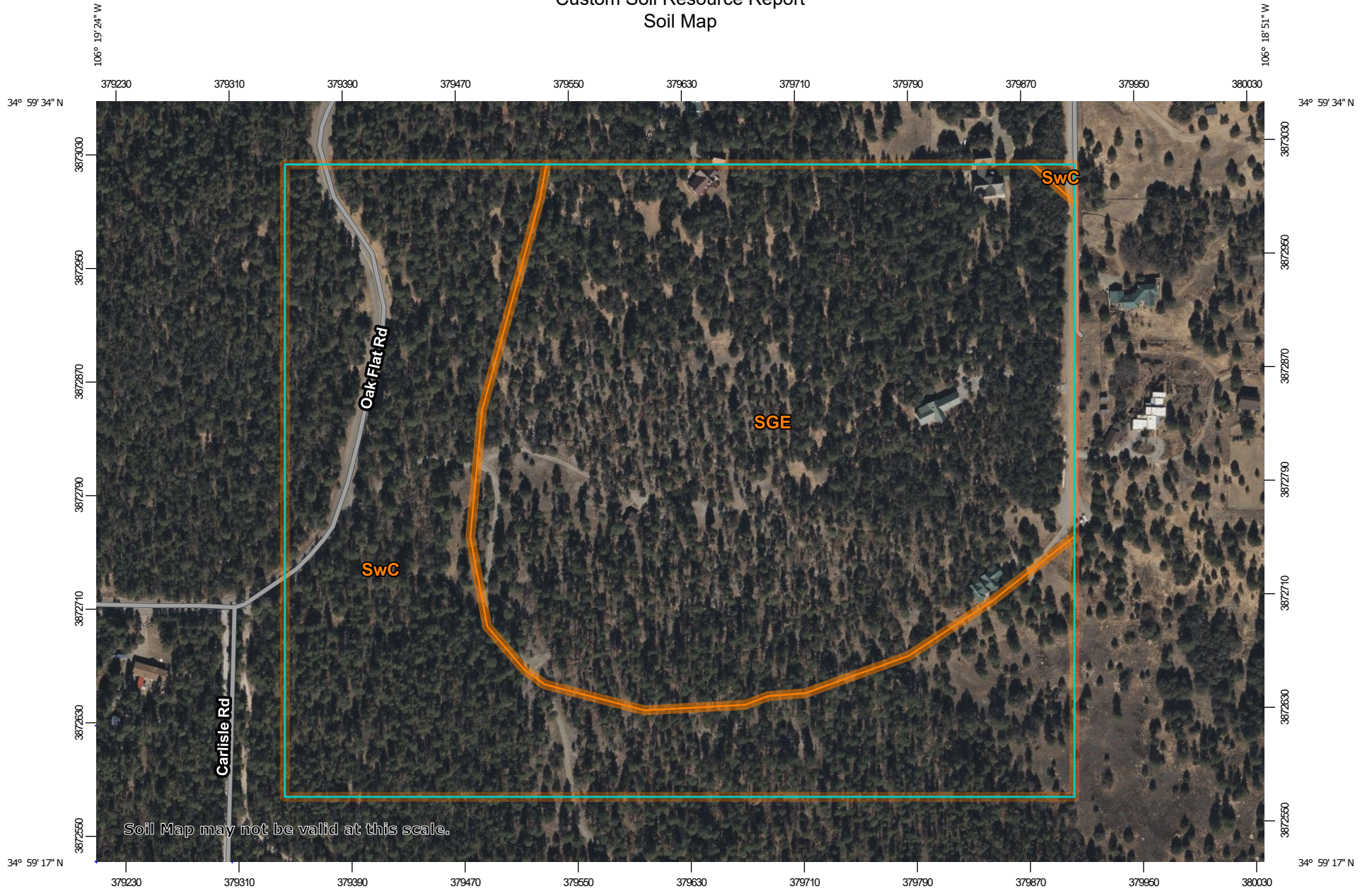
Custom Soil Resource Report

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

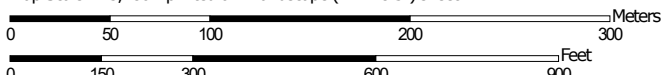
Soil Map

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: 1:3,780 if printed on A landscape (11" x 8.5") sheet.




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 19, Sep 3, 2024

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

Date(s) aerial images were photographed: Nov 26, 2021—Dec 16, 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
SGE	Seis-Silver complex, 10 to 40 percent slopes	35.5	57.6%
SwC	Silver and Witt soils, 5 to 9 percent slopes	26.2	42.4%
Totals for Area of Interest		61.8	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,

Custom Soil Resource Report

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

SGE—Seis-Silver complex, 10 to 40 percent slopes

Map Unit Setting

National map unit symbol: 1vyf
Elevation: 5,300 to 7,800 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

Seis and similar soils: 70 percent
Silver and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seis

Setting

Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Center third of mountainflank, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from igneous and sedimentary rock

Typical profile

H1 - 0 to 7 inches: stony loam
H2 - 7 to 30 inches: very stony clay loam
H3 - 30 to 34 inches: bedrock

Properties and qualities

Slope: 15 to 40 percent
Depth to restrictive feature: 25 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 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: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F039XB102NM - Juniperus monosperma-Pinus edulis/Bouteloua gracilis

Custom Soil Resource Report

Hydric soil rating: No

Description of Silver

Setting

Landform: Hills, fan piedmonts, mesas

Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope

Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 5 inches: very fine sandy loam

H2 - 5 to 31 inches: silty clay loam

H3 - 31 to 60 inches: gravelly loam

Properties and qualities

Slope: 10 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 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: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: R042CY109NM - Loamy

Hydric soil rating: No

Minor Components

Orthids

Percent of map unit: 10 percent

Ecological site: R035XA119AZ - Shallow Loamy 10-14" p.z.

Hydric soil rating: No

SwC—Silver and Witt soils, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1vyn
Elevation: 5,000 to 7,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Silver and similar soils: 55 percent
Witt and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Silver

Setting

Landform: Mesas, fan piedmonts, hills
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 5 inches: very fine sandy loam
H2 - 5 to 31 inches: silty clay loam
H3 - 31 to 60 inches: gravelly very fine sandy loam

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 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: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R042CY109NM - Loamy
Hydric soil rating: No

Description of Witt

Setting

Landform: Mesas, fan terraces, bajadas
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Residuum weathered from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: very fine sandy loam
H2 - 4 to 60 inches: sandy loam

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, 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: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R042CY109NM - Loamy
Hydric soil rating: No

Minor Components

Manzano

Percent of map unit: 5 percent
Ecological site: R042CY109NM - Loamy
Hydric soil rating: No

Laporte

Percent of map unit: 5 percent
Ecological site: R042CY107NM - Limestone Hills
Hydric soil rating: No

Escabosa

Percent of map unit: 5 percent
Ecological site: R070AY001NM - Loamy Upland
Hydric soil rating: No

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Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

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Appendix B: Forest Stand Data

Haines Forestry Field VARIABLE PLOT CRUISE																								
LANDOWNER: Oetzel										DATE: 11/14/2024										PAGE 1 OF 1				
ADDRESS: 50 Oak Flat Rd										FOREST TYPE: PIPO PIED JUMO										BA FACTOR: 10				
LOCATION:										TRACT ACRES: 58										NUM OF PLOTS: 12				
										BOARDER LINE: IN										OUT				
PLOT NO	SPECIES (CODES)	DIAMETER CLASS (Inches) and SIZE CLASS																				Seedling 0-1.99 2-3.99 4-5.99 6-7.99 8-9.99 10-11.99 12-14.99 15-16.99 17-18.99 19-20.99 21-22.99 23-24.99 25-26.99 27-28.99 29-30.99 31-32.99 33-34.99 35-36.99 37-38.99 39-40.99 41-42.99 43-44.99 45-46.99 47-48.99 49-50.99 51-52.99 53-54.99 55-56.99 57-58.99 59-60.99 61-62.99 63-64.99 65-66.99 67-68.99 69-70.99 71-72.99 73-74.99 75-76.99 77-78.99 79-80.99 81-82.99 83-84.99 85-86.99 87-88.99 89-90.99 91-92.99 93-94.99 95-96.99 97-98.99 99-100.99 101-102.99 103-104.99 105-106.99 107-108.99 109-110.99 111-112.99 113-114.99 115-116.99 117-118.99 119-120.99 121-122.99 123-124.99 125-126.99 127-128.99 129-130.99 131-132.99 133-134.99 135-136.99 137-138.99 139-140.99 141-142.99 143-144.99 145-146.99 147-148.99 149-150.99 151-152.99 153-154.99 155-156.99 157-158.99 159-160.99 161-162.99 163-164.99 165-166.99 167-168.99 169-170.99 171-172.99 173-174.99 175-176.99 177-178.99 179-180.99 181-182.99 183-184.99 185-186.99 187-188.99 189-190.99 191-192.99 193-194.99 195-196.99 197-198.99 199-200.99 201-202.99 203-204.99 205-206.99 207-208.99 209-210.99 211-212.99 213-214.99 215-216.99 217-218.99 219-220.99 221-222.99 223-224.99 225-226.99 227-228.99 229-230.99 231-232.99 233-234.99 235-236.99 237-238.99 239-240.99 241-242.99 243-244.99 245-246.99 247-248.99 249-250.99 251-252.99 253-254.99 255-256.99 257-258.99 259-260.99 261-262.99 263-264.99 265-266.99 267-268.99 269-270.99 271-272.99 273-274.99 275-276.99 277-278.99 279-280.99 281-282.99 283-284.99 285-286.99 287-288.99 289-290.99 291-292.99 293-294.99 295-296.99 297-298.99 299-300.99 301-302.99 303-304.99 305-306.99 307-308.99 309-310.99 311-312.99 313-314.99 315-316.99 317-318.99 319-320.99 321-322.99 323-324.99 325-326.99 327-328.99 329-330.99 331-332.99 333-334.99 335-336.99 337-338.99 339-340.99 341-342.99 343-344.99 345-346.99 347-348.99 349-350.99 351-352.99 353-354.99 355-356.99 357-358.99 359-360.99 361-362.99 363-364.99 365-366.99 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549-550.99 551-552.99 553-554.99 555-556.99 557-558.99 559-560.99 561-562.99 563-564.99 565-566.99 567-568.99 569-570.99 571-572.99 573-574.99 575-576.99 577-578.99 579-580.99 581-582.99 583-584.99 585-586.99 587-588.99 589-590.99 591-592.99 593-594.99 595-596.99 597-598.99 599-600.99 601-602.99 603-604.99 605-606.99 607-608.99 609-610.99 611-612.99 613-614.99 615-616.99 617-618.99 619-620.99 621-622.99 623-624.99 625-626.99 627-628.99 629-630.99 631-632.99 633-634.99 635-636.99 637-638.99 639-640.99 641-642.99 643-644.99 645-646.99 647-648.99 649-650.99 651-652.99 653-654.99 655-656.99 657-658.99 659-660.99 661-662.99 663-664.99 665-666.99 667-668.99 669-670.99 671-672.99 673-674.99 675-676.99 677-678.99 679-680.99 681-682.99 683-684.99 685-686.99 687-688.99 689-690.99 691-692.99 693-694.99 695-696.99 697-698.99 699-700.99 701-702.99 703-704.99 705-706.99 707-708.99 709-710.99 711-712.99 713-714.99 715-716.99 717-718.99 719-720.99 721-722.99 723-724.99 725-726.99 727-728.99 729-730.99 731-732.99 733-734.99 735-736.99 737-738.99 739-740.99 741-742.99 743-744.99 745-746.99 747-748.99 749-750.99 751-752.99 753-754.99 755-756.99 757-758.99 759-760.99 761-762.99 763-764.99 765-766.99 767-768.99 769-770.99 771-772.99 773-774.99 775-776.99 777-778.99 779-780.99 781-782.99 783-784.99 785-786.99 787-788.99 789-790.99 791-792.99 793-794.99 795-796.99 797-798.99 799-800.99 801-802.99 803-804.99 805-806.99 807-808.99 809-810.99 811-812.99 813-814.99 815-816.99 817-818.99 819-820.99 821-822.99 823-824.99 825-826.99 827-828.99 829-830.99 831-832.99 833-834.99 835-836.99 837-838.99 839-840.99 841-842.99 843-844.99 845-846.99 847-848.99 849-850.99 851-852.99 853-854.99 855-856.99 857-858.99 859-860.99 861-862.99 863-864.99 865-866.99 867-868.99 869-870.99 871-872.99 873-874.99 875-876.99 877-878.99 879-880.99 881-882.99 883-884.99 885-886.99 887-888.99 889-890.99 891-892.99 893-894.99 895-896.99 897-898.99 899-900.99 901-902.99 903-904.99 905-906.99 907-908.99 909-910.99 911-912.99 913-914.99 915-916.99 917-918.99 919-920.99 921-922.99 923-924.99 925-926.99 927-928.99 929-930.99 931-932.99 933-934.99 935-936.99 937-938.99 939-940.99 941-942.99 943-944.99 945-946.99 947-948.99 949-950.99 951-952.99 953-954.99 955-956.99 957-958.99 959-960.99 961-962.99 963-964.99 965-966.99 967-968.99 969-970.99 971-972.99 973-974.99 975-976.99 977-978.99 979-980.99 981-982.99 983-984.99 985-986.99 987-988.99 989-990.99 991-992.99 993-994.99 995-996.99 997-998.99 999-1000.99 1001-1002.99 1003-1004.99 1005-1006.99 1007-1008.99 1009-1010.99 1011-1012.99 1013-1014.99 1015-1016.99 1017-1018.99 1019-1020.99 1021-1022.99 1023-1024.99 1025-1026.99 1027-1028.99 1029-1030.99 1031-1032.99 1033-1034.99 1035-1036.99 1037-1038.99 1039-1040.99 1041-1042.99 1043-1044.99 1045-1046.99 1047-1048.99 1049-1050.99 1051-1052.99 1053-1054.99 1055-1056.99 1057-1058.99 1059-1060.99 1061-1062.99 1063-1064.99 1065-1066.99 1067-1068.99 1069-1070.99 1071-1072.99 1073-1074.99 1075-1076.99 1077-1078.99 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Appendix C: New Mexico Game and Fish Environmental Review & Rare Plants Guide

Santa Fe Milk Vetch	<i>Astragalus feensis</i>
La Jolla prairie clover	<i>Dalea scariosa</i>
Sapello Canyon larkspur	<i>Delphinium sapellonis</i>
Sandia alumroot	<i>Heuchera pulchella</i>
Todilto stickleaf	<i>Mentzelia todiltoensis</i>
Plank's Campion	<i>Silene plankii</i>



PROJECT INFORMATION

Project Title: Oetzel Forest Management Plan
Project Type: PLANNING, GENERAL
Latitude/Longitude (DMS): 34.990082 / -106.318615
County(s): BERNALILLO
Project Description: This is intended to inform a forest management plan. This is a document only. Forest plot data has been gathered.

REQUESTOR INFORMATION

Project Organization:
Contact Name: Todd Haines
Email Address: Todd_haines@hotmail.com
Organization: Todd Haines Forestry Consultant and Camp Books
Address: 628 First St NE Rio Rancho, New Mexico 87124, Rio Rancho NM 87124
Phone: 15059341033

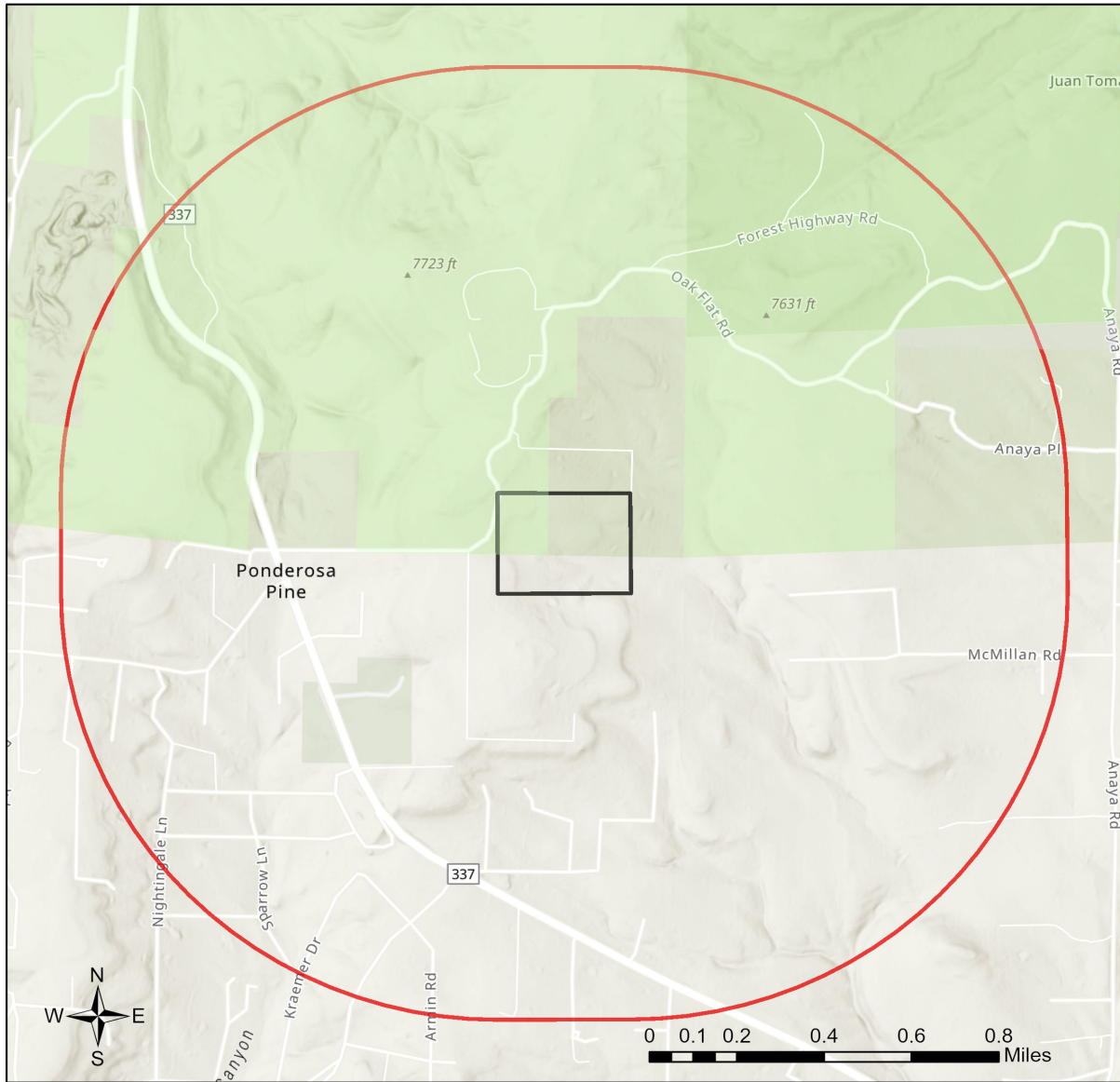
OVERALL STATUS

This report contains an initial list of recommendations regarding potential impacts to wildlife or wildlife habitats from the proposed project; see the Project Recommendations section below for further details. Your project proposal is being forwarded to a New Mexico Department of Game and Fish (Department) biologist for review to determine whether there are any additional recommendations regarding the proposed actions. A Department biologist will be in touch within 30 days if there are further recommendations regarding this project proposal.

About this report:

- This environmental review is based on the project description and location that was entered. The report must be updated if the project type, area, or operational components are modified.
- This is a preliminary environmental screening assessment and report. It is not a substitute for the potential wildlife knowledge gained by having a biologist conduct a field survey of the project area. Federal status and plant data are provided as a courtesy to users. The review is also not intended to replace consultation required under the federal Endangered Species Act (ESA), including impact analyses for federal resources from the U.S. Fish and Wildlife Service (USFWS) using their [Information for Planning and Consultation tool](#).
- This report contains information on wildlife species protected under the ESA and the [Wildlife Conservation Act \(WCA\)](#), [Species of Greatest Conservation Need \(SGCN\)](#), and Species of Economic and Recreational Importance (SERI). Species listed under the ESA are protected from take at the federal level and under the WCA are protected from take at the state level. SGCN are identified in the [State Wildlife Action Plan \(SWAP\) for New Mexico](#); all of these species are considered to be of conservation concern but not all of them are protected from take at the state or federal level. The harvest of all SERI is regulated at the state level. The Department has no authority to designate critical habitat for species listed under the WCA; only the USFWS can designate critical habitat for species listed under the ESA.
- The New Mexico Environmental Review Tool (ERT) utilizes species observation locations and species habitat suitability models, both of which are subject to ongoing change and refinement. Inclusion or omission of a species within a report cannot guarantee species presence or absence within your project area. To determine occurrence of any species listed in this report, or other wildlife that may be present within your project area, onsite surveys conducted by a qualified biologist during appropriate, species-specific survey timelines may be necessary.
- The Department encourages use of the ERT to modify proposed projects for avoidance, minimization, or mitigation of wildlife impacts. However, the ERT is not intended to be used in a repeatedly iterative fashion to adjust project attributes until a previously determined recommendation is generated. The ERT serves to assess impacts once project details are developed. The [New Mexico Crucial Habitat Assessment Tool](#), the data layers from which are included in the ERT, is the appropriate system for advising early-stage project planning and design to avoid areas of anticipated wildlife concerns and associated regulatory requirements.

Oetzel Forest Management Plan



NHNM, USGS, USFS, US Census Bureau, NMDGF
 Esri, NASA, NGA, USGS, FEMA
 City of Albuquerque, Bernalillo County, NM, Texas Parks & Wildlife, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census

Special Status Animal Species Potentially within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI	USFS	USFS SCC	BLM
Boreal Chorus Frog	Pseudacris maculata			SGCN			
Peregrine Falcon	Falco peregrinus		T	SGCN			BLM WATCH
Mountain Plover	Charadrius montanus			SGCN	Sensitive Species		BLM WATCH
Flammulated Owl	Otus flammeolus			SGCN			BLM WATCH
Western Burrowing Owl	Athene cunicularia hypugaea			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Common Nighthawk	Chordeiles minor			SGCN			
Lewis's Woodpecker	Melanerpes lewis			SGCN		USFS R3 SCC	BLM WATCH
Red-Headed Woodpecker	Melanerpes erythrocephalus			SGCN			
Williamson's Sapsucker	Sphyrapicus thyroideus			SGCN			
Olive-Sided Flycatcher	Contopus cooperi			SGCN			
Pinyon Jay	Gymnorhinus cyanocephalus			SGCN		USFS R3 SCC	BLM SENSITIVE
Clark's Nutcracker	Nucifraga columbiana			SGCN			
Juniper Titmouse	Baeolophus ridgwayi			SGCN		USFS R3 SCC	BLM WATCH
Pygmy Nuthatch	Sitta pygmaea			SGCN			
Western Bluebird	Sialia mexicana			SGCN			
Mountain Bluebird	Sialia currucoides			SGCN			
Loggerhead Shrike	Lanius ludovicianus			SGCN		USFS R3 SCC	BLM WATCH
Gray Vireo	Vireo vicinior		T	SGCN	Sensitive Species	USFS R3 SCC	BLM WATCH
Virginia's Warbler	Leiothlypis virginiae			SGCN			BLM SENSITIVE
Black-Throated Gray Warbler	Setophaga nigrescens			SGCN			BLM WATCH
Grace's Warbler	Setophaga graciae			SGCN		USFS R3 SCC	BLM WATCH
Chestnut-Collared Longspur	Calcarius ornatus			SGCN			BLM SENSITIVE

Special Status Animal Species Potentially within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI	USFS	USFS SCC	BLM
Cassin's Finch	Haemorhous cassinii			SGCN			BLM WATCH
Evening Grosbeak	Coccothraustes vespertinus			SGCN			
Spotted Bat	Euderma maculatum		T	SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Pale Townsend's Big-Eared Bat	Corynorhinus townsendii pallescens			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
New Mexican Meadow Jumping Mouse	Zapus hudsonius luteus	LE	E	SGCN	Sensitive Species		BLM SENSITIVE
Black Bear	Ursus americanus			SGCN			
Mountain Lion	Puma concolor			SGCN			
Elk	Cervus canadensis			SGCN			
Mule Deer	Odocoileus hemionus			SGCN			

Common Name hyperlink takes you to species account in bison-m.org; Scientific Name hyperlink takes you to information in [NatureServe Explorer](#); ESA = Endangered Species Act, C = Candidate, LE = Listed Endangered, LT = Listed Threatened, XN = Non-essential Experimental Population, for other ESA codes see this [website](#); WCA = Wildlife Conservation Act, E = Endangered, T = Threatened; SERI = Species of Economic and Recreational Importance; SGCN = Species of Greatest Conservation Need; USFS = U.S. Forest Service, Sensitive Species = A species likely to occur on USFS lands that is of concern for a potential reduction in population viability; SCC = Species of Conservation Concern; BLM = Bureau of Land Management, BLM SENSITIVE = A species that occurs on BLM lands and whose viability is at risk, BLM WATCH = Species that may be added to the sensitive species list in future pending new information regarding species status.

Project Recommendations

Your proposed project activities may require a custom review for assessment of potential effects to wildlife. See the "OVERALL STATUS" section above to determine the likelihood that your project will be reviewed further based on its location. A Department biologist will confirm whether any additional conservation measures are needed. You should expect to receive any additional project recommendations within 30 days of your project submission. If the "OVERALL STATUS" section indicates that no further consultation with the Department is required based on its location, then you will only receive additional project feedback from the Department if a biologist deems it necessary.

Disclaimers regarding recommendations:

- The Department provides technical guidance to support the persistence of all protected species of native fish and wildlife, including game and nongame wildlife species. Species listed within this report include those that have been documented to occur within the project area, and others that may not have been documented but are projected to occur within the project vicinity.
- Recommendations are provided by the Department under the authority of § 17-1-5.1 New Mexico Statutes Annotated 1978, to provide "communication and consultation with federal and other state agencies, local governments and communities, private organizations and affected interests responsible for habitat, wilderness, recreation, water quality and environmental protection to ensure comprehensive conservation services for hunters, anglers and nonconsumptive wildlife users".
- The Department has no authority for management of plants or Important Plant Areas. The [New Mexico Endangered Plant Program](#), under the Energy, Minerals, and Natural Resources Department's Forestry Division, identifies and develops conservation measures necessary to ensure the survival of plant species within New Mexico. Plant status information is provided within this report as a courtesy to users. Recommendations provided within the ERT may not be sufficient to preclude impacts to rare or sensitive plants, unless conservation measures are identified in coordination with the Endangered Plant Program.
- Additional coordination and/or consultation may also be necessary under the federal ESA or National Environmental Policy Act (NEPA). Further site-specific mitigation recommendations may be proposed during ESA consultation and/or NEPA analyses or through coordination with affected federal agencies.

Astragalus feensis

(Santa Fe milkvetch)

Family: Fabaceae

Scientific Name: *Astragalus feensis* M.E. Jones

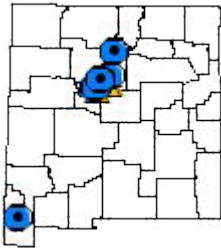
Synonyms: *Hamosa feensis* (M.E. Jones) Rydberg; *Astragalus sanctae-fidei* Tidestrom

Vernacular Name: Santa Fe milkvetch

R-E-D Code: 1-1-3

Description: Perennial; stems short, prostrate, 1-6 cm long; herbage densely villous or villosulous with basifixed hairs; leaves 4-9 cm long; leaflets (7)9-15, often folded, 3-12 mm long, 2-3 times longer than wide; stipules free; inflorescences taller than or \pm included in the foliage, with 7-12, densely or loosely disposed ascending-spreading pea-like flowers; calyx tubes \pm tubular, 4.5-6.5 mm long, calyx lobes 1-2 mm; corolla 12-16 mm long, pale pink-purple; fruits divaricate-humistrate, sessile, bilocular or nearly so, deciduous, dehiscent, body curved to 180°, triquetrous (3-sided), short-beaked, (1)2-3 cm long, 4-5 mm wide, dorsally sulcate (furrowed on side away from stem), valves leathery, reticulate, strigulose. Flowers April through June.

Similar Species: The key features of *A. feensis* are basifixed pubescence, free stipules, and curved, triquetrous, bilocular pods. When in flower, it looks similar to *A. tephrodes* var. *tephrodes*, which also has curved, triquetrous fruits and basifixed pubescence; however the fruits of *A. tephrodes* are unilocular and it grows in southwestern New Mexico. *Astragalus feensis* is related to *A. waterfallii*, another rare plant (southeastern New Mexico and adjacent Trans-Pecos Texas); however, the flowers of *A. waterfallii* are larger and its fruits are mostly straight. *Astragalus feensis* is frequently found growing with *A. missouriensis*, which has dolabriform pubescence.



Distribution: New Mexico, Bernalillo, Sandoval, Santa Fe, Tarrant, and Hidalgo counties.

Habitat: Sandy benches and gravelly hillsides in piñon-juniper woodland or plains-mesa grassland; 1,550-1,830 m (5,100-6,000 ft).

Remarks: Originally collected by Fendler in the 1840s, it was not located again until the 1940s or 1950s. That the species was not collected for a century after its discovery is curious for it is relatively common in suitable habitat within its range. There is a single recent collection for the species well outside its normal range from a roadside in Hidalgo County where probably it was introduced and will not persist.

Conservation Considerations: Some populations have undoubtedly been affected by urban or rural development, but many populations are isolated and safe from most disturbances and not threatened by the current land uses.

Important Literature (*Illustration):

Barneby, R.C. 1964. Atlas of North American *Astragalus*. Memoirs of the New York Botanical Garden 13:1-1188.

Isely, D. 1998. Native and naturalized Leguminosae (Fabaceae) of the United States (exclusive of Alaska and Hawaii). Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah.

*New Mexico Native Plants Protection Advisory Committee. 1984. A handbook of rare and endemic plants of New Mexico. University of New Mexico Press, Albuquerque.

Information Compiled By: [David Bleakly](#), 1999

Dalea scariosa

(La Jolla prairie clover)

Family: Fabaceae

Scientific Name: *Dalea scariosa* S. Watson

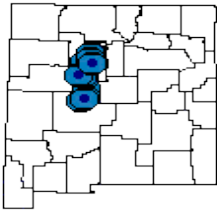
Synonyms: *Parosela scariosa* (S. Watson) A. Heller; *Petalostemon prostratum* Wooton & Standley; *Petalostemon scariosum* (S. Watson) Wemple

Vernacular Name: La Jolla prairie clover

R-E-D Code: 1-1-3

Description: Strong perennial from a stout taproot; stems prostrate to spreading, 20-70 cm long; leaves pinnately compound, 1-2.5 cm long, bright green, leaflets 5-9, thick, broadest near tip, 3-8 mm long; flowers in spikes, zygomorphic, pea-like, petals 5, pale pink to pink-purple, 7-8 mm long, the calyx with 5 pointed teeth, the vase-like base 5-ribbed and dotted with orange or reddish glands; pod 3-4 mm long, plump, dotted with small glands like the calyx. Flowers August and September.

Similar Species: There are many species of *Dalea* in New Mexico. The combination of herbaceous habit, spreading stems, bright green glabrous foliage, few small leaflets, and concolorous petals helps to distinguish this species from others.



Distribution: New Mexico, Bernalillo, Sandoval, Socorro, and Valencia counties, central Rio Grande Basin.

Habitat: Open sandy clay banks and bluffs, often along roadsides, at about 1,450-1,500 m (4,750-4,900 ft).

Remarks: This plant is often locally abundant within its restricted area of distribution, frequently occurring on sites disturbed just a few years earlier.

Conservation Considerations: The species has a resinous odor, and probably is largely unpalatable to most livestock. Plants are often found along recently disturbed road right-of-ways and, thus, may be rather early successional.

Delphinium sapellonis

(Sapello Canyon larkspur)

Family: Ranunculaceae

Scientific Name: *Delphinium sapellonis* Tidestrom

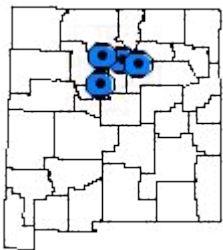
Synonyms: None

Vernacular Name: Sapello Canyon larkspur

R-E-D Code: 1-1-3

Description: Perennial herb 1.0-1.8 m tall; lower part of stem glabrous, usually green, but sometimes reddish; leaves all on stem and absent from the stem base at the time of anthesis, petioles 5-12 cm long, blades 8-16 cm long and 6-10 cm wide, palmately divided into 5 main lobes and each lobe further dissected into additional lobes or teeth; inflorescence of racemes (often branched) with 20-100 flowers, branches and pedicels with short hairs; sepals brownish- or yellowish-purple in bud and with age, glandular, hairy, lateral sepals forward pointing, 8-12 mm long, the upper sepal extended basally into a spur 8-11 mm long; petal blades, cleft, 3-5 mm long, covered with long yellowish hairs. Flowers July to September.

Similar Species: This is the only tall *Delphinium* in northern New Mexico with yellowish or brownish purple flowers. *Delphinium robustum* is morphologically very similar, but has blue or lavender flowers that are less hairy. The young (in bud) sepals of *Delphinium novomexicanum* in south-central New Mexico are bluish-purple to lavender, while the sepals (in bud) of *Delphinium sapellonis* are yellowish or brownish purple. The lower stems of *D. novomexicanum* are also usually bluish-green versus the green or reddish lower stems of *D. sapellonis*.



Distribution: New Mexico, Bernalillo, Los Alamos, Mora, Sandoval, San Miguel, Santa Fe counties, Jemez, Sandia, and southern Sangre de Cristo mountains.

Habitat: Canyon bottoms and aspen groves in lower and upper montane coniferous forest; 2,450-3,500 m (8,000-11,500 ft).

Remarks: This is a tall larkspur with rather drab flowers. It is fairly common in the Sandia Mountains, but sporadically distributed and relatively rare elsewhere. *Delphinium sapellonis* is very closely related to *D. novomexicanum* of the Sacramento-White mountains. They are sometimes not readily distinguishable, except by geographic range. Additional systematic research is needed for this species group.

Conservation Considerations: Population size has never been assessed for this species. Its response to forest fire and grazing have not been studied. Some species of *Delphinium* are poisonous to cattle, so the genus as a whole is sometimes targeted for poisonous weed control.

Heuchera pulchella (Sandia alumroot)

Family: Saxifragaceae

Scientific Name: *Heuchera pulchella* Wooton & Standley

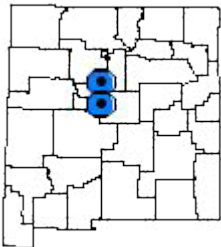
Synonyms: None

Vernacular Name: Sandia alumroot

R-E-D Code: 1-1-3

Description: Perennial, rhizomatous herb; stems greater than 15 cm tall, glandular pubescent, bearing leaves in basal clusters; leaves broadly oval to rotund, cordate, palmately lobed and broadly toothed, upper surface glabrous, lower surface glandular pubescent; inflorescence a scapose one-sided raceme, with 15+ flowers; calyx campanulate, 5-lobed, densely glandular pubescent, about 4 mm long, purplish-pink; hypanthium (tube of united sepals and petals) 1-2 mm long; petals lanceolate (sometimes filiform when dried), very narrow at the base, pink, longer than the calyx lobes; stamens 5, equal to or longer than the sepals; styles not much exerted; stigmas 2. Flowers July to September.

Similar Species: *Heuchera rubescens* (syn = *H. versicolor*) usually has a less dense inflorescence, more acutely pointed leaf lobes, shorter hypanthium, narrower petals, and more strongly exerted anthers and styles than *H. pulchella*. Other New Mexican species of *Heuchera* have either greenish-white flowers or much larger red flowers.



Distribution: New Mexico, Bernalillo, Sandoval, and Torrance counties, Sandia and Manzano mountains.

Habitat: Limestone cliffs in lower and upper montane coniferous forest; 2,450-3,260 m (8,000-10,700 ft).

Remarks: Locally abundant on the limestone face of Sandia Crest. The widespread *H. rubescens* is a variable species and the distinguishing features between it and *H. pulchella* are slight. This has caused confusion about the distribution of *H. pulchella*. Systematic studies of *Heuchera* are presently underway and will eventually clarify this issue. For now, it is best to consider *H.*

pulchella to be restricted to the Sandia and Manzano mountains.

Conservation Considerations: The cliffside habitats of this plant offer considerable protection from human impacts.

Mentzelia todiltoensis

(Todilto stickleaf)

Family: Loasaceae

Scientific Name: *Mentzelia todiltoensis* N.D. Atwood & S.L. Welsh

Synonyms: None

Vernacular Name: Todilto stickleaf

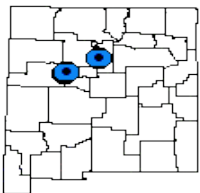
R-E-D Code: 3-1-3

Description: Perennial herb; stems several from the base, white, stout, leafy, 2.2-8 dm tall, sparsely covered with minute, reflexed or spreading barbed hairs; basal leaves not persistent; stem leaves entire or with a few short lacinate lobes, linear to narrowly oblanceolate, revolute or flat, up to 11.5 cm long, 0.5-3.8 mm wide; leaf hairs sparse, bases pustulate; inflorescence corymbosely-branched on upper part of stems with a single flower terminating the several branches; flowers sessile or subsessile, subtended by linear, entire or remotely lacinate bracts; calyx lobes spreading or reflexed in fruit; corolla and stamens sulfur yellow when opening, quickly fading to creamy white when fully open; petals usually 10 (9-12), oblanceolate, 11-13 mm long, 2.5-4 mm wide; staminodia absent or in 1 whorl, abruptly grading to fertile stamens with progressively narrower and shorter filaments; capsules subcylindrical, 8-12 mm long, 5-6 mm wide; seeds lenticular, winged. Flowers open in the evening hours, late June through September.



Similar Species: *Mentzelia perennis* is a shorter, yellow-flowered species that also occurs on gypsum outcrops, but on the gypseous strata of the Yeso Formation of south-central New Mexico. Some populations of *M. perennis* may also have entire leaves, but they are wider (more than 4 mm) and can be basally persistent on a caespitose caudex. *Mentzelia humilis* is also a strong perennial that occurs on gypsum (or caliche), but in southeastern New Mexico. Its leaves are rarely entire and usually pectinate-lacinate. *Mentzelia humilis* has only 5 very narrow petals (about 3 mm wide) and several narrow, petal-like staminodia that quickly fade to bright white when the flowers open. *Mentzelia multiflora* also has pale yellow flowers (sometimes creamy white) with 10 petals, but is a biennial with branching stems; has broader, sinuate-dentate or lacinate leaves and bracts; and broader petals (more than 5 mm wide).

The scattered, discontinuous gypsum outcrops of the Todilto and Yeso formations in central and south-central New Mexico have many different forms of perennial *Mentzelia* that appear to be derived from introgressive crossing between *M. multiflora* and *M. humilis*. Some of these forms have not been described and lack published names. *Mentzelia todiltoensis* is distinctive in these taxonomically frustrating *Mentzelia* populations on New Mexico gypsum by possessing numerous leafy stems and long, linear leaves with relatively sparse pubescence.



Distribution: New Mexico, western Bernalillo County, eastern Cibola County, western Santa Fe County, and reported without location in Socorro County.

Habitat: Outcrops of gypsum in the Todilto Formation; 1,700-1,910 m (5,600-5,840 ft).

Remarks: Atwood and Welsh (2005) included Socorro County in the distributional range of *Mentzelia todiltoensis*, but did not cite a specimen from that county. If it does occur in Socorro County, it would occur on Yeso Formation gypsum, since the Todilto Formation gypsum does not outcrop in that county (Weber and Kottlowski 1959). Atwood and Welsh (2005) also describe *M. todiltoensis* as a yellow-flowered species. However, the flowers are pale yellow only as they begin

to open (and when dried) and quickly fade to creamy white when fully open.

The two known population centers of *M. todiltoensis* are widely disjunct, but morphologically very similar. Some intervening outcrops of Todilto gypsum in Sandoval County, southern Santa Fe County, and northeastern Bernalillo County have not been thoroughly searched and may have additional populations.

Conservation Considerations: The gypsum habitat in Santa Fe County is presently being surface mined at Rosario. Todilto gypsum outcrops at the southern populations in Bernalillo and Cibola counties have high quality gypsum that is not presently being mined. This plant also occurs on the low-quality gypsum of outcrop margins where it is unlikely to be impacted by gypsum mining. Additional field surveys are needed to determine the size and extent of known populations and to locate any additional populations.

Silene plankii

(Plank's campion)

Family: Caryophyllaceae

Scientific Name: *Silene plankii* C.L. Hitchcock & Maguire

Synonyms: none

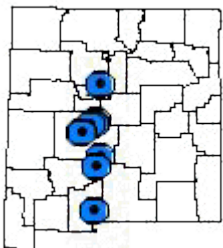
Vernacular Names: Plank's campion, Plank's catchfly

R-E-D Code: 2-1-2

Description: Low perennial, from multicapital caudex; stems ascending, 10-15 cm high, finely retrorsely grayish puberulent, becoming glandular in the inflorescence; basal and lowest stem leaves usually withered at anthesis; stem leaves 5-8 pairs, linear, acuminate, 1-1.5(2) cm long, 1-2 mm broad, largest near middle of stem, finely glandular-puberulent, especially near the inflorescence; inflorescence few-flowered, often a single terminal flower, or one or two flowers developing from lower nodes; calyces 21-23(28) mm

long, tubular, slightly constricted below, glandular-pubescent, 10-nerved, the lobes 2-4 mm long, membranous-margined and ciliolate; corolla scarlet, the claws glabrous, about 22 mm long, gradually and uniformly widening to 3-4 mm at top, scarcely auriculate, but abruptly narrowed to blades, blades about 8 mm long, bilobed 1/6-2/3 length, the lobes entire or rather deeply crenate, appendages located at least 1 mm above base of blade, 1-1.5 mm long, oblong, rather deeply crenate-lacerate; filaments well exerted; styles 3, exerted 2-4 mm; ovary one-celled. Flowering July and September.

Similar Species: This plant is one of two catchflies in New Mexico with red flowers, the other being the rather common and widespread *S. laciniata*, which has longer stems greater than 20 cm tall and often much taller, shorter calyx 1.5-2 cm long, and lacinate rather than bilobed petals.



Distribution: New Mexico, Bernalillo, Doña Ana, Sandoval, Sierra, Socorro, and Torrance counties restricted to mountains near the Rio Grande; adjacent Texas, El Paso County.

Habitat: Igneous cliffs and rocky outcrops; 1,500-2,000 m (5,000-8,000 ft).

Remarks: This plant occurs in sporadic, widespread populations. Its distribution suggests that it may have been more abundant when the climate was cooler.

Conservation Considerations: Its habitat is probably too isolated to make it susceptible to most disturbances.



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