Forest Stewardship Plan

For

Taylor and Allison Turpen

Walker Place Forest Stewardship Plan

Torrance County, New Mexico

Prepared by:

FORESTRY
CONSULTANT
AND CAMP
BOOKS LLC
TODD_HAINES@HOTMAIL.COM
505.934.1033
SAF CERTIFIED
TODD HAINES
CERTIFIED FORESTER

Plan funded by:
Estancia Basin Watershed Health, Restoration and Monitoring Project funded through a New Mexico Water Trust Board grant.

Table of Contents

Introduction

Forest stewardship plans are an essential part of a property owner's land management goals. Planning is essential to understand the capabilities of your land; forest stewardship plans ensure careful thought and foresight in planning. This preliminary tool gathers multifaceted information necessary to make informed management practices decisions beforehand.

Personal Information

Property Owner & Landowner or Representative: Taylor and Allison Turpen

Mailing Address: PO Box 140433, Broken Arrow, OK 74014

Phone: 505-280-2459 | **Email:** taylor.turpen@gmail.com

Legal Address: T6N R5 E S14 W 1/4 **Coordinates:** 34.754263, -106.394427

Plan Completion Date: February 14, 2024

Objectives - Walker Place Forest Stewardship Plan

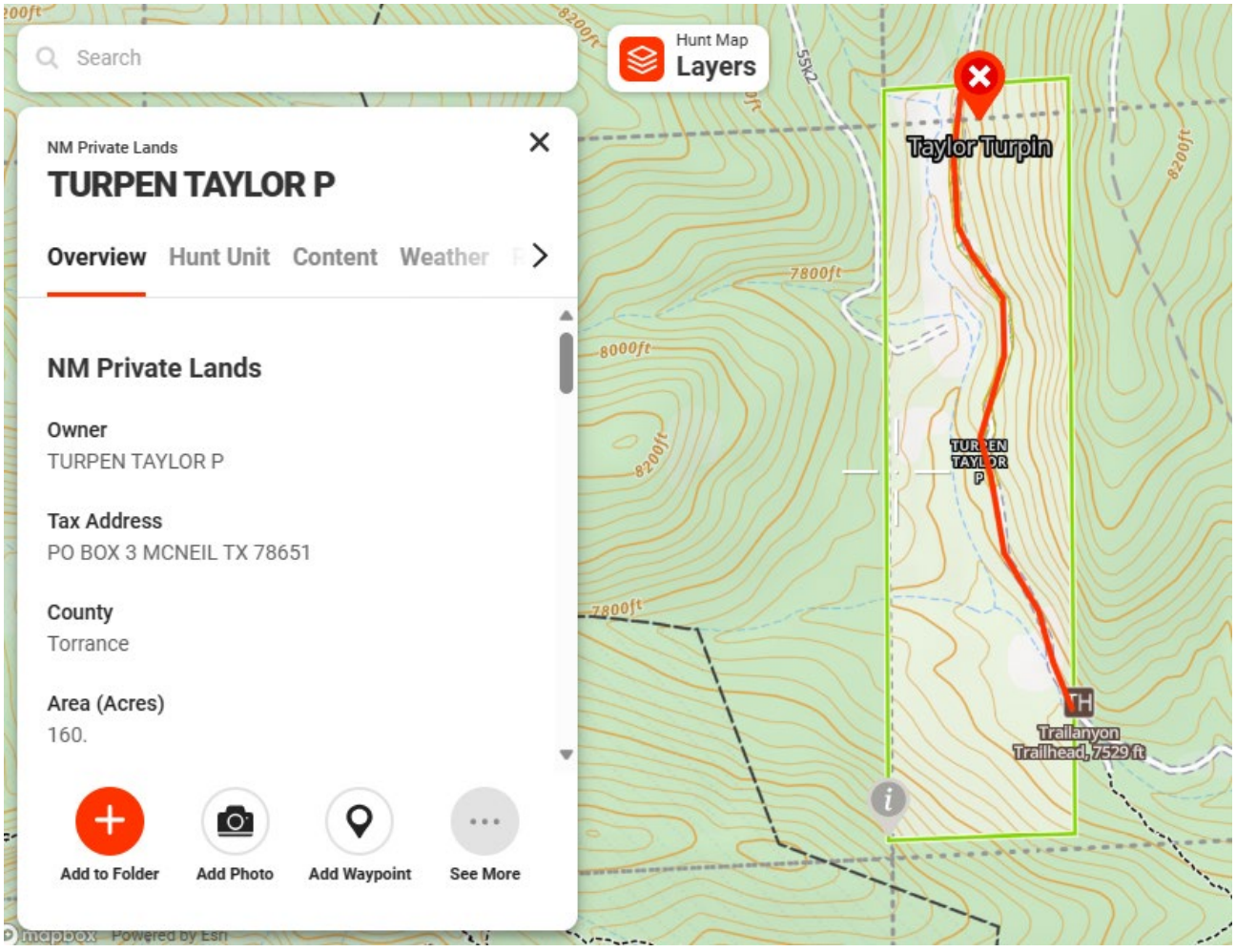
Landowner goals and objectives

1. **Goal 1: Develop a comprehensive property map showing existing roads, existing thinning, future management areas. This goal will become the "existing condition" within the Stewardship Plan and provide a planning baseline for future forest management and treatment objectives.**
    1. **Objective 1.1** - identify future management areas that can be accessed by roads. Identify potential benefits or negative impacts.
    2. **Objective 1.2** - sample existing thinning and develop a multiple year management plan. Walker Place Forest Stewardship Plan
    3. **Objective 1.3** - Review existing roads; recommend best management practices and maintenance procedures to limit actual or potential erosion.
    4. **Objective 1.4** Review existing perimeter control; recommend best management practices and maintenance to limit unwanted livestock and public access.
2. **Goal 2 – Implement forest treatments and activities that improve habitat for key indicator wildlife species.**
    1. **Objective 2.1** - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing for wildlife habitat and browse.
    2. **Objective 2.2** - where feasible, adjust thinning guidelines to the needs of a particular wildlife species.
    3. **Objective 2.3** - explore opportunities to develop water sources for the use of wildlife on the property.
3. **Goal 3 - Implement perimeter control and access to restrict unwanted livestock and public access**
    1. **Objective 3.1** - Where feasible, perform fencing and barrier maintenance to limit unwanted livestock and public access to protect the natural habitat.
4. **Goal 4 - Perform forest treatments that increase forest health benefits while reducing the risk of catastrophic stand replacement fire.**
    1. **Objective 4.1** - Review existing and future thinning areas for dwarf mistletoe infestations and include recommendations in thinning guidelines to reduce infestations.

2. **Objective 4.2** - Review existing and future thinning areas for any other disease or insect infestation and make a priority for treatment.
3. **Objective 4.2** - Review overall landscape for any lingering effects of recent drought. Where feasible, modify thinning guidelines.

Property Location

The Turpen property is located approximately 6 miles west of Tajique, New Mexico; other nearby communities include Manzano and Torreon. To reach the property from Torreon head west on the "Torreon Loop Road" also designated as Forest Road 55. A green gate is the start south of the property.



MAP 1

Property History

This property has been in the McKinley family for several generations and has now been passed down to Allison, the daughter of Marcy McKinley.

The McKinley's trace their roots in the area all the way back to the original discovery of the Fourth of July Spring (about half a mile north of the property) by AB McKinley.

Allison's grandmother Rachel Martinez is from Torreon and visits often. As a girl Allison spent every weekend at the property, hiking and riding horses.

That keeping the property in the wonderful condition that it is in is a high priority.

Property Dimensions

Turpen Property Boundaries

A formal survey was not conducted as a part of this study, all references to property boundaries in images or otherwise should be considered approximate.

MAP 2 Note the northern plot locations on the above map had to be recreated from field notes due to data issues. The plot locations on the southern portion of the map should be accurate. The development specific project should gather baseline information.

Resource Description

Fish & Wildlife Habitat and Key Species

Wildlife Conservation strategy: This property is located on the far east section of the Arizona New Mexico Mountains eco-region, in close vicinity to the Southern Shortgrass Prairie ecoregion. There are two primary terrestrial habitats that occur directly on the property with another six within proximity to note mentioning, according to the Comprehensive Wildlife Strategy for New Mexico documented by New Mexico Game and Fish (NMGFD) in 2006. SWAP Habitat. The two SWAP Habitats defined in the

document are as follows. A more detailed description is found in Appendix A in the wildlife Report Section.

The Arizona-New Mexico Mountains Ecoregion has 80 Species of Greatest Conservation Need (SGCN), excluding arthropods other than crustaceans (Table 1) *Species of Greatest Conservation Need, AZ-NM Mountains Ecoregion in NM*. The majority (45 species) reside within the Madrean Pine-Oak / Conifer-Oak Forests and Woodlands. The Rocky Mountain Mixed-Conifer Forest and Woodland was also species rich with 37 SGCN. Approximately 37 species (46%) of the SGCN in the Arizona-New Mexico Mountains Ecoregion are considered vulnerable, imperiled, or critically imperiled both statewide and nationally. Twenty-one species (26%) are nationally secure, but are considered vulnerable, imperiled, or critically imperiled in New Mexico, and 22 species (28%) are secure both statewide and nationally. Species of concern may or may not be considered threatened or endangered under the Endangered Species Act and will be listed separately below. Listed below are excerpts from the New Mexico Game and Fish Comprehensive Wildlife Conservation Strategy for New Mexico document that is located at the following website https://iwjv.org/sites/default/files/nm_swap_1.pdf

This document offers more information for the species of greatest concern for this plan.

Table 1, Species If Greatest Conservation Need, AZ-NM Mountains Ecoregion in NM

Common Name	Scientific Name
Birds	
Osprey	Pandion haliaetus
Ferruginous Hawk	Buteo regalis
Northern Goshawk	Accipiter gentilis
Golden Eagle	Aquila chrysaetos canadensis (NM)
Bald Eagle	Haliaeetus leucocephalus
Peregrine Falcon	Falco peregrinus anatum
Blue Grouse	Dendragapus obscurus
Montezuma Quail	Cyrtonyx montezumae
Scaled Quail	Callipepla squamata pallida (NM)
Sandhill Crane	Grus canadensis
Mountain Plover	Charadrius montanus
Wilson's Phalarope	Phalaropus tricolor
Band-Tailed Pigeon	Patagioenas fasciata
Mourning Dove	Zenaida macroura marginella (NM); carolinensis (NM)
Mexican Spotted Owl	Strix occidentalis
Elf Owl	Micrathene whitneyi
Burrowing Owl	Athene cunicularia
Black Swift	Cypseloides niger
Williamson's Sapsucker	Sphyrapicus thyroideus
Greater Pewee	Contopus pertinax
Olive-Sided Flycatcher	Contopus cooperi

Loggerhead Shrike	Lanius ludovicianus excubitorides (NM); sonoriensis (NM)
Gray Vireo	Vireo vicinior
Pinyon Jay	Gymnorhinus cyanocephalus
Juniper Titmouse	Baeolophus ridgwayi
Lucy's Warbler	Oreothlypis luciae
Yellow Warbler	Setophaga petechia
Black-Throated Gray Warbler	Setophaga nigrescens
Red-Faced Warbler	Cardellina rubrifrons
Grace's Warbler	Setophaga graciae
Painted Redstart	Myioborus pictus
Baird's Sparrow	Ammodramus bairdii
Grasshopper Sparrow	Ammodramus savannarum perpallidus
Yellow-Eyed Junco	Junco phaeonotus
Mammals	
New Mexico Shrew	Sorex neomexicanus
Spotted Bat	Euderma maculatum
Arizona Myotis Bat	Myotis occultus
Allen's Big-eared Bat	Idionycteris phyllotis
Black-Tailed Prairie Dog	Cynomys ludovicianus
Yellow-Nosed Cotton Rat	Sigmodon ochrognathus
Penasco Least Chipmunk	Neotamias minimus atristriatus
Abert's Squirrel	Sciurus aberti; chuscensis; mimus
American Beaver	Castor canadensis
Arizona Montane Vole	Microtus montanus arizonensis
Mexican Gray Wolf	Canis lupus baileyi
Black Bear	Ursus americanus
White-Nosed Coati	Nasua narica
Jaguar	Panthera onca
Mule Deer	Odocoileus hemionus
Coues' White-Tailed Deer	Odocoileus virginianus couesi
Amphibians	
Chiricahua Leopard Frog	Lithobates chiricahuensis
Plains Leopard Frog	Lithobates blairi
Tiger Salamander	Ambystoma tigrinum mavortium; nebulosum
Sacramento Mountains Salamander	Aneides hardii
Reptiles	
Sonoran Mud Turtle	Kinosternon sonoriense
Ornate Box Turtle	Terrapene ornata
Madrean Alligator Lizard	Elgaria kingii

Collared Lizard	Crotaphytus collaris
Sonoran Mountain King Snake	Lampropeltis pyromelana
Milk Snake	Lampropeltis triangulum
Western Diamondback Rattlesnake	Crotalus atrox
Banded Rock Rattlesnake	Crotalus lepidus klauberi
Mexican Garter Snake	Thamnophis eques
Desert Massasauga	Sistrurus catenatus
Mollusks	
Cockerell Holospira Snail	Holospira cockerelli
Jemez Mountains Woodland Snail	Ashmunella ashmuni
Dry Creek Woodland Snail	Ashmunella tetrodon
Cook's Peak Woodland Snail	Ashmunella macromphala
Iron Creek Woodland Snail	Ashmunella mendax
Silver Creek Woodland Snail	Ashmunella binneyi
Rocky Mountain snail	Oreohelix strigosa
Mineral Creek Mountain Snail	Oreohelix pilsbryi
Black Range Mountain Snail	Oreohelix metcalfei
Socorro Mountain Snail	Oreohelix neomexicana
Amber Glass Snail	Nesovitrea hammonis
Marsh Slug Snail	Deroceras heterura
Three-Toothed Column Snail	Pupilla sonorana
Spruce Snail	Microphysula ingersolli

Threatened & Endangered and State Sensitive Species

Rare plants species that could be found on the property were compiled from Torrance County's[1] rare plants lists and the five are listed in Table 4 *Rare plants in Torrance County*. There is one plant listed as Threatened, Endangered or Sensitive on either the Federal or State registry in Torrance County. The Sandia alumroot (*Heuchera pulchella*) is the only plant listed, and it is only found in the Sandia Mountains[2].

Mule Deer

Western Rattlesnake

[1] New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. http://nmrareplants.unm.edu (Latest update: 21 July 2016).
[2] http://plants.usda.gov/adv_search.html

Table 2, Rare Plants in Torrance County

Torrance County		
Scientific name	Common Name	Elevation Range
Astragalus feensis	Santa Fe milkvetch	5,100-6,000 ft.
Astragalus siliceus	Flint Mountains milkvetch	6,000-6,500 ft.
Heuchera pulchella	Sandia alumroot	8,000-10,700 ft.
Hymenoxys brachyactis	Tall bitterweed	6,900-8,200 ft.
Silene plankii	Plank's campion	5,000-9,200 ft.

Santa Fe milkvetch

Flint Mountain milkvetch

Planks campion

Sandia alumroot

Tall bitterweed

Threatened and endangered bird and mammals were found using the New Mexico Environmental Review Tool through New Mexico Department of Game and Fish. **Table 5** lists the species of concern that may occur on the property or within a buffer zone near the property. Additionally, the ERT tool provides species of special economic or recreational importance (SERI) that may occur within the buffer zone, these species can be found in table 6. See Appendix A for full report.

Table 3: Special Status Animal Species Potentially within 2000 Meters of Project Area

Common Name	Scientific Name	USFWS Endangered Species Act Listed	NMDGF Wildlife Conservation Act Listed	NMDGF SCGN / SERI
Boreal Chorus Frog	*Pseudacris maculata*			SGCN
Northern Leopard Frog	*Lithobates pipiens*			SGCN
Peregrine Falcon	*Falco peregrinus*	Threatened		SGCN
Mountain Plover	*Charadrius montanus*			SGCN
Flammulated Owl	*Otus flammeolus*			SGCN
Mexican Spotted Owl	*Strix occidentalis lucida*	Listed Threatened		SGCN
Common Nighthawk	*Chordeiles minor*			SGCN
Lewis's Woodpecker	*Melanerpes lewis*			SGCN
Red-Headed Woodpecker	*Melanerpes erythrocephalus*			SGCN
Williamson's Sapsucker	*Sphyrapicus thyroideus*			SGCN
Olive-Sided Flycatcher	*Contopus cooperi*			SGCN
Bank Swallow	*Riparia riparia*			SGCN
Pinyon Jay	*Gymnorhinus cyanocephalus*			SGCN
Clark's Nutcracker	*Nucifraga columbiana*			SGCN
Juniper Titmouse	*Baeolophus ridgwayi*			SGCN
Pygmy Nuthatch	*Sitta pygmaea*			SGCN
Western Bluebird	*Sialia mexicana*			SGCN
Mountain Bluebird	*Sialia currucoides*			SGCN
Gray Vireo	*Vireo vicinior*	Threatened		SGCN
Virginia's Warbler	*Leiothlypis virginiae*			SGCN
Black-Throated Gray Warbler	*Setophaga nigrescens*			SGCN
Grace's Warbler	*Setophaga graciae*			SGCN
Thick-billed Longspur	*Rhynchophanes mccownii*			SGCN
Cassin's Finch	*Haemorhous cassinii*			SGCN
Evening Grosbeak	*Coccothraustes vespertinus*			SGCN
Spotted Bat	*Euderma maculatum*	Threatened		SGCN
Pale Townsend's Big-Eared Bat	*Corynorhinus townsendii pallescens*			SGCN
New Mexican Meadow Jumping Mouse	*Zapus hudsonius luteus*	Listed Endangered	Endangered	SGCN
Black Bear	*Ursus americanus*			SERI
Mountain Lion	*Puma concolor*			SERI
Mule Deer	*Odocoileus hemionus*			SERI
Western Ribbon Snake	*Thamnophis proximus*	Threatened		SGCN

ESA = Endangered Species Act -

SERI = Species of Economic and Recreational Importance -

SGCN = Species of Greatest Conservation Need -

Soil & Water Resources

A custom soil survey was created using the National Resource Conservation Service soil survey webpage (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) the full report can be found in Appendix B.

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 class other than those of the major soils. Table six delineates the soil types on the property.

Table 4: Soil Resources on the Property

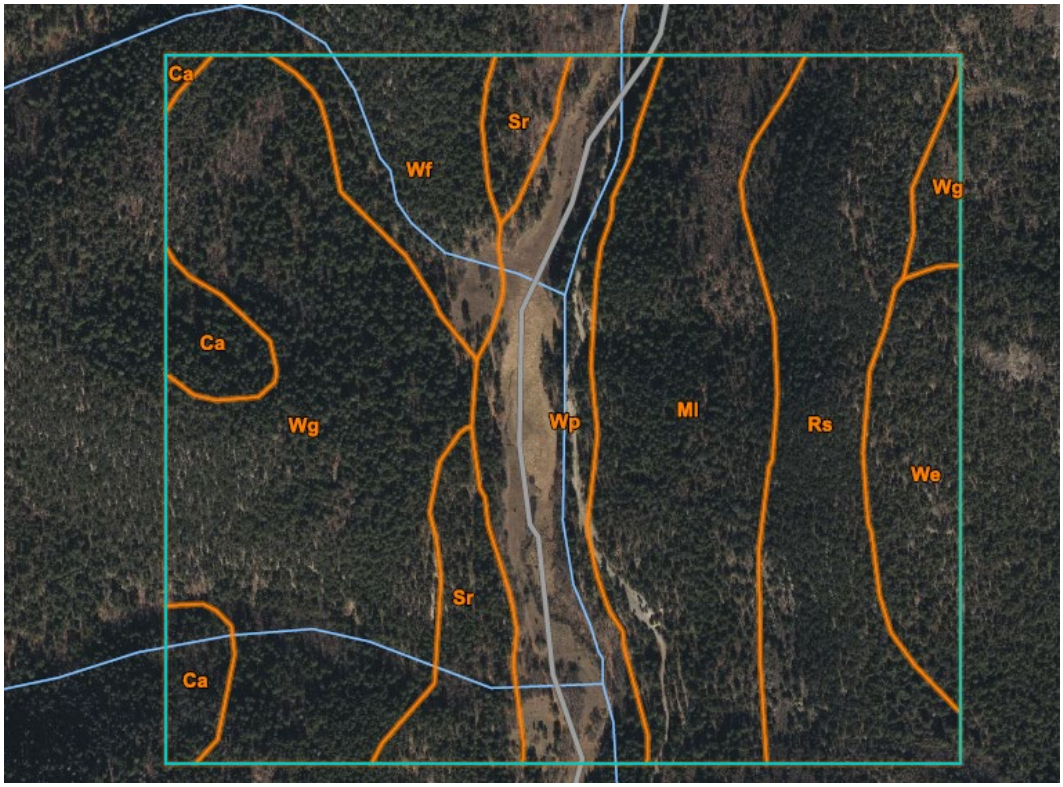
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ca	Capillo loam, 15 to 50 percent slopes	7.5	3.7%
Ml	Mirabal stony sandy loam, 40 to 80 percent slopes	38.7	19.1%
Rs	Rock outcrops and Slides	35.2	17.4%
Sr	Supervisor loam, 40 to 80 percent slopes	12.1	6.0%
We	Wilcoxson stony loam, 5 to 20 percent slopes	12.1	6.0%
Wf	Wilcoxson stony loam, 20 to 50 percent north slopes	13.1	6.5%
Wg	Wilcoxson stony loam, 15 to 45 percent south slopes	56.9	28.1%
Wp	Witt loam, 1 to 6 percent slopes	26.7	13.2%
Totals for Area of Interest		**202.4**	**100.0%**

The above table was copied from the custom Soils Report in the Appendix of this document. AOI = the Area of Interest. This Soils map was intentionally expanded slightly beyond the property boundaries to ensure any use of the soils information takes into account not only the soils directly on site but any soils that may also have an impact on the decisions made. The soils that occur on the property are (In order of abundance):

- Wild Loam 1-6% Slopes
- Supervisor Loar 40-80% Slopes

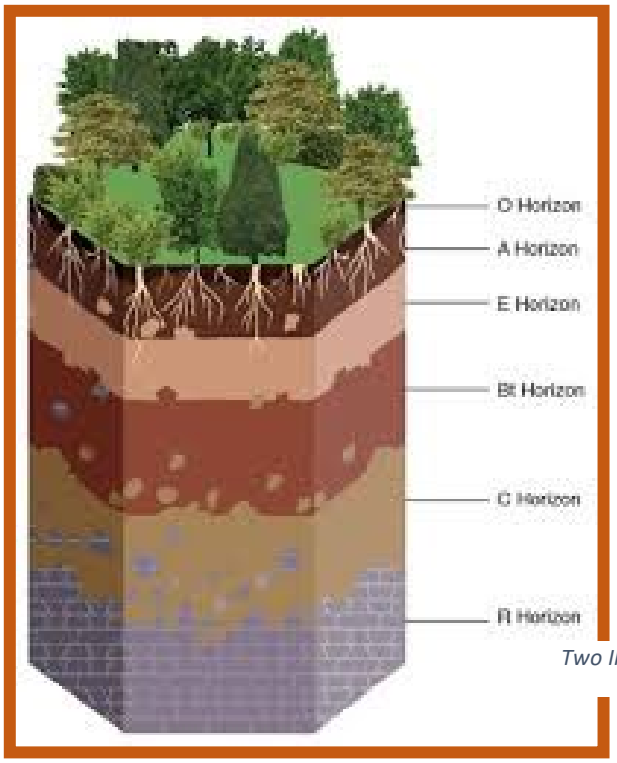
- Wilcoxin Stony Loam 20-50% North Slopes
- Mirabal Stony Sandy loam 40-80% Slopes

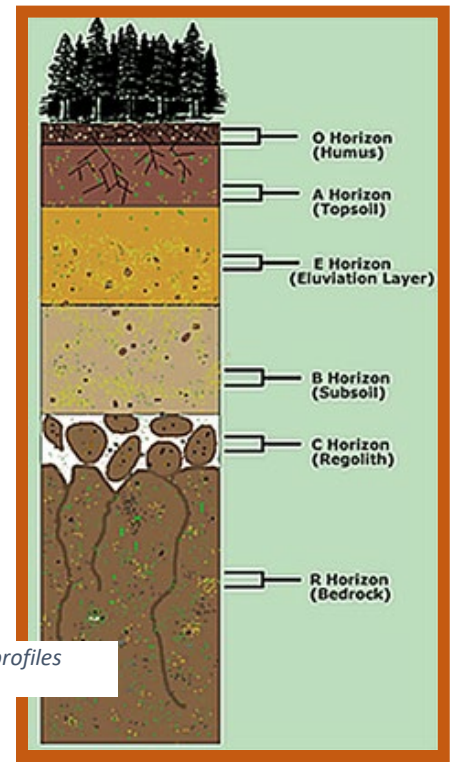
The additional soils listed in the above table are not mapped on the site but, again, may factor into decisions.



Soil map which includes the property along with neighboring USFS lands with the soil types designated.

A typical view of a soil profile, (Photo 1 and 2) *Soil Profiles,* and what these layers represent may clarify some of the descriptions. The arrangement of horizons in a soil is known as a soil profile. Soil profiles and soil horizons are used to classify and interpret the soil for various uses. Soil horizons differ in several easily seen soil properties such as color, texture, structure, and thickness. Other properties are less visible. Properties, such as chemical and mineral content, consistence, and reaction require special laboratory tests. All these properties are used to define types of soil horizons. Soil scientists use the capital letters **O**, **A**, **B**, **C**, and **E** to identify the master horizons, and lowercase letters for distinctions of these horizons. Most soils have three major horizons -- the surface horizon (**A**), the subsoil (**B**), and the substratum (**C**). Some soils have an organic horizon (**O**) on the surface, but this horizon can also be buried. The master horizon, **E**, is used for subsurface horizons that have a significant loss of minerals (eluviation). Hard bedrock, which is not soil, uses the letter **R**.





Two Illustrations of Soil profiles

Water Resources

Water is an important ecological driver in any given ecosystem, in New Mexico it is considered a valuable resource. It is important to remember that land management activities can have harmful effects outside the scope of the property boundary. The Turpen property falls under the Rio Grande HUC 8 watershed (13050001). This number references the designated Hydrological Unit Code. The United States is divided and sub-divided into successively smaller hydrologic units which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits codes based on the four levels of classification in the hydrologic unit system. For this plan, it is important to identify the individual watersheds to understand where the water may be coming from or where it's going.

Wetland Resources

There is a predominant (Unlabelled) watercourse running through the interior of the property. The source is likely spring fed from nearby Ojo Los Burros spring, Diablo Spring and an un-named spring located on the property. The Natural Resource Conservation Service (NRCS) has resource that can help improve the efficiency of the dirt tanks and help in the design of wildlife drinkers that could be installed to help improve habitat.

Another type of water delivery system that should be protected so as not to impede, pollute, or alter the flow of water, is the **acequia**, or water ditch system, used in agricultural irrigation to move water from streams and rivers to the fields. These could be earthen ditches, lined with cement, or even partially conveyed by pipe.

Timber Resources

The overall aspect of the property is a valley running North South with steep slopes defining the East and Western edges. The entire property has typical forest species with a unique cottonwood / Willow riparian area.

A Forest inventory was conducted using a 10 Basal area factor angel gauge at 18 random plots on the property. Only live trees are counted for stand basal area calculations. DBH (Diameter at Breast Height) was used for measuring Ponderosa pine and Douglass Fir. DRC (Diameter at Root Collar) for Juniper trees.

Appendix C defines Basal Area and how to calculate it.

Some of the following tree species and understory species were found on the property:

Ponderosa pine: (*Pinus Ponderosa*) may be referred to as the Western Yellow Pine, Western Longleaf, or Ponderosa White Pine. This is one of the most prevalent tree species throughout the mountains of the western states. Ponderosa trees can be found near sea level in Washington and up to 10,000 ft. in Arizona. Older Ponderosa pines have a distinct orange color to their widely cracked bark and an aromatic scent. John Muir once said, "Of all Pines, this one gives forth the finest music to the winds." This species covers an area of 1,000,000 square miles on our planet's surface. This may be due to the fact that they will grow in a variety of geological and soil types including limestone, basalt, gravel or sandy clay-loam, and even pumice rock of old lava flows. They may also live on rocky cliffs that have little soil at all. In the arid Rocky Mountains this tree typically reaches a height of 60-125 ft. If man, fire and beetle permits, these trees may live to be 250-500 years old.

Douglass Fir: (*Pseudotsuga menziesii)* The Douglass Fir is a common tree to the Rockey Mountain region and is found in abundance in the New Mexico higher elevations. The Scientific name literally means "False Henlock" as Tsuga is the genus name for Hemlock. The Douglass fir is known to comprise about 50% of all standing timber in the western forests. The variety in the Rockys has slightly smaller cones and is a bluer color than the Douglass firs in the Northwest.

Rocky Mountain juniper: (*Juniperus Scopulorum*) is also called Mountain Red Cedar and Weeping juniper. This tree ranges from B.C. and the Rockies of Alberta to the southern American Rockies, into the mountains of western Texas, and over to south-central Arizona. It is also present in the mountains of eastern and central Washington, eastern Oregon, and most of the mountains of Utah and eastern Nevada. It can be found in the high plains and bluffs in eastern Montana and the western halves of the Dakotas and Nebraska. This tree is closely related to Eastern Red Cedar. It is a bushy tree, which typically grows 10-20 feet high. It produces a handsome, bright rose-colored wood, which is streaked with yellowish white. Its aroma is like that of cedar. This tree was not found on the property during the cruise but is in the immediate area.

Alligator juniper: (*Juniperus deppeana)* can also be called Checker bark juniper. Pinyon-Juniper woodlands make up more than one half of New Mexico's forested lands, and Alligator juniper represents approximately 7% of all trees within that area. The foliage of Alligator juniper is apparently somewhat more palatable than the foliage of most other junipers and, consequently, is more often utilized as browse. Alligator juniper is reported to be an important year-round mule deer food in parts of New Mexico. In Native American culture the cone-berries of alligator juniper were used in traditional foods, medicines, teas, and in ceremonial incense. The Zuni used alligator juniper cone-berries to flavor foods such as cornbread and blood sausage. They used the shredded bark to make torches. The Alligator juniper is noted for its prolific sprouting ability. This species is capable of sprouting from shallow roots, the root crown, or epicormic buds located along the branches or trunk. Research indicates that younger trees sprout more readily than older plants and that sprouting ability declines as stump diameters increases.

Gambel oak: (*Quercus gambelii*) is sometimes referred to as Scrub Oak, Rocky Mountain White Oak, or Mountain Oak. The tree typically grows at altitudes of 1,000–3,000 meters (3,300–9,800 ft.) above sea level. It flourishes in full sun on hillsides with thin, rocky, alkaline soil where competition from other plant species is limited. It also does well in richer soils, but in those areas, it is forced to compete for growing room. It is well-adapted to locations where wet springs and hot, dry summers create conditions conducive to wildfires. After a fire, Gambel oak quickly re-establishes itself from root spouts. The plant is also quite drought tolerant. This is a very slow-growing small oak, which is the most common deciduous Oak of the Rocky Mountains. Scrub oak may provide forage for many different animals. Livestock and wildlife both like its sweet foliage. Gambel oak commonly hybridizes with other oak species (Harvard, Gray, Mohr, Chinkapin, Turbinella, Arizona), producing a hybrid called Wavyleaf.

Mountain mahogany: (*Cerocarpus montanus*) is important to deer populations in New Mexico. Mountain Mahogany is a very common shrub at altitudes from 5,000-8,000 feet. Numerous light gray stems rise to 9 feet from a densely packed base and then lean outward giving a 4 to 8-foot crown spread. In good years Mountain Mahogany puts on a beautiful display of tiny red and yellow trumpet flowers. These develop into seeds with feathery tails that loft the seeds on the winds of late summer and fall.

Bigtooth Maple (*Acer grandidentatum*) commonly called bigtooth maple, is a species of maple native to interior western North America. It occurs in scattered populations from western Montana to central Texas in the United States and south to Coahuila in northern Mexico. Description It is a small to medium-sized deciduous tree growing to 10–15 meters (33–49 feet) tall and a trunk of 20–35 centimeters (8–14 inches) diameter. The bark is dark brown to gray, with narrow fissures and flat ridges creating plate-like scales; it is thin and easily damaged. The leaves are opposite, simple, 6–12 cm (2+1⁄4–4+3⁄4 in) long and broad, with three to five deep, bluntly-pointed lobes, three of the lobes large and two small ones (not always present) at the leaf base; the three major lobes each have 3–5 small subsidiary lobules. The leaves turn golden yellow to red in autumn.

Cottonwood: (***Spp***). Species of cottonwood are present on the site. Below is a description of general cottonwood species. They frequently hybridize so it is most appropriate to simply describe the genus.

This is the cottonwood of desert waterholes and watercourses. A deciduous poplar of the Willow family with broad, flattened, open crown of large, widely spreading branches & trunk diameter of 2 to 5 feet. Easily propagated from cuttings, it is extensively planted in its range along irrigation ditches. Although it is a fast-growing shade tree, it is short-lived.

Bark: The heartwood of this tree is deeper brown than that of Fremont cottonwood, but the sapwood is white. On older trees, the bark is thick, deeply furrowed, reddish brown. On branches or on young trees, bark is thin, smooth, gray, brown.

Leaves: Roughly triangular in shape, 2 to 2.5 inches long and 2.5 to 3 inches wide. They are shiny green with a thin yellow midrib, a coarsely toothed margin & a yellow, flattened stem that causes the leaf to shake back & forth in the wind. Leaves turn bright yellow in autumn.

Stands Summary

The variable cruise data showed an average basal area average of 62 square feet/acre with an average mean diameter of 9 inches for all species present. Note: The quadradic mean diameter is used so that tree size data will not be skewed and a few trees, large or small, will not have significant on the averages) The basal area distribution was mostly within the Douglass Fir and Ponderosa Pine types. In the recommendations the goals for specific projects will help determine the size class and species ratio to retain for each area. **Appendix C** shows in-depth information from the variable plot cruise and appendix E shows field notes from the timber cruise.

Foresters utilize a quick key to label trees based on their first two letters of the first two words in their scientific names, in this case there was (***PS****udoTsuga* ***ME***nziesii PSME Douglass Fir, or ***PI****nus* ***PO****nderosa* and Pipo). The cruise on the Turpen property indicated most of the Basal Area resides in the 11+" size class per acre (41.1 BA / ac); the greatest number of Trees per acre (TPA) are within the sapling size class (1 – 2.99-inch trees) with just under 58 trees per acre. It is important to note here sawtimber merchantability standards are above a 9-inch DBH with at least an 8-foot log. The above narrative and the variable plot data conflicts with the standard as 9-10.9-inch trees but are considered pole timber for the purpose of this plan.

Forest Protection

Fire

Much of the data collected on the property was stand density (see timber section). While overall fuel loading for the site is important to fire behavior the tree density in this case will be an overarching factor as to fire on the landscape. As a rule, the tree densities over 50 Square feet per acre have ever increasing hazard potential and torching (individual or small pockets of trees igniting during a fire) or Crowning (All trees in a stand carrying the fire). Also, as a rule of thumb (varies by specific instance) a tree density of 40-60 Square feet per acre in Mixed conifer forest is optimal for individual tree growth and overall stand

productivity, while also optimal for reducing fire risk. Densities higher than this may allow for more growth at the risk of increasing harm from crown fire.

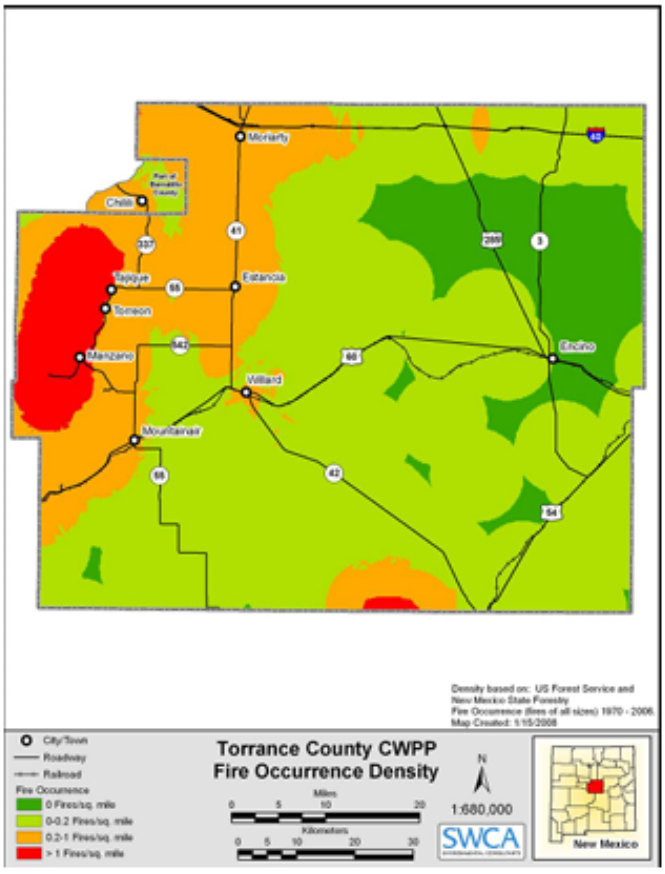
Fire hazard in the urban interface is generally assessed by combining the effects of; 1) Fuels, their continuity and arrangement, 2) Topography, steepness of slope and direction of aspect, 3) The presence of structures and their construction, and to some extent, 4) The proximity of suppression resources (Fire Departments, water sources). Fuel arrangements are poor on the property. All the thinning projects that have been completed should be maintained for the life of this plan. The landowner should make sure there are multiple alternate routes off the property to ensure the best safety for people on the property. This route could be as simple as pre-planned emergency route to another road.

Fire hazard on the property relates directly to the density of trees within the 40 acres; the stand is dense and overgrown in a singular manner. However, most trees on the property are one seed juniper with occasional Pinyon pine and Alligator Juniper, trees that are typically associated as ladder fuels. While the spacing and density of woody material on the property are large contributors to fire hazard, there are no large story trees for a fire to grow into. North and east adjacent properties are largely grass and categorized as one-hour fuels while south and west consist of forested land.

Fire risk addresses the potential ignition sources for the area. (Map 4) *Fire Locations* shows a history of fire in the area as recorded by the U.S. Forest Service and New Mexico State Forestry. Ignitions may be both human and naturally caused. Human ignitions may be from neighbors, prescribed burning, travelers on adjacent roads and other unforeseen, man-caused accidents. Lightning would be a natural ignition. The history of the area suggests that human caused ignition would put the property at a greater risk.

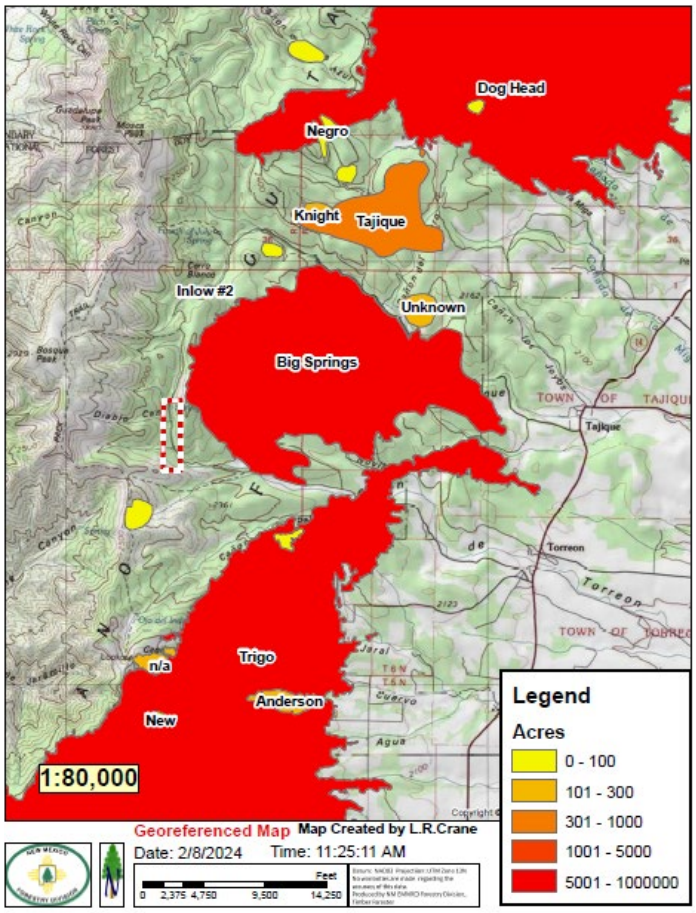
Map 4: Recent Fire Occurrence Density (From 2008 CWPP)

Map 5: Recent Fire Occurrence Adjacent to the Property (Up to date 2024)



Map 9. Torrance County fire occurrence density.

Map 4



Map 5

A Community Wildfire Protection Plan (CWPP) is a plan developed by a community in an area at-risk from wildland fire. The CWPP is a collaborative product involving interested parties, local government, local firefighting agencies, and the state agency which oversees forest management and, if present in the vicinity, federal land management agencies. A valid CWPP has two objectives; first, to identify and prioritize the surrounding area, both federal and nonfederal lands, for hazardous fuels reduction treatments, as well as recommending methods for achieving hazardous fuels reductions. Second, the plan recommends measures for reducing structural ignitability throughout the at-risk community. The first statutory definition of CWPPs appears in Title I of the Healthy Forest Restoration Act of 2003 (HFRA). The HRFA promulgates that communities, which have a CWPP in place, will be a priority for receiving hazardous fuels reduction funding administrated by the USFS and BLM. Community Wildfire Protection Plans may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection—or all these issue. The process of developing a CWPP can help a community clarify and refine its priorities for the

protection of life, property, and critical infrastructure in the wildland–urban interface. It also can lead community members through valuable discussions regarding management options and implications for the surrounding watershed. The minimum requirements for a CWPP as described in the HFRA are: (1) Collaboration: A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties. (2) Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure. (3) Treatment of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan. To obtain formal recognition, a CWPP goes through an approval process in which New Mexico State Forestry, Claunch-Pinto Soil and Water Conservation District, Torrance County manager, Torrance County Fire Department and the Forest Service Mountainair Ranger District agree to, and sign off on, the final contents of the CWPP. The CWPP is developed through a public comment and review period as well.

The Torrance County Community Wildfire Protection Plan (CWPP) classified the property as high to extreme fire risk[3]. The CWPP was completed in 2008. The goals of the CWPP were to have a solid reaction to problems encountered during the Ojo Peak and Trigo fires, to reduce damage to Community Values at Risk and supply solutions to the problems. This CWPP should not be used to evaluate individual home conditions and risk. NFPA form 1144 (Wildfire Risk and Hazard Severity Form) to determine risk to homes in the areas. (Table Below) *Table from the Torrance County area CWPP* below, could be used to assess the individual homes risk based on the factors used in assessment form and current conditions on the property. The CWPP is used to identify Communities at Risk (CAR) for future planning purposes for the county and other local entities. CARs are updated as new CWPP's are completed and the 2008 version was used here. The CWPP can be a good tool to develop general plans on an individual property, but actual site data should be used to develop detailed plans. The CWPP must use general inputs for any area and cannot get specific enough to address individual ownerships of land.

[3] Information derived from The Torrance County Area CWPP available at http://www.emnrd.state.nm.us/SFD/FireMgt/documents/TorranceFinalCWPP2.pdf

Table 5: Data from Torrance County CWPP

Wildfire Hazard Severity Form Checklist **NFPA 299 / 1144**					
This form may be used for individual houses or larger areas like developments or other types of applications.					
Name of area or address receiving assessment					
A. Subdivision Design	Points	Risk	Reduction	Notes	
1. Ingress and egress (Main Road)					
Two or more roads in/out	0				
One road in/out	7				
2. Road width (Main Road)					
Greater than 24 feet	0				
Between 20 and 24 feet	2				
Less than 20 feet wide	4				
3. All-season Road condition (Main Road)					
Surfaced, grade < 5%	0				
Surfaced, grade > 5%	2				
Non-surfaced, grade < 5%	2				
Non-surfaced, grade > 5%	5				
Other than all-season	7				
4. Fire service access (Driveway)					
< = 300ft, with turnaround	0				
> = 300ft, with turnaround	2				
< = 300ft, no turnaround	4				
> = 300ft, no turnaround	5				
5. Street signs (Main Road, i.e., address, dead-end)					
Present (4 in. in size and reflectorized)	0				
Not present	5				
B. Vegetation (Fuel Models, 300' and beyond)					
1. Predominant vegetation					
Light (grasses, forbs)	5				
Medium (light brush and small trees)	10				
Heavy (dense brush, timber, and hardwoods)	20				
Slash (timber harvest residue)	25				
2. Defensible space (0 to 300')					
More than 100 ft of treatment from buildings	1				
More than 71 -100 ft of treatment from buildings	3				
30-70 ft of treatment from buildings	10				
Less than 30 feet	25				
C. Topography					
1. Slope					
Less than 9%	1				
Between 10-20%	4				
Between 21-30%	7				
Between 31-40%	8				
Greater than 41%	10				
Totals for this page		0	0		
D. Additional Rating Factors	Points	Risk	Reduction	Notes	
1. Topography that adversely affects wildland fire behavior	0 - 5				
2. Area with history of higher fire occurrence	0 - 5				
3. Areas of unusually severe fire weather and winds	0 - 5				
4. Separation of adjacent structures	0 - 5				
E. Roofing Materials					
1. Construction material					
Class A roof (metal, tile)	0				
Class B roof (composite)	3				
Class C roof (wood shingle)	15				
Non-rated	25				

F. Existing Building Construction					
1. Materials (predominant)					
Noncombustible siding/ deck	0				
Noncombustible siding/ wood deck	5				
Combustible siding and deck	10				
2. Setback from slopes > 30%					
More than 30 feet to slope	1				
Less than 30 feet to slope	5				
Not applicable	0				
G. Available Fire Protection					
1. Water source availability (on site)					
500 gpm pressurized hydrants < 1000ft apart	0				
250 gpm pressurized hydrants < 1000ft apart	1				
More than 250 gpm non-pressurized, 2 hours	3				
Less than 250 gpm non-pressurized, 2 hours	5				
No hydrants available	10				
2. Organized response resources					
Station within 5 miles of structure	1				
Station greater than 5 miles	3				
3. Fixed fire protection (interior, some exception to outside)					
Sprinkler system (NFPA 13, 13R, 13D)	0				
None	5				
H. Utilities (Gas and Electric)					
1. Placement					
All underground utilities	0				
One underground, one aboveground	3				
All aboveground	5				
Totals for this page		0	0		
I. Totals for Risk Assessments					
Totals for page 1 and 2		0	0		
1. Low Hazard: < 39 points					
2. Moderate Hazard: 40-69 points					
3. High Hazard: 70-112 points					
4. Extreme Hazard: 113 > points					
Census Data					
Track number					
Block group number					
Block number (s)					

The CWPP is used to show how fire risk is calculated for areas so an individual landowner can understand how a county determines where priorities of activities will be placed. The CWPP is used to determine where any funding should be spent based on the higher risk factors for any given area. The Torrance County fire department will work with landowners on many deferent issues related to making a home defendable, fire prevention and all other issues associated with having a home in the Wildland Urban Interface. Since there are no fire hydrants in the immediate area all water to fight a structure fire would have to be hauled in. Fire departments response can be 15 to 30 minutes depending on the time of year. Defensible space is defined as an area around a structure in which fuels and vegetation are treated, cleared, or reduced to slow the spread of wildfire towards the structure and/or lower its intensity. Recommendations will cover defensible space more clearly around the home on the property. The CWPP goes on to provide information on the rate of spread for a fire, flame lengths, fire intensity and fire occurrence based on several types of fire modeling. All these factors are important in addressing fire protection on the property. Predicted rate of spread and flame length are directly related to the time you will have to evacuate in case of a wildfire. The longer the

flame length and the higher the rate of spread the less time you will have to evacuate. Fire intensity is directly related to what will be left in the event of a catastrophic wildfire and will directly reflect recovery of the property from the fire.

A Browns transect was not done to estimate the total tons per acre of fuel present on the ground. Fuel loadings can be helpful to predict fire spread and intensity. The overall average of 1.87 tons per acre is average for the area and forest type[4]. Fuel loading should be addressed in any forest stand improvement project and activities should result in minimal increase in fuel loadings. Fuel loading has four classifications based on size and how long they burn: 1 hour, 10-hour, 100 hour and 1000 hour. The 1-Hour Moisture (1-hr FM) represents the modeled moisture content in dead fuels comprised of herbaceous plants or woody plants less than about 1/4 inch in diameter and the surface layer of litter on the forest floor. The 10-Hour Moisture (10-hr FM) represents the modeled moisture content in dead fuels consisting of roundwood 1/4 to l-inch (0.6 to 2.5 cm) in diameter and, very roughly, the layer of litter extending from immediately below the surface to 3/4 inch (1.9 cm) below the surface. 100-Hour Fuel Moisture (100-hr FM) represents the modeled moisture content of dead fuels in the 1-to-3-inch diameter class. It can also be used as a very rough estimate of the average moisture content of the forest floor from three-fourths of an inch to four inches below the surface. The 100-hr FM value is computed using length of day, maximum and minimum temperature, relative humidity, and precipitation duration in the previous 24 hours. 1000-Hour Fuel Moisture (1000-hr FM) represents the modeled moisture content in dead fuels in the 3-to-8-inch diameter class and the layer of the forest floor about 4 inches below the surface. The 1000-hr FM value is based on a running 7-day computed average using length of day, daily temperature and relative humidity extremes and the 24-hour precipitation duration values.

Post-Fire Flood Risk

The U.S. Geological Survey produced a report in 2014 that assessed the potential for post-fire flooding throughout the Sandia and Manzano Mountains http://pubs.usgs.gov/sir/2014/5161/pdf/sir2014-5161.pdf.

Many of the communities in the Torreon area have a high probability of debris flow after a fire, due to the combined effects of forest condition and topography. Most of the forest and topography conditions exist on State, County and Federal land. The impact of post-fire flooding can be greater than that of wildfire alone in terms of geographic extent and number of people affected. Post fire flooding is a real concern and can affect streams, lakes, ponds, culverts, bridges under roads as well as homes. You may not be in a flood zone prior to a fire but most likely will be after a fire. Post-fire floods in the Southwest have been dramatic when you look at communities and businesses downstream from the Las Conchas Fire and the White-Water Baldy fire. Mitigating flood and debris flow impacts often involves a substantial amount of work that can take weeks when there can be only days before a monsoon hits. Funding and implementing mitigation activities on private land can be difficult when your 100 acres are down stream of thousands of acres of needing treatment owned by other entities. What work that could be done will be all but wiped out if the work upstream is not completed. Landowners need to investigate insurance issues concerning post fire flooding by asking their provider specific questions about how or if your home is covered for flooding after a fire. One good question to address is if you can purchase flood insurance right after a fire in your area. To find out more about flood insurance, go to www.floodsmart.gov. To help plan for wildfire and cope with its

[4] Information from the Designing Fuels Management Approaches for Southwestern Piñon - juniper Woodlands available at http://www.forestguild.org/SWconsortium/SWfuels/Huffman_DesigningFuelsManagement.pdf

aftermath, New Mexico has a useful online guide. The guide is available at http://www.afterwildfirenm.org/.

Roles of cooperating agencies for Law Enforcement and Fire response

As a result of recent questions arising from the redevelopment of other properties in the district, this section was added to better define the roles of agencies and other organizations that have jurisdictional responsibilities or can contribute in other meaningful ways to the management of and assistance to the property. Jurisdiction for the case of this plan will refer to a government agency that has a duty to initiate a response. (Map 5) *Landownership of surrounding area* identifies the different ownership whether it is federal or private. Below is a list of these cooperators and their duties and responsibilities as it relates to fire and wood theft. In the event of a fire on the property dialing "911" is always the best place to start.

Fire Response

The location of the property is the primary wildland fire response area as CIF which is the Initial Attack (IA) area of US Forest Service Cibola National Forest, Mountainair Ranger District and Torrance County.

Torrance County Fire Department

This is the primary responding agency for all 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 Torrance County Fire Department. 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 Torrance County is a fully functional and very active participant in this program.

US Forest Service Cibola National Forest Mountainair Ranger District (Federal)

The local unit of the US Forest Service Cibola National Forest Mountainair Ranger District is the closest Federal wildland agency to this property. This organization's equipment would probably be first on scene for an incident in the area. In the event of a wildfire, it is highly likely a request for the district's resources will be initiated and paid for by NM State Forestry.

Bureau of Land Management Rio Puerco Field Office (Federal)

The local unit of the Bureau of Land Management Rio Puerco Field Office is a federal wildland agency that is responsible for fire suppression on Bureau of Land Management property. A request for the district's resources could be initiated since most of their equipment is based out of Albuquerque unless they are on patrol in another area.

Torrance County Sheriff's Office

Torrance County Sheriff's office will be the first law enforcement agency to respond to any criminal complaints on the property. This office has authority to site firewood haulers if they do not have the proper permit. State law requires a permit for the removal of any wood products from land in New Mexico. A portion of the section of the law specifically states; "NMSA 1978, Sections 68-2-22. Cutting and removing woody material without written consent. No person shall cut, remove, transport, or sell any woody material without written consent of the owner or proof of ownership, whether the land is publicly or privately owned. The written consent shall contain a legal description of the land where the woody material is removed, the name and address of the legal owner, the volume or amount of material to be removed, the date of execution and the expiration date of the consent. In addition, any person purchasing woody material from another for the purpose of resale must possess a valid bill of sale containing the date of sale, the amount of material purchased and the name, address, and signature of the seller..." Below is a typical firewood permit and the information needed. It is recommended that the permit be an original signed in blue ink and have a specific period of time. No open-ended permits should be issued as these are easily copied and used for wood theft.

WRITTEN CONSENT FOR SALE OF WOODY MATERIAL

SELLER **PURCHASER**
(LEGAL OWNER)

_____ NAME_____

_____ADDRESS_____

_____ CITY_____

_____STATE_____

_____PHONE_____

The party named above has permission to transport the following woody product or products from the property mentioned above.

PRODUCTS	SPECIES	QUANTITY (CORD)

This / these product(s) can only be removed from the following location:
Township_____, Range_____, Section(s) _____ further described as:

_____
(Geographical description if applicable)

This written consent shall begin on: _____.
(Month / day / year)

The consent to remove the above-described material will expire on: _____.
(Month / day / year)

_____	_____	_____
(Seller Signature)	**Date**	**(Buyers Signature)**

Seller and the Purchaser should be aware of the following state statue governing the removal and sale of all woody products.

68-2-22: Cutting and removing woody material without written consent: No person shall cut, remove, transport, or sell woody material without the written consent of the owner or proof of ownership, whether the land is publicly or privately owned. The written consent shall contain a legal description of the land where the woody material is removed, the name and address of the legal owner, the volume or amount of material to be removed, the date of execution and the expiration date of the consent. In the addition any person purchasing woody material from another for the purpose of resale must possess a valid bill of sale containing the date of sale, the amount of material purchased and the name, address, and signature of seller. The written consent, bill of sale, or a true copy shall be carried by every person in charge of cutting, removing, transporting, or selling the woody material and shall be exhibited to any officer of the law, forestry agent, forest ranger, forest patrolman or conservation officer at his request at any time. This provision shall not apply to campers, picnickers, hunters, and fisherman who gather woody material in the immediate vicinity of their camp site, or private landowners removing woody material from their own land for their personal use.

Forest Health

Bark beetles: (*Ips* spp. or *Dendroctonus* spp.) Ips beetles, also called engraver beetles, attack Ponderosa and Piñon pines as well as other conifers. Dendroctonus beetles, although small, attack medium to large Ponderosa pine, Blue spruce, Engelmann spruce, and Douglas fir trees. Each species creates distinct egg galleries that are distinct to the species. These galleries eventually girdle the tree. A tree's natural defense is to "pitch out" or excrete sap into the entrance hole to cover the beetle with this sap, thus killing the invader. Trees are most likely to be successful at this when they are not stressed due to high stand densities and have more sunlight and water available to them.

Adult Piñon ips feeding colonies are frequently found near the base of Piñon during the fall through early spring.

Pitch tubes caused by Piñon ips attacks.

Juniper Borers: (*Callidium* spp) Several Roundheaded and Flatheaded woodborers are aggressive pests in drought-stressed Junipers in New Mexico. Damage can be extensive before symptoms are apparent. Usually, a large portion of the tree or the entire tree dies before the insects exit holes are noticed. Larvae bore beneath the bark making very wide, wavy tracks that distinctively score the outer sapwood much like a router. Older larvae excavate oval tunnels deep in the wood and overwinter. Adults can emerge throughout the warmer months of the year. There is one generation per year. Adult beetles are rather short horned for cerambycids and dark blue or black. *Atimia* spp. are small Roundheaded borers about 6.5 mm long and generally have a 1-year life cycle. These long-horned beetles attack the thin barked portions of seriously weakened and dead Junipers. *Trachykele blondeli*, the western cedar borer, is 11 to 17 mm long and attacks Juniper and Arizona cypress. Females lay eggs under bark scales on the branches of living trees. *Chrysobothris* spp. are flatheaded borers of Junipers and Arizona cypress. They are medium-sized beetles about 11.5 mm long. Larvae bore into the bark and outer wood of weakened trees. The Juniper twig pruner, *Styloxus bicolor*, is a small Roundheaded borer that mines the small branches and causes twig dieback during dry periods.

Larval feeding galleries of the western cedar borer.

Juniper damage caused by western cedar borer.

Larva of flatheaded wood borer. Note that their flattened heads are usually broader than the body.

Adult metallic wood borer (flatheaded wood borer). Note that antennae are shorter than the body.

Forest Disease

Forest diseases may affect the health of plants in the forest. Diseases include parasitic plants, fungi, and bacteria. Forest diseases may degrade 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.

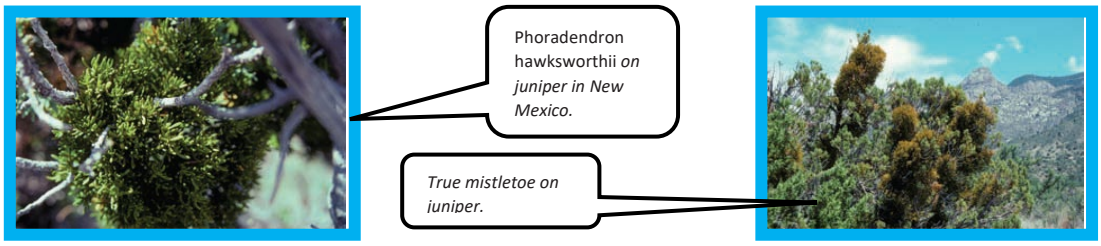
Dwarf Mistletoe: Piñon is (Arceuthobium divaricatum Engelmann) and Ponderosa pine is (Arceuthobium vaginatum subsp. cryptopodum (Engelmann)). This is the most common forest disease found in forest systems in this area. Mistletoes are parasitic plants that may kill their hosts over time. Essential water 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 species of dwarf mistletoe 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 over story. Trees should not be thinned in mistletoe infected areas as this would serve to increase the spread of the disease.

Female Piñon dwarf mistletoe with mature fruit.

True mistletoe on juniper.

True mistletoes: This species is commonly known as the Christmas or leafy mistletoes. There are eight species in the Southwest, all within the genus Phoradendron. Three of the species can be found in: Oak Species (Phoradendron coryae Trel.), in Utah and Alligator juniper (Phoradendron capitellatum Torr. ex Tel.) and Alligator and One-Seed juniper (Phoradendron hawksworthii Wiens & CG Shaw). True mistletoes are flowering plants with thick green stems. Plants are often round in form and up to 1 meter in diameter, depending on the species. Hardwood true mistletoes have thick green leaves that are nearly oval, contrasting with conifer true mistletoes, which have small thin leaves or are nearly leafless. Fruit-eating

birds distribute the seeds in their droppings or by wiping their beaks. Some bird species swallow the fruit whole and disperse the seeds to another tree, while other bird species pick out the seed, leaving it on the host plant, and swallow only the pulp. When the seeds germinate a modified root penetrates the bark of the host and forms a connection through which water and nutrients pass from the host to the mistletoe. It takes approximately 2 to 3 years for shoots to develop, following initial infection, and another year before the plant is producing berries. Young or small trees are seldom infected by true mistletoe. In nearly all cases, initial infection occurs on larger or older trees because birds prefer to perch in the tops of taller trees. True mistletoes are not aggressive pathogens. They use the host xylem as a water source and do not cause mortality until water availability to the host is limited. In some hosts, infected portions of the tree often exhibit galls on branches or burls in the trunk. Pruning can be somewhat effective.

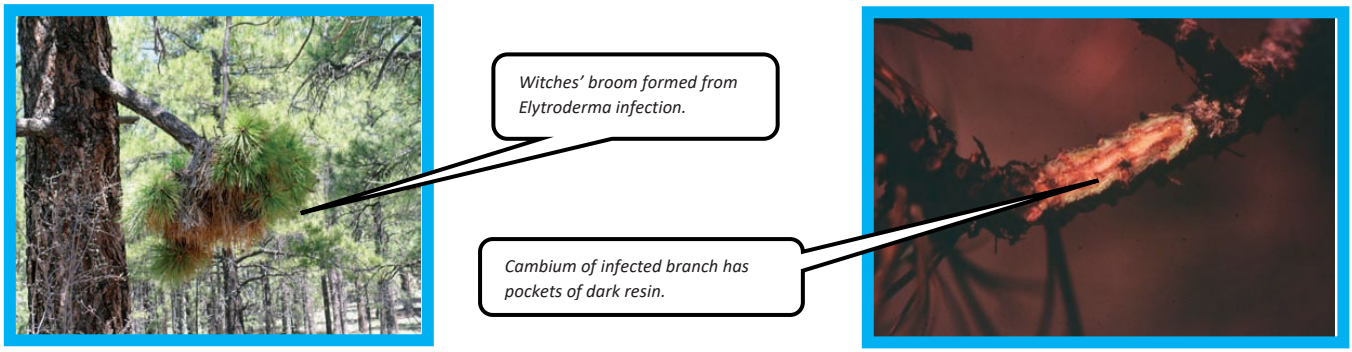


Broom Rusts**:** There are two main types of broom rusts found in this area. These are Spruce broom rust that attacks Engelmann spruce and Blue spruce; and fir broom rust that attacks white fir and sub alpine fir. Rusts causes growth loss, top – kill, and occasionally tree mortality. Infections found on the main stem of trees may also make trees more susceptible to decay. Rusts require alternate hosts to complete their life cycles and spread. Kinnikinnick is the alternate host for Spruce rust and chickweed is the alternate for fir broom rust. Infected branches may be pruned to help control the infections. There are no chemical or biological controls.

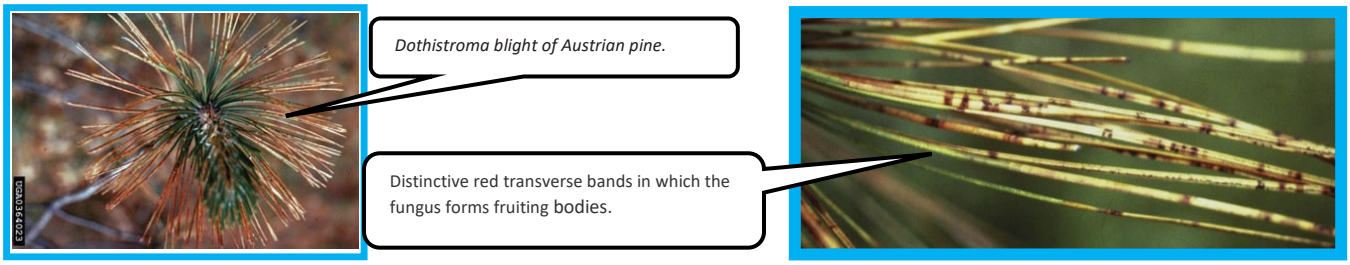
White Pine Blister Rust**:** This is not known to exist in the area but should be addressed. White pine blister rust is primarily found on the Southwestern White pines in the southern portion of the state. This is a disease that has the potential to spread to limber Pine located in the area. Some experts see Southwestern White pine and Limber pine as different varieties of the same species. Blister rust causes cankers in the tree that eventually girdles and kills the tree. The alternate host is Ribes plants that are necessary to complete its lifecycle.

Needle Cast**:** Elytroderma deformans: Elytroderma (*Elytroderma deformans* (Weir) Darker) needle cast affects Piñon and Ponderosa pine in New Mexico. It can be damaging because it invades twigs and branches and persists for several years. Needles begin to fade in the fall of the year of infection, and by late winter are lighter in color than uninfected needles. By spring, the infected needles turn straw color as the new needles break bud. The fruiting bodies are elongated (average 10 mm in length) and black when visible on dead needles. Distinctive “witches’ brooms” are formed by the sprouting of epicormic buds. Resin cysts can be found in infected twigs. Spores initially infect new needles through the epidermis following bud break, but infection can continue into the fall until temperatures are too low for spore germination and growth. There are two types of spores: one spore is spread by water and the other is spread by wind. When twigs become infected, the fungus can perennially infect needles on the same twigs. Conditions conducive to needle infection by spores only must occur once, after which the disease can progress within the infected tree. In mature trees, if less than one-fourth of the branches are infected there is little or no effect on the

tree, but if more branches are infected, needle cast alone can kill a tree or predispose it to attack by bark beetles.



Red Band Needle Blight: Blight (Mycosphaerella pini Rostr. in Munk (Scirrhia pini Funk & A.K. Parker)) and (Dothistroma septospora (Doroguine) Morelet (D. pini Hulbary)) symptoms first appear as yellow or tan bands around the needles, which later turn red. Infection of current and second year needles is usually in the lower crown of sapling size trees. Seedlings and large trees are rarely infected. Newly infected needles have green bands that turn red or brown in late summer. These needles die from the tips back. Infected second and older year needles can be cast the same year they become infected. Needles are infected during rainy periods by rain-splashed spores. The number of infection cycles depends on the climate. During wet years, several cycles of infection can occur. Blight is most often associated with offsite planting. Several years of severe infection results in reduced growth and death of infected trees.



Noxious Weeds

There are four classes of noxious weeds, class A, B, C and Watch List weeds. As defined by the NMSU cooperative extension services publication New Mexico's Invasive Weeds:

Class A weed species are currently not present in New Mexico or have limited distribution. Preventing new infestations of these species and eradicating existing infestations is the highest priority.

Class B weed Species are limited to portions of the state. In areas with severe infestations, management should be designed to contain the infestation and stop any further spread.

Class C weed species are widespread in the state. Management decisions for these species should be determined at the local level, based on feasibility of control and level of infestation.

Watch List species are species of concern in the state. These species have the potential to become problematic. More data is needed to determine if these species should be listed. When these species are encountered, please document their location, and contact appropriate authorities. (Table 6) *Noxious weeds in Torrance County* according to the New Mexico State University weeds web page is a list of 13 noxious weeds with Torrance County. A complete list can be found in **Appendix F.**

Table 6: Noxious weeds in Torrance County:

According to the New Mexico State University weeds web page (http://weeds.nmsu.edu/databasesearch.php) or http://www.nmda.nmsu.edu/wp-content/uploads/2012/04/troublesome_weeds_nm.pdf.

Class A	Class B	Class C	Watch List Species
Scotch thistle *(Onopordum acanthium)*	Musk thistle *(Carduus nutans)*	Jointed goatgrass *(Aegilops cylindrica)*	
Dalmatian toadflax *(Linaria* dalmatica*)*	perennial pepperweed *(*Lepidium latifolium)	Russian olive *(Elaeagnus angustifolia)*	
Field bindweed *(Convolvulus arvensis)*	Russian knapweed *(Acroptilon repens)*	Saltcedar *(Tamarix spp.)*	
Hoary cress *(Cardaria spp.)*		Siberian elm *(Ulmus pumila)*	
Canada thistle *(Cirsium arvense)*			
Yellow toadflax *(Linaria vulgaris)*			

Cultural Resources

No Cultural resources have been identified in the immediate area according to the New Mexico Historic Preservation Division at this address https://nmcris.dca.state.nm.us/nmcrist/Security/SignIn.aspx. Care should be used if potential historic or cultural sites are found, and the New Mexico Historic Preservation Division should be notified. An Acequia is located on the property and should be preserved. Additional historical information could not be found at the time of the writing of this plan. This was identified during the previous management activity and protected.

Recommendations

Based on the Landowner Goals and Objectives (Listed Again Below) the following recommendations are encouraged to best manage the property.

Landowner goals and objectives

Goal 1: Develop a comprehensive property map showing existing roads, existing thinning, future management areas. This goal will become the "existing condition" within the Stewardship Plan and provide a planning baseline for future forest management and treatment objectives.

- **Objective 1.1** - identify future management areas that can be accessed by roads. Identify potential benefits or negative impacts.

1. The property has excellent access by road as a result of the two roads (FR 55 and the internal property road). Areas can be reasonably accessed to perform forest treatments. The basic forest maps in the plan could be further developed to include a working map and used to isolate specific Forest Treatments during projects. An "Avenza Map" will be provided as a base layer to use during these forest treatments. It is recommended that each project use a new base layer to track progress, then combine the data into a larger map to track overall projects. The size and shape of the property allows for the minimal development and maintenance of roads. Some temporary trails (skid trails and very limited temporary roads) should be used for project specific facilitation.

- **Objective 1.2** - sample existing thinning and develop a multiple year management plan. Walker Place Forest Stewardship Plan

In 2012 the previous owners performed a forest treatment in the form of a small Timber Sale. This activity effectively provided some thinning in the 10 inch and above size class. By the end of the project the state Best Management practices were all satisfied, and the sale was successful. Any treatments moving forward considers this previous treatment in the design.

- **Objective 1.3** - Review existing roads; recommend best management practices and maintenance procedures to limit actual or potential erosion.

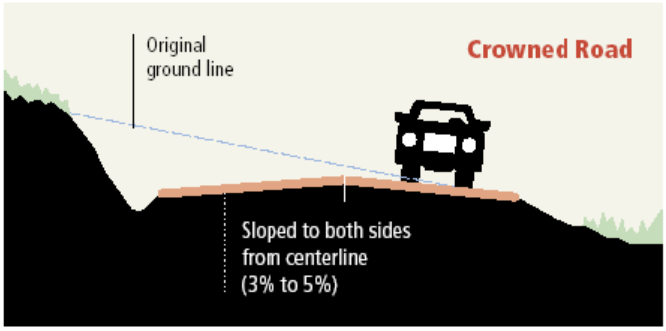
The existing road system is adequate to perform the identified forestry activities. The Forest Service system road is a right of way and is subject to the USFS maintenance. This does not occur on a dependable regular basis, however. Practices such as Log Hauling will pose significant administrative barriers due to USFS regulations.

The interior property road is in good condition. This will further benefit by employing road system Best Management Practices (BMPs). Below are a few of the road BMPs recommended by the New Mexico Forestry Division.

DRAINAGE PRACTICES

Crowned Road The center is built higher than the shoulders, allowing water to drain to both sides of the road. Effective on any grade of road when the road, ditches and drainage structures can be routinely maintained.

Outsloped Road Outsloping drains water uniformly across the road surface onto the fill slope. The road surface should be sloped outwards 2 to 4 percent or about 1/4 to 1/2 inch per
foot of width. No ditches are required for this method of drainage. Care should be taken to disperse water evenly over the fill slope. Cross drains should be added on outsloped roads before all stream crossings. Generally used on low use roads, for frequent maintenance may be required to prevent the road surface from becoming flat or insloped when a high use surface.



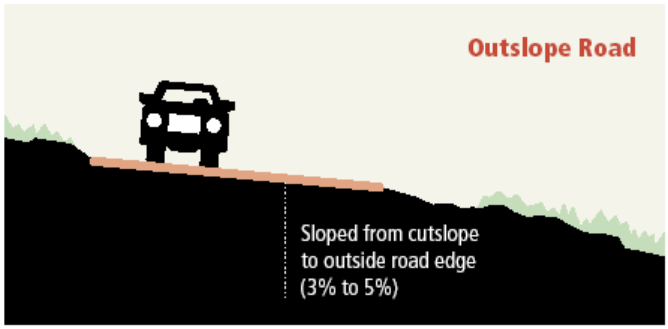


Table 7: Spacing for water bars and grade dips (4% Road Grade)

	North & East Aspect									South & West Aspect								
LOCATION OF ROAD	TOP 1/3 OF SLOPE			MIDDLE 1/3 OF SLOPE			BOTTOM 1/3 OF SLOPE			TOP 1/3 OF SLOPE			MIDDLE 1/3 OF SLOPE			BOTTOM 1/3 OF SLOPE		
PARENT MATERIAL*	C	M	F	C	M	F	C	M	F	C	M	F	C	M	F	C	M	F
STEEPNESS OF SIDESLOPE ABOVE ROAD (%)																		
80	145	121	95	127	103	77	109	85	59	129	105	79	111	87	61	93	69	43
70	140	116	90	122	98	72	104	80	54	124	100	74	106	82	56	88	64	38
60	135	111	85	117	93	67	99	75	49	119	95	69	105	77	51	83	59	33
50	130	106	80	112	88	62	94	70	44	114	90	64	96	72	46	78	54	28
40	125	101	75	107	83	57	89	65	39	109	85	59	91	67	41	73	49	23
30	120	96	70	102	78	52	84	60	34	104	80	54	86	62	36	68	44	18
20	115	95	65	97	73	47	79	55	29	99	75	49	81	57	31	63	39	13
10	110	86	60	92	68	42	74	50	24	94	70	44	76	52	26	58	34	8

- **Objective 1.4** Review existing perimeter control; recommend best management practices and maintenance to limit unwanted livestock and public access.

Natural public access to the property occurs due to the Forest Service System Road bisecting the property. Forest Road 55 runs along the eastern portion of the property. The slope to the east is very steep and the downslope on the property to the west acts as a barrier to access. The property is well

signed along this road as it enters and leaves the North and South. The gate and fencing to the lower bottomland to the property is an effective means to trespass prevention.

Goal 2 – Implement forest treatments and activities that improve habitat for key indicator wildlife species.

- **Objective 2.1** - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing wildlife habitat and browse.

Thinning activities will not only provide for increases fire mitigation but if performed with the wildlife objective also in mind it will serve to enhance habitat assets. Several practices that may be employed are the scattering of slash in areas where grass and forb growth should be encouraged. The slash can later be removed after the ground cover is established.

- **Objective 2.2** - where feasible, adjust thinning guidelines to the needs of a particular wildlife species.

For example, the management of the spacing of the timber to provide access to 20-foot-high horizontal branches will provide ideal Turkey roost sites. Focusing on habitat requirements for indicator species, such as Turkey, while performing the thinning will serve a dual purpose. If needed, specific areas for using wildlife practice may be discussed with a Natural resource manager when developing a project.

Wildlife habitat

Wildlife habitat is multifaceted and individually important to specific species. The area has significant signs of both elk and deer, albeit signs were older, no very fresh indications of ungulates was found. Tree thinning will open the habitat to all wildlife, making a more comfortable area for the turkey and deer to move freely, while it's important to facilitate free movement it is also to leave habitat, such as roosting trees and snags, as well as grass for grazing. After activities it is important to have good regeneration of food for species on the property, utilizing native grass seeds for replanting after activities can be a good method for attracting different species of animals in the adjacent areas. Landowner is encouraged to get a wildlife expert out to the property to give recommendations to improve wildlife habitat through improvements like drinkers, grass and forbs planting or other projects.

Turkey: Suitable habitat must include the three main components of water, roost sites, and summer/brood areas. However, winter and fall habitat can be locally important as well. In New Mexico, free water is essential for turkey survival since vegetation may not be able to meet moisture requirements. Roost sites are comprised of tall trees with layered, widely spaced, horizontal branches. These trees provide food, escape, and resting cover, as well as nighttime roosting. Turkeys prefer mesic (moderately moist) summer and brood habitat that is relatively open with a variety of grasses and forbs present. These provide a source of food in the form of seeds and insects for developing poults. During spring and summer wild turkeys feed mostly on herbaceous vegetation such as dropseed grasses (*Sporobolus spp.*), Muhlenbergia grasses, Panicum grasses, grama grasses (Bouteloua spp.), pine dropseed (*Blepharoneuron tricholepis*), nutsedge (*Cyperus spp*.), wild onions (*Allium spp.*), wild rye (*Elymus spp.*), wild oats (*Avena spp.*), dandelion (*Taraxacum officinale*), and beggarweed (*Desmodium purpureum*). However, insects are readily consumed by developing poults and by adults when available. If sources of mast (acorns, nuts, and fruit) are accessible, wild turkeys will also take advantage of this food source.[5]

Mule Deer: (picture taken from game camera on the property) Mule deer use piñon-juniper (PJ) habitats primarily for cover, although diversity and in some cases abundance of food can be similar in PJ as compared to other habitat types. Where present, PJ receives the greatest proportion of use by mule deer of any vegetation type and makes up more than 50% of female mule deer home ranges spread among differing structural classes of PJ. Management of PJ for mule deer is based on a "Rule of 4s." The "Rule of 4s" states that for each section of PJ, 1/4 should remain unmanaged and should have at least 60% PJ cover (if existing cover is < 60%, these areas should be allowed to develop to > 60% cover), 1/4 should be thinned to no less than 30% PJ cover, and the remaining 2/4 can be thinned to no less than 10 to 15% cover. Further, no unmanaged stand should be less than 40 ac. This will create a mosaic in which 1/4 of each home range will be in unmanaged PJ ideal for security cover, 1/4 will be in a structural state that provides both minimal cover requirements and increased forage (30% cover), and 2/4 will be in a structural state that provides scattered thermal cover and optimal foraging attributes (10–15% cover). This structural distribution was associated with the highest

[5] All material was taken from the New Mexico Wild Turkey Management Plan 2013-2018 at http://www.wildlife.state.nm.us/download/conservation/species/birds/management-recovery-plans/Turkey-Management-Plan.pdf

levels of condition obtained by mule deer in several studies. Regardless of habitat type, quality of typical winter range diets is inadequate to prevent catabolism and weight loss in mule deer. However, the rate of weight loss can be reduced by improving winter range forage conditions. In addition to sagebrush, important shrub species on winter range include serviceberry, bitterbrush, mountain mahogany, and cliffrose. Important forbs include buckwheat (*Eriogonum spp.*), fringed sage (*Artemisia frigida*), and phlox (Phlox spp.). Useful grasses include blue grama (*Bouteloua gracilis*), wheatgrass (*Agropyron spp., Pseudoroegneria spp.*), fescue (*Festuca spp.*), and bluegrass.[6]

Elk**:** (picture taken from game camera on the property) Elk habitat consists of a mosaic of woodland cover and large open areas. Woodland habitat provides escape cover from human disturbance and predators, and wooded corridors provide travel lanes among seasonal habitats. Open areas provide necessary herbaceous forage. Adequate winter habitat in the form of lowland woodland cover is crucial for elk survival. Elk prefer grass, but regularly feed on serviceberry, willow, buds of red osier dogwood, antelope bit-terbrush, snowberry, mountain mahogany, winterfat, aspen shoots, western juniper, sagebrush, and other shrub and browse species during winter months. Management decision should incorporate an increase in this forage. Densely wooded lowlands and north/northeast-facing slopes provide valuable hiding cover, and drier, open south/southwest-facing slopes can provide available forage. Controlled burning of pine stands within elk range can enhance the forage and protective value of the stands by promoting sucker shoots and new growth in the trees. Broadcast and under-burn burning techniques can reduce forest litter (downed trees, branches, and other woody vegetation) that could hinder elk movement through an area. However, maintaining woody material on the ground in calving areas should be considered in management involving prescribed burning. Selective tree harvest can open forest canopies and enable growth of understory forb and grass species important to elk as forage on winter range. Mast producing trees, such as oaks and dead trees containing nesting cavities (snags), should not be selectively cut as they provide important food and cover for many other species of wildlife. Seeding pasture and open areas with native grasses, forbs, and legumes can provide elk with winter and transitional range forage.

[6] All material was taken from the Habitat Guidelines for Mule Deer at http://www.wildlife.state.nm.us/download/conservation/habitat-handbook/project-guidelines/Habitat-Guidelines-for-Mule-Deer-Colorado-Plateau-Shrubland-and-Forest-Ecoregion.pdf

Black Bear: Forester understanding of bear habitat is minimal. Riparian areas are important to black bears. They provide valuable cover for travel and foraging as well as water for drinking, fishing, and play. On warm days you may be lucky and see bears wallowing in springs and creeks. In spring, the bear diet is mostly fresh grasses and forbs, young succulent shoots, roots, insects, and carrion. In summer, a bear likes young grasses, forbs, insects, berries, and fruit as a primary source of nourishment. Like humans, bears cannot convert cellulose into an absorbable form and so the mature plants and grasses of summer cannot be properly digested. Bears typically overturn rocks and stumps in search of larval insects, termites or ants, and may invade yellow-jacket nests. In late August, bears begin to forage on the foods that enable them to gain weight rapidly so that they can go through the denning period without eating. They eat a great deal of acorns, pinon nuts and juniper berries in the fall to store fat for the approaching winter. If necessary, they will feed on small rodents, maggots, and anthills. Females usually maintain a home range of five to seven square miles. Males on an average occupy an area of 25 square miles, although they can extend their territories to as much as 50 square miles if habitat quality deteriorates. Under ordinary conditions black bears tend to avoid each other rather than engaging in territorial aggression.

Additional Objectives

Enhance Turkey Habitat – Important Indicator Species

Turkey: Turkey are known to be frequent throughout the Manzano Mountains; typically found in the area are Meriam's Turkey, however, in riparian area there can be small pockets of Rio Grande Turkey in the area. Turkey need a few essential characteristics of the land to thrive properly: roosting areas, nesting areas, foraging opportunity, and water.

1. Roosting opportunities are important as this is where turkey will sleep at night. These birds can be migrant throughout the day but will start to seek tall trees and snags to roost away from predators as night falls. Currently there are not many opportunities on the property for turkey to roost. A good management practice in this case would be to thin out encroaching woodland species (pinyon juniper trees), maintain one to two snags per acre, and plant trees with more substantial height, ponderosa pine would be a good example. New Mexico State Forestry Seedling Program will have good recommendations based on landowner's location and needs.
2. Nesting areas are an important factor for turkey; during the springtime birds will start mating and hens will need a safe place to lay their eggs. New Mexico State Foresters have found leaving one to two piles about 12' x 12' size left loosely packed can be maintained as quality habitat for nesting turkeys. The property currently has a large amount of slash left on it, along with clearing some of this slash out would be a good opportunity to create habitat by leaving some piled.
3. Foraging opportunity can be an important factor when trying to attract larger populations of turkey. Primarily they prefer more open areas with tall trees, a moist environment, and plenty of grass and forbs. Some of the food Meriams turkey will seek out are Pinyon nuts, acorns,

berries, native grasses, insects, and fruits. In the winter when insects have gone dormant, they rely heavily on juniper berries and tall grasses.

4. Water requirements can be very important for turkey survival, it is outlined as a top three requirement under the New Mexico Wild Turkey Management Plan in the habitat section, full report can be found here (http://www.wildlife.state.nm.us/download/conservation/species/birds/management-recovery-plans/Turkey-Management-Plan.pdf)
   An additional article to read (http://www.wildlife.state.nm.us/download/publications/wildlife/Wild-Turkeys-of-New-Mexico.pdf) has good information on the life and cultural history of turkey in new Mexico, as well as information in regards to relocation of wild turkey throughout the state. Stocking programs were abandoned early, and the state has since done light relocation of turkey to help boost populations in low density areas.

   **Landowner Requested information on wild turkey relocation and habitat, an email was sent to the state biologist and the recommendations are as follow:

   - Selective thinning encourages large tree growth to promote roost sites.
   - Good grass cover in bottoms.
   - Maintain wet meadows.
   - Have a good mix of mast producing species (oak, pinyon, juniper)

   Additionally, New Mexico Department of Game and Fish Provided the parameters for Northern Goshawk habitat management, which falls very closely to turkey habitat requirements; this report is too large for the scope of this plan but can be found at NM State Forestry Bernalillo District. National Wild Turkey Federation was also contacted for additional resources; Scott Lerich, email: slerich@nwtf.net.
   Relocation in the Manzano is not currently a high priority as the population counts in the area are generally positive.

Other species to consider when performing projects:

Mule Deer: a species of important economic interest for the state as well as one of the most important game animals in New Mexico. There is little known about the population size and densities throughout the state. Like turkey there are important indicators to have present for mule deer populations. In the Manzano area primarily there will be Rocky Mountain Mule Deer (one of the two subspecies present in the state).

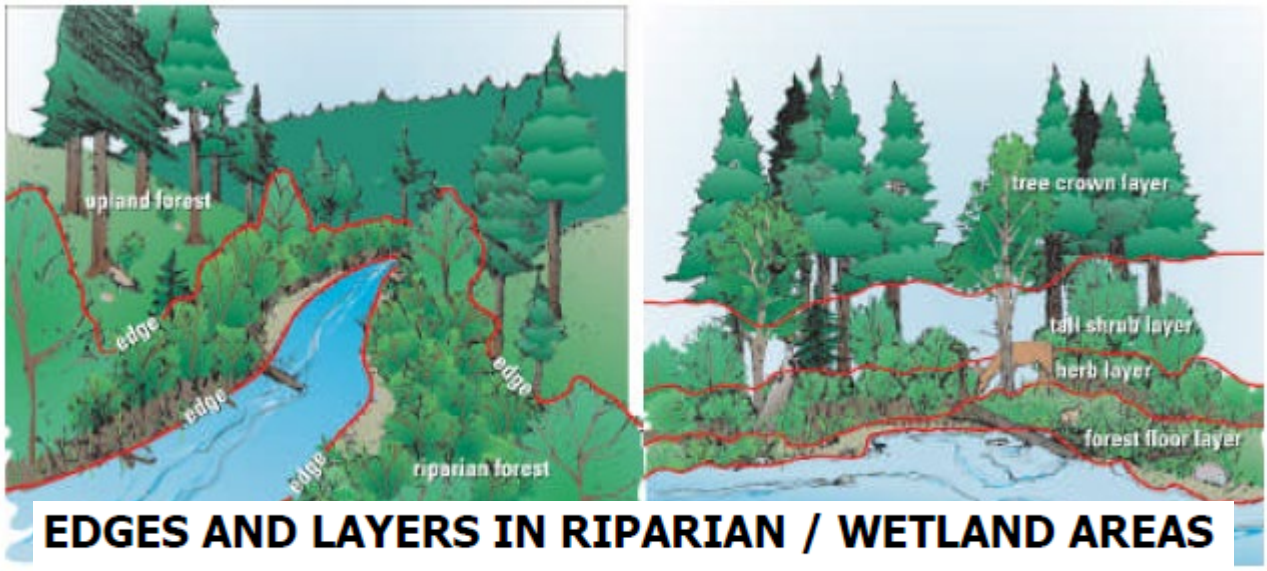
1. Mule deer spend a good amount of time in the morning and night feeding, having a good available source of grasses and shrubs can help attract mule deer onto the landowner's property. Considering the cost of native seed planting through the NRCS. In southern New Mexico mule deer have a history of seeking mountain mahogany, oaks, skunk bush, and yucca. Landowners have started planting these bushes and some were already present. Facilitating oak growth through disturbance and sunlight would be another good method to attracting deer.
2. Mule deer habitat requirements have two main needs: food and cover. The property has good woodland cover and is participating in increasing food on the property through seedling plantings from the state. Opening areas for the deer to move more freely throughout the property and creating some meadow area for the deer to bed and graze would be an additional

step to attract more deer. Consider thinning all encroaching trees on the northeast side of the property and planting more native grasses; this would create a nearly 8-acre meadow on the direct property and be adjacent to three properties with nearly meadow like features. Malnutrition is the most common disease related to mule deer mortality, helping provide proper nutrition via land management would be one of the best methods of attracting deer to the property.

3. According to NMSU ACES program, keeping a variable habitat selection of meadow areas mixed with woodland cover will provide the best mix for habitat enhancement. They also state the effects on free water and mule deer attraction are unknown, but they will frequent areas with water if available. For the purpose of managing for deer and turkey having free standing water remains a relevant objective. More information on mule deer can be found on the NMSU website (https://aces.nmsu.edu/pubs/_l/L301.pdf)

Elk: Elk are found in the vicinity but not in high densities near the property. Managing for turkey and deer should remain the top priorities as increasing habitat for the two will simultaneously increase habitat and foraging availability for elk in the area.

- **Objective 2.3** - explore opportunities to develop water sources for the use of wildlife on the property.



The existing riparian area (Ephemeral and / or Intermittent) should receive attention as to its different ecological value. Below is the NM Forestry Practices definition of the various wetland classifications.

*A watershed is a network of surface streams, underground water flows, and other water bodies. Surface streams that flow year-around are called **perennial** streams. **Intermittent** streams only flow part of a year, typically in response to snowmelt. **Interrupted** streams are those that disappear underground only to reappear downstream. **Ephemeral** streams flow only in response to precipitation. **Washes**, similar to*

ephemeral streams, are dry streambeds in the desert that flow only after significant rainfall, usually associated with monsoonal activity.

The landowner has expressed interest in creating a large pond by creating holding areas where runoff would normally exist. This can be a difficult task as rain in the area may be intermittent and systems may not hold water year-round. See appendix D for climate data. To improve water holding utilizing a pool liner would yield the best results, otherwise using clay would be a good alternative. Utilizing a pool liner would hold water best and can be well hidden with aquatic vegetation and soil; additionally, it can be beneficial to having aquatic vegetation that may attract wildlife. When using a pool liner installation (see image below can be of utmost importance, if done incorrectly the liner will fail and will not achieve the intended result. New Mexico State Forester Clay Benton can be consulted further for information. Aquatic Consultants based out of Albuquerque has a history of pond and stream construction in the area. Additionally, Pentair products (among many others) can be a good resource for liners, bubblers, and advice.

Liner Installation Style

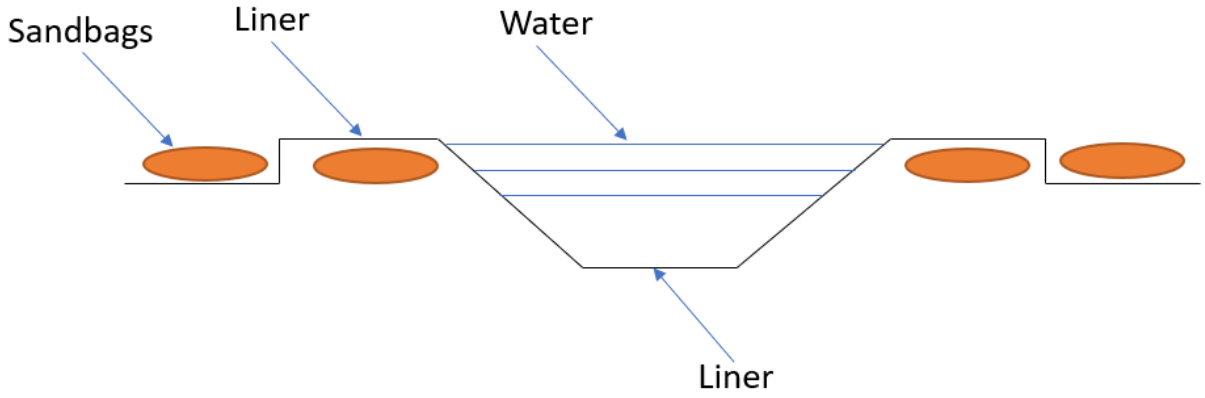
Water can be captured from sources on this property. The local Natural Resource Conservation District are the experts on and can be very helpful in identifying ways to take advantage of water resources on the property. Capturing runoff and rain fall can yield substantial amounts of water for irrigation, wildlife, and household use.

Natural Resource Conservation Service Center

Albuquerque Service Center

6200 Jefferson NE, Room 125
Albuquerque, NM 87109
(505) 761-5447

http://www.nrcs.usda.gov/wps/portal/nrcs/site/nm/home/



Water: landowners have expressed interest in retaining water on the property by creating an overflow area where a deep cut arroyo currently exists. By slightly damning the arroyo to retain a small portion *(no more than 10-acre feet*) and allowing excess to flow over landowners will be able to create an area where wildlife can frequent water resources. Water holding design should be based on landowner goals; there are many factors to consider in relation to building water troughs, ponds, etc. For example, simply damming water will provide water from ephemeral streams and arroyos but will quickly dissipate and absorb. If water retention is a main goal, then utilizing a pond liner or hard pack clay would be the best method to retain

water. Contact NM State Forester Clay Benton for more information, additionally provided is a link to DIY pond maintenance and building if water retention is a main goal. (https://www.motherearthnews.com/diy/garden-and-yard/backyard-pond-zm0z15onzmar)

Goal 3 - Implement perimeter control and access to restrict unwanted livestock and public access.

- **Objective 3.1** - Where feasible, perform fencing and barrier maintenance to limit unwanted livestock and public access to protect the natural habitat.

The property currently fences or has slopes that should serve to restrict domestic animal's access. When a trespass occurs, and the breach location is identified, efforts to close the gap can be made. This would include repair or installing fencing, cattle guards, or other barriers to be determined by the area in question. Contact information to adjacent USFS Lessees may be obtained by the local Forest Service Office so contact information can be on hand in event of a cattle trespass.

Goal 4 - Perform forest treatments that increase forest health benefits while reducing the risk of catastrophic stand replacement fire.

- **Objective 4.1** - Review existing and future thinning areas for dwarf mistletoe infestations and include recommendations in thinning guidelines to reduce infestations.

There was no Dwarf mistletoe identified in the Timber cruise. (This doesn't necessarily mean it does not exist on the property). The tree species diversity greatly helps to control any infestations, as the Dwarf Mistletoe is species specific. Future projects should further ensure there is no Dwarf Mistletoe presence in the area being treated.

- **Objective 4.2** - Review existing and future thinning areas for any other disease or insect infestation and make a priority for treatment.

With any potential project development additional site-specific information should be gathered and double checked for any present insect and disease. The insect activity may be encouraged by freshly cut trees so the timing of the project should be weighed against the benefit of the project before selecting a timeline. It very well may be worth chancing Insect activity when balancing a project with a fire safety project, but if the project can wait a bit the likelihood of issues could be mitigated.

- **Objective 4.2** - Review overall landscape for any lingering effects of *current drought conditions (if any).* Where feasible, modify thinning guidelines.

Note: Project specific cutting prescriptions will be developed for areas to be treated. These prescriptions will use elements of this management plan for any reference required by the project.

Lastly to note, thinning projects and historical cutting on the property can cause increased erosion. In areas of high erosion on the property it would be beneficial to take steps to prevent current or increase erosion. Utilization of "one rock dams" or other water slowing techniques could be used. This could be critically important in areas near standing water as erosion can often undermine walls and cause leaking or complete failure of natural water holding areas.

Natural Resources Additional Notes

Grazing

The effect of grazing on the growth cycle of grass is a great way to describe how plants respond to grazing. Over grazing can occur when you don't give the grass and forbs substantial time to recover between grazing cycles. Grazing can be used in high fire danger to remove fin flashy fuels. Proper grazing techniques can benefit both domestic livestock and wildlife on such a small piece of property. An example of this is domestic livestock may consume older stagnate grass allowing new grass to thrive providing for wild species nutrients. Grazing is also a type of natural disturbance to which many range plants are adapted. The effects of grazing depend—like those of other disturbances—on timing (when they happen), intensity (how severe they are), and frequency (how often they recur), and grazing can be managed in these terms. Implementing a strategy of graze and recovery on a set schedule will work the best for this property. Any number of domestic livestock that may be kept on the property will need to have supplement feed brought in. The landowner is very aware of grazing issues on the property.

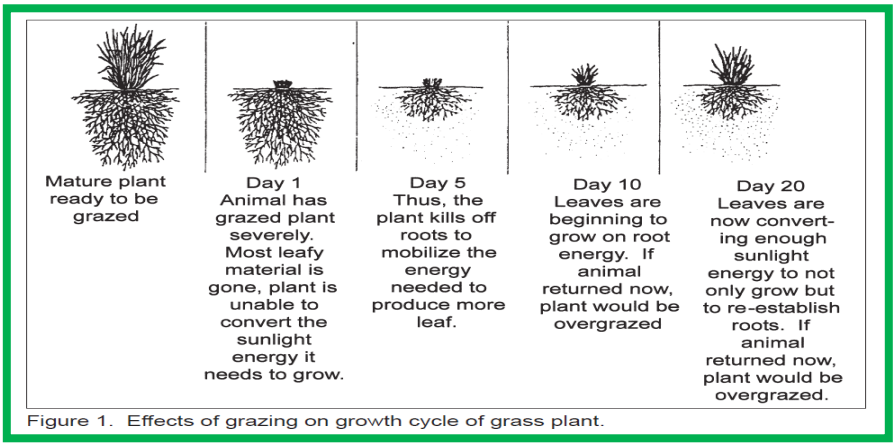


Figure 1. Effects of grazing on growth cycle of grass plant.

(Figure 1) Effect of grazing on the growth cycle of grass

Soils

There are some excellent techniques that can be used to control surface water and regenerate ground vegetation on the land by installing one-rock dams or log, slash, and/or chip berms. These structures slow the water flow on the surface so grasses and other vegetation can grow, and soil movement (erosion) is reduced. Larger-sized tree trunks if present can be placed on the contour of side slopes to catch water and sediment (stones can also be used). Berms made by machinery can be strategically placed on the contour to hold water to promote vegetative establishment and growth. For individual live Piñon pine trees, create rock, chip/debris, or slash berms above or below to slow water and provide moisture for these trees, which is so essential to their survival.

In drainages, rows of stones and boulders (one rock high dams) can be constructed to slow water and sediment flow. Trees can be placed lengthwise on the slope with the tops of the trees pointing downhill, so they are held in place better. Start by working on the highest areas and look for any key drainage areas to start controlling the speed and direction of the water. Then begin working down slope. By starting at the

top of the slopes you gain the most control over the water flow and it will move slower on the lower slopes since the amount and velocity is decreased.

Landowners may want to seed and mulch open areas created by any thinning with native species of grasses. Spread out bales of hay for mulch may provide a desirable seed bed. A good time for seeding is just prior to the monsoon season of July or prior to any thinning operations. The thinning operations will help set the seed in the soil for better germination and the slash will help prevent birds from eating and keep moisture in the soil longer. The wildlife expert could recommend grass and forbs seed mix that is beneficial to the identified wildlife of concern for the property.

Assistance Programs

See appendix H for more detail on assistance programs.

Forest Health Improvement Program (FHI) - This district has one program that can assist with forest thinning through the Forest Health Improvement program. This program is a seventy thirty cost share program. The program will pay seventy percent of the cost to thin and treat slash on a property.

Legacy - The legacy program very simply pays landowner to never develop their land. The land needs to have unique characteristics and be in danger of being subdivided. More information can be found at http://www.emnrd.state.nm.us/SFD/ForestMgt/ForestLegacy.html.

New Mexico Land Conservation Incentives Act – This program allows charitable donations of land or an interest in land (conservation easement) to public or private conservation agencies for conservation purposes and become eligible for a state tax credit. The maximum tax credit is 50% of the appraised value of the donation and a maximum of $250,000 per individual donor. Land conservation tax credits must be approved by the Energy, Minerals and Natural Resources Department Secretary in consultation with the Natural Lands Protection Committee. You can find more information about this program at http://www.emnrd.state.nm.us/SFD/Regulations/NMSFRegulations.html.

The Environmental Quality Incentives Program (EQIP) – This program was reauthorized in the Farm Security and Rural Investment Act of 2014 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. Timber production is considered agricultural production within this program. You can find more information about this program at http://www.nrcs.usda.gov/wps/portal/nrcs/main/nm/programs/financial/eqip/

The Wildlife Habitat Incentive Program (WHIP) – This program was a voluntary program for conservation-minded landowners who wanted to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Tribal or Pueblo lands. The Food, Conservation, and Energy Act of 2008 reauthorized WHIP as a voluntary approach to improving wildlife habitat in our Nation. In the 2014 Farm Bill, WHIP was rolled into the EQIP program (listed above in this section). The Natural Resources Conservation Service administers wildlife habitat-related projects through EQIP to provide both technical assistance and cost share assistance to establish and improve fish and wildlife habitat. Cost-share agreements between NRCS and the participant generally last from one year after the last conservation practice is implemented but not more than 10 years from the date the agreement is signed.

The Conservation Stewardship Program (CSP) – This program encourages land stewards to improve their conservation performance by installing and adopting additional activities, and improving, maintaining, and managing existing activities on agricultural land and nonindustrial private forest land. The NRCS will make CSP available nationwide on a continuous application basis. The State Conservationist, in consultation with the State Technical Committee and local work groups, will focus program impacts on natural resources that are of specific concern for a State, or the specific geographic areas within a State. Applications will be evaluated relative to other applications addressing similar priority resource concerns to facilitate a competitive ranking process among applicants within a State who face similar resource challenges. You can find more information about this program at http://www.nrcs.usda.gov/programs/new_csp/csp.html. This web page has additional NRCS programs that may be applicable to your property http://www.nm.nrcs.usda.gov/programs/.

The East Mountain Forest Health Program – This program is a Federal Funded program providing funds (when available) to the Claunch-Pinto Soil and Water Conservation District through New Mexico State Forestry. These funds are distributed on a first come first serve basis by the SWCD and can be used to thin up to 20 acres at a time.

Claunch-Pinto Soil and Water Conservation District
1206 South Highway 55
P.O. Box 129
Mountainair, NM 87036
(505) 847-2243
http://www.claunchpinto.org/

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. NM State Forestry can help with the sign up for this program.
https://www.treefarmsystem.org/

NM State Forestry District Office Information

District VI

Bernalillo District

5105 Santa Fe Hills Blvd NE
Rio Rancho, NM 87144
505-867-2334
505-867-2225 fax

Located off Highway 550, Santa Fe Hills Blvd, approximately 2 miles north of the light at SR 528, Rio Rancho

Approval Page

I have read the attached Forest Management Plan and find that the document will provide assistance in accomplishing the goals and objectives that I have for my property. It is my intention to implement the plan recommendations to the best of my ability, as time and circumstances permit. I will maintain any cost-shared practices for at least ten years.

Taylor Turpen Allison Turpen — 02/22/2024

Landowners: Taylor Turpen and Allison Turpen — Date

Todd Haines — 2/20/2024

Planner: Todd Haines — Date

Approved By:

Lawrence Crane — 2-24-2024

District Forester: Lawrence Crane — Date

Page Intentionally Left Blank

Appendix

Appendix A: Wildlife Report

PROJECT INFORMATION

Project Title:	Turpen Property Forest Stewardship Plan
Project Type:	(NO PROJECT REVIEW) SPECIES LIST ONLY
Latitude/Longitude (DMS):	34.746895 / -106.392718
County(s):	TORRANCE
Project Description:	This project is to develop a Forest Stewardship Plan. The data will be used to inform the recommendations in the plan. Landowner objectives include: Develop a comprehensive property map, Implement forest treatments and activities that improve habitat for key indicator wildlife species, Implement perimeter control and access to restrict unwanted livestock and public access and Perform forest treatments that increase forest health benefits while reducing the risk of catastrophic stand replacement fire.

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

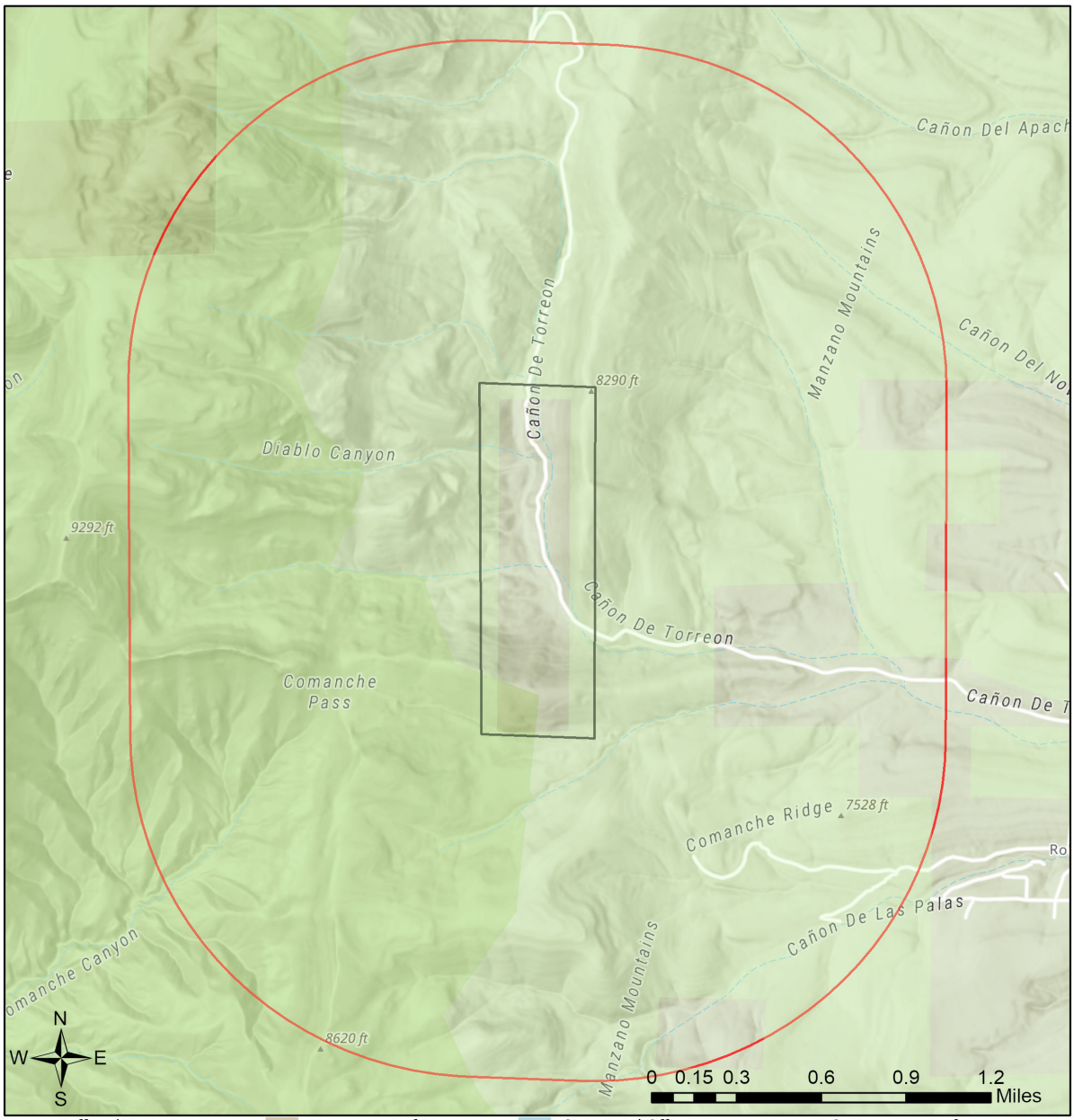
OVERALL STATUS

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.

Turpen Property Forest Stewardship Plan



- Buffered Project Boundary
- Project Boundary
- Bureau of Land Management
- City Land
- County Land
- Department of Defense
- Department of Energy
- NM Department of Game & Fish
- NM State Forestry Division
- NM State Parks
- National Park Service
- Private
- State Land Office
- State of New Mexico
- Tribal Land
- U.S. Army Corps of Engineers
- U.S. Bureau of Reclamation
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Natural Resources Conservation Service

USGS, New Mexico Department of Game and Fish (NMDGF), Natural Heritage New Mexico (NHNM), and USDA Forest Service,

Compiled by Richard Norwood of NHNM over the period 2020 to 2021.
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Special Status Animal Species Potentially within 2000 Meters of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI
Boreal Chorus Frog	Pseudacris maculata			SGCN
Northern Leopard Frog	Lithobates pipiens			SGCN
Peregrine Falcon	Falco peregrinus		T	SGCN
Mountain Plover	Charadrius montanus			SGCN
Flammulated Owl	Otus flammeolus			SGCN
Mexican Spotted Owl	Strix occidentalis lucida	LT		SGCN
Common Nighthawk	Chordeiles minor			SGCN
Lewis's Woodpecker	Melanerpes lewis			SGCN
Red-Headed Woodpecker	Melanerpes erythrocephalus			SGCN
Williamson's Sapsucker	Sphyrapicus thyroideus			SGCN
Olive-Sided Flycatcher	Contopus cooperi			SGCN
Bank Swallow	Riparia riparia			SGCN
Pinyon Jay	Gymnorhinus cyanocephalus			SGCN
Clark's Nutcracker	Nucifraga columbiana			SGCN
Juniper Titmouse	Baeolophus ridgwayi			SGCN
Pygmy Nuthatch	Sitta pygmaea			SGCN
Western Bluebird	Sialia mexicana			SGCN
Mountain Bluebird	Sialia currucoides			SGCN
Gray Vireo	Vireo vicinior		T	SGCN
Virginia's Warbler	Leiothlypis virginiae			SGCN
Black-Throated Gray Warbler	Setophaga nigrescens			SGCN
Grace's Warbler	Setophaga graciae			SGCN
Thick-billed Longspur	Rhynchophanes mccownii			SGCN
Cassin's Finch	Haemorhous cassinii			SGCN
Evening Grosbeak	Coccothraustes vespertinus			SGCN
Spotted Bat	Euderma maculatum		T	SGCN
Pale Townsend's Big-Eared Bat	Corynorhinus townsendii pallescens			SGCN
New Mexican Meadow Jumping Mouse	Zapus hudsonius luteus	LE	E	SGCN
Black Bear	Ursus americanus			SERI
Mountain Lion	Puma concolor			SERI
Mule Deer	Odocoileus hemionus			SERI
Western Ribbon Snake	Thamnophis proximus		T	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.

Special Status Plant Species Potentially within 2000 Meters of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMAC	NMRPCS
Sapello Canyon Larkspur	Delphinium sapellonis			SS

NMAC = New Mexico Administrative Code, E = Endangered; NMRPCS = New Mexico Rare Plant Conservation Strategy, SS = NM Rare Plant Conservation Strategy Species

Project Recommendations

This report includes a preliminary species list that may be used during early stages of project or conservation planning. Even if this report indicates that your proposed project location would require a custom review from a biologist, **no review will be returned** until additional project details are provided. **To obtain a project review**, please submit additional details regarding the **type** of project, project **objectives**, anticipated project **duration**, **timing** of project construction, the composition and dimensions/quantities of **materials** that will be utilized for project implementation, any **equipment** that will be used, anticipated **ground disturbance** that will occur, wildlife surveys or observations that have occurred on or near the project site, and **any other relevant details** regarding potential effects of project activities on wildlife or wildlife habitat. **Photographs** of the project site are especially useful.

Although this project report may include management recommendations based on the project location, additional conservation measures may be needed. The Department can not fully assess potential effects and associated management recommendations until a **project type and description** have been submitted and an appropriate **impact buffer** for that project type has been applied. Also, the species list within this report represents an estimation of special status species that could be present at the site of a small-scale project. Species lists for projects that occur across **broader geographic scales** (e.g., one or more counties, multiple habitat types) are more appropriately obtained from the **Department's Biota Information System of New Mexico (BISON-M) database**. Species lists generated by the ERT may contain modeled species distributions in order to predict species occurrences within areas that lack previous wildlife inventories or surveys. This list can be refined using occurrence-based information within BISON-M regarding wildlife-habitat relationships and biological needs for species that might be present within the project footprint.

Your project area intersects designated critical habitat for one or more species that are listed under the federal ESA. The Department recommends that you confirm this using the USFWS's Information for Planning and Consultation (IPAC) system (https://ipac.ecosphere.fws.gov/) and then reach out to the appropriate species lead(s) with the New Mexico Ecological Services Office of USFWS. The USFWS has authority to designate critical habitat for species listed under the ESA. The Department has no authority to designate critical habitat for species listed under the WCA or ESA.

The proposed project occurs within or near a riparian area. Because riparian areas are important wildlife habitats, the project footprint should avoid removing any riparian vegetation or creating ground disturbance either directly within or affecting the riparian area, unless the project is intended to restore riparian habitat through non-native plant removal and replanting with native species. If your project involves removal of non-native riparian trees or planting of native riparian vegetation, please refer to the Department's habitat handbook guideline for Restoration and Management of Native and Non-native Trees in Southwestern Riparian Ecosystems. The New Mexico Riparian Habitat Map (NMRipMap) may also provide useful information on local riparian habitat composition and structure.

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

- Altering surface or groundwater flow or hydrology,
- Disturbance to soil that modifies geomorphic properties or facilitates invasion of non-native vegetation.
- Affecting local surface or groundwater quality.
- Creating disturbance to wildlife utilizing these water features. Disturbance to wildlife can be reduced through practices including clustering infrastructure and activity wherever possible, avoiding large visual obstructions around water features, and limiting nighttime project operations or activities.

Department biologists are available for site-specific consultation regarding measures to assist with management and conservation of these habitat resources.

Your project could affect important components of wildlife habitat, including fawning/calving or wintering areas for species such as deer and elk, or general high wildlife movement and activity areas for large mammals. Mitigation measures should focus on high use sites and movement areas based on collar data and expert knowledge of Department and land management agency personnel. Management recommendations within these areas may include the following.

- Restrictions on noise-generating activities during wintering and calving/fawning seasons, specific timing of which may vary throughout the state. These activities would include oil and gas well pad development and operations that expose wildlife to loud noises from drilling, compressors, and pumping stations within 400 feet of the source.
- Modifying fences along high use areas to make them wildlife friendly and facilitate large animal movement.

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.

All migratory birds are protected against direct take under the federal Migratory Bird Treaty Act (16 U.S.C. Sections 703-712) and hawks, falcons, vultures, owls, songbirds, and other insect-eating birds are protected under New Mexico State Statutes (17-2-13 and 17-2-14 NMSA), unless permitted by the applicable regulatory agency. To minimize the likelihood of adverse impacts to migratory bird nests, eggs, or nestlings during pipeline construction, the Department recommends that ground disturbance and vegetation removal activities be conducted outside of the primary migratory bird breeding season of April 15-September 1, or earlier if raptors are a primary concern or when working in low- elevation habitats such as deserts. If ground disturbing and clearing activities during the breeding season cannot be avoided, the area should be surveyed for active nest sites (with birds or eggs present in the nesting territory), and when occupied, nest disturbance should be avoided until young have fledged. For any active nests, adequate buffer zones should be established to minimize disturbance to nesting birds. Buffer distances should be 100 feet from songbird and raven nests, and 0.25 mile from raptor nests. Active nest sites in trees or shrubs that must be removed should be mitigated by qualified biologists or wildlife rehabilitators.

The list of New Mexico Species of Greatest Conservation Need (see link, page 14, table 5) and the federal list of Birds of Conservation Concern should be reviewed to fully evaluate potential effects to migratory birds from your proposed project. Federal agencies are also required under Executive Order 13186 to implement standards and practices that lessen the amount of unintentional take attributable to agency actions. These conservation measures are strongly recommended to ensure persistence of migratory bird species whose populations are small and/or declining within New Mexico.

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 over the 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 may also be necessary under the federal ESA or National Environmental Policy Act (NEPA). Further site-specific recommendations may be proposed during ESA and/or NEPA analyses, or through coordination with affected federal agencies.

The below description is a broad overall description for similar habitats. This is for reference only.

Rocky Mountain Lower Montane Forest
NVC Name
Southern Rocky Mountain Lower Montane Forest (M022)
SWAP General Vegetation Type
ALPINE and MONTANE VEGETATION

The Rocky Mountain Lower Montane Forest [M022] is a mid-elevation (2,350-3300 m (7,700-10800 ft)) forest, woodland, and savanna habitat that occurs in the Southern Rocky and Arizona/New Mexico Mountains ecoregions, as well as isolated locations in the Colorado Plateaus and High Plains and Tablelands ecoregions. Characteristic trees are predominantly conifers and include white fir (Abies concolor), Douglas-fir, ponderosa pine, limber pine (Pinus flexilis), southwestern white pine (P. strobiformis), and Rocky Mountain juniper (Juniperus scopulorum). Cold-deciduous trees occasionally mix in the canopy or are dominant in some locations, e.g., quaking aspen and big-tooth maple (Acer grandidentatum). At the lower-elevation margins, Mexican piñon (Pinus cembroides), two-needle piñon (P. edulis), and alligator juniper (Juniperus deppeana) may be present in the subcanopy. Cold-deciduous, broad-leaved shrubs can be common in the undergrowth, e.g., Rocky Mountain maple (Acer glabrum), Gambel's oak, and New Mexico locust (Robinia neomexicana). In closed-canopy conditions, grasses or forbs may be sparse. Under more open canopies, grasses in particular may be abundant, leading to the formation of savanna-like woodland. Representative graminoids include mountain muhly (Muhlenbergia montana), Arizona fescue (Festuca arizonica), fringed brome (Bromus ciliates), and Ross' sedge (Carex rossii). This forest type occurs across a broad range of soils, geology, and topographical conditions. Fire regimes vary from mixed severity (surface and canopy fires) to low severity (mostly frequent surface fires, e.g., savannas). In general, fire suppression has led to encroachment of more shade-tolerant, less fire-tolerant species, resulting in an attendant increase in fire hazard.

Appendix B: Soils Report

United States Department of Agriculture

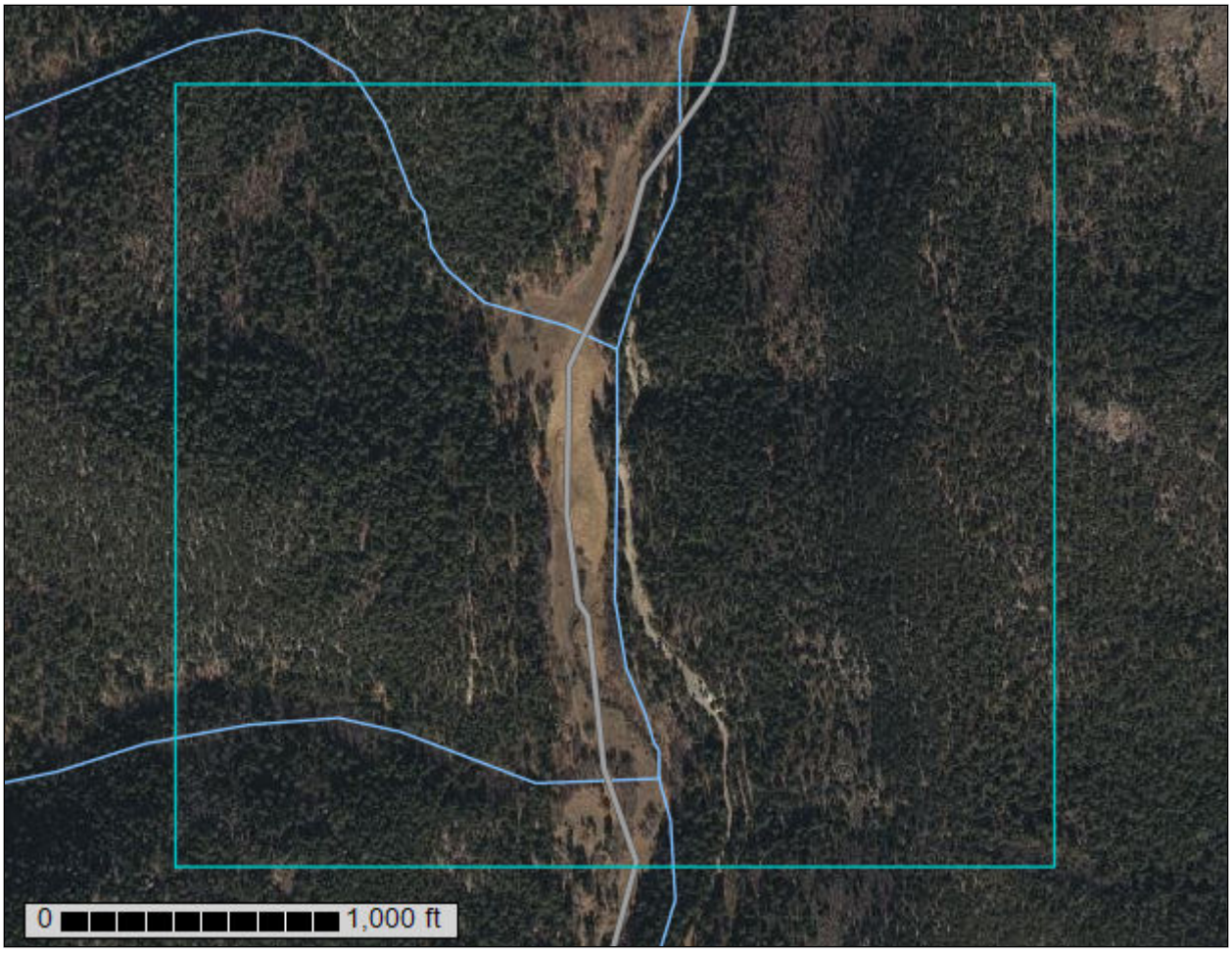
NRCS

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 Torrance Area, New Mexico

Turpen Property



January 23, 2024

Preface

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

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

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

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

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

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

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

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

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

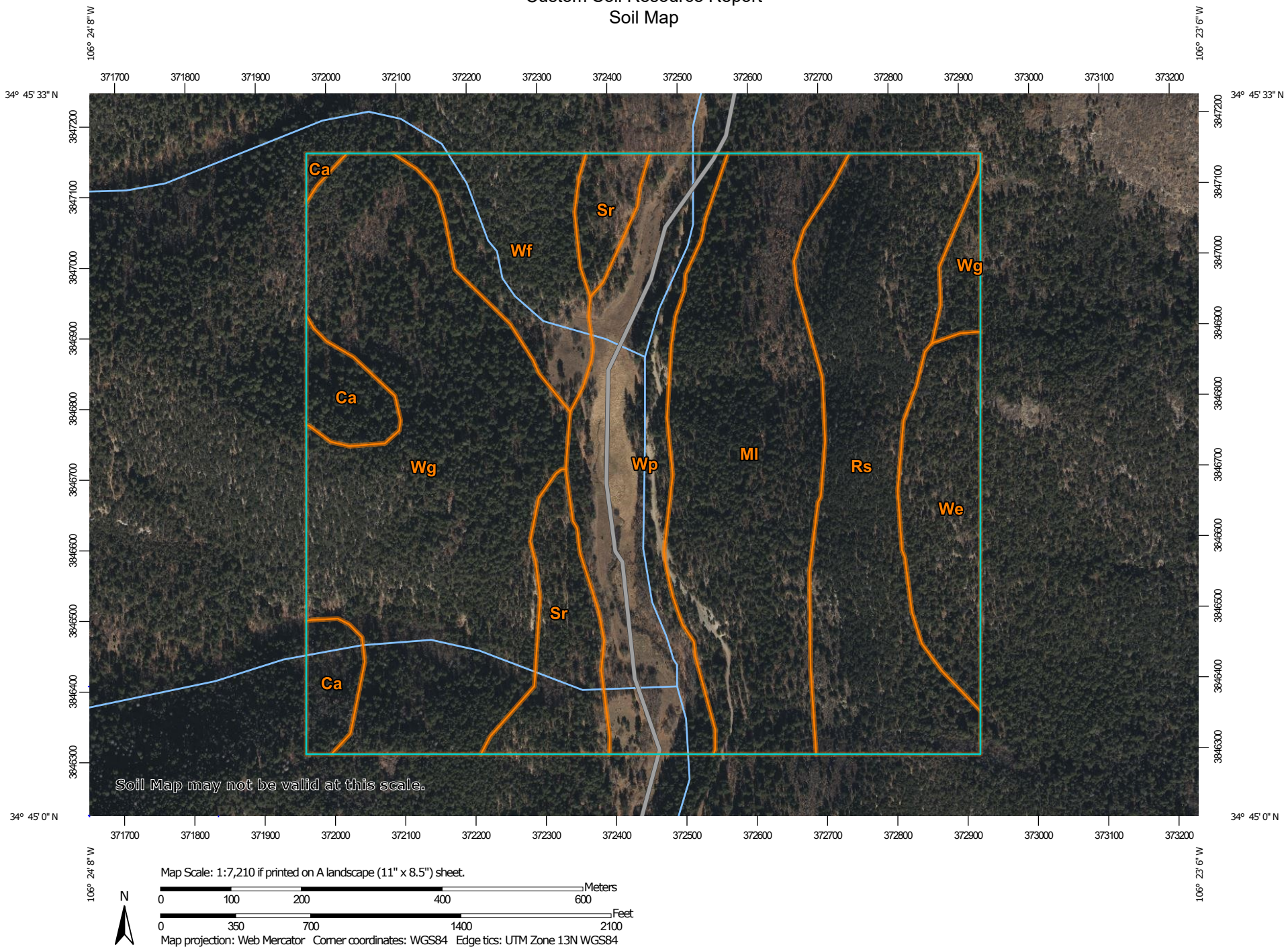
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:7,210 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

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: Torrance Area, New Mexico
Survey Area Data: Version 18, Sep 7, 2023

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 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
Ca	Capillo loam, 15 to 50 percent slopes	7.5	3.7%
Ml	Mirabal stony sandy loam, 40 to 80 percent slopes	38.7	19.1%
Rs	Rock outcrops and Slides	35.2	17.4%
Sr	Supervisor loam, 40 to 80 percent slopes	12.1	6.0%
We	Wilcoxson stony loam, 5 to 20 percent slopes	12.1	6.0%
Wf	Wilcoxson stony loam, 20 to 50 percent north slopes	13.1	6.5%
Wg	Wilcoxson stony loam, 15 to 45 percent south slopes	56.9	28.1%
Wp	Witt loam, 1 to 6 percent slopes	26.7	13.2%
Totals for Area of Interest		**202.4**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Torrance Area, New Mexico

Ca—Capillo loam, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: 1lgpx
Elevation: 6,500 to 8,300 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Capillo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Capillo

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear, convex, concave
Parent material: Alluvium derived from limestone, sandstone, and shale

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 40 inches: clay
H3 - 40 to 44 inches: bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
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: 1 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Wilcoxson

Percent of map unit: 8 percent
Ecological site: R039XB056NM - Loamy
Hydric soil rating: No

Wilcoxson

Percent of map unit: 7 percent
Ecological site: R039XB056NM - Loamy
Hydric soil rating: No

MI—Mirabal stony sandy loam, 40 to 80 percent slopes

Map Unit Setting

National map unit symbol: 1lgrg
Elevation: 7,800 to 9,200 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Mirabal and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mirabal

Setting

Landform: Mountain slopes
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium derived from metamorphic rock

Typical profile

H1 - 0 to 9 inches: stony sandy loam
H2 - 9 to 21 inches: very stony sandy loam
H3 - 21 to 25 inches: bedrock

Properties and qualities

Slope: 40 to 80 percent
Depth to restrictive feature: 20 to 35 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F048AY925CO - Ponderosa Pine Forest
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Rs—Rock outcrops and Slides

Map Unit Setting

National map unit symbol: 1lgsc
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 70 percent
Rubble land: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: fragmental material

Properties and qualities

Slope: 10 to 60 percent
Depth to restrictive feature: 0 inches to lithic bedrock
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)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Description of Rubble Land

Typical profile
H1 - 0 to 60 inches: fragmental material

Properties and qualities
Slope: 3 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 15 percent
Hydric soil rating: No

Sr—Supervisor loam, 40 to 80 percent slopes

Map Unit Setting
National map unit symbol: 1lgsm
Elevation: 7,500 to 9,200 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition
Supervisor and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Supervisor

Setting
Landform: Canyons
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metamorphic rock

Typical profile

H1 - 0 to 13 inches: stony loam
H2 - 13 to 30 inches: very stony loam
H3 - 30 to 34 inches: bedrock

Properties and qualities

Slope: 40 to 60 percent
Depth to restrictive feature: 20 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: 1 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: F039XB105NM - Pseudotsuga menziesii-Pinus ponderosa/ Symphoricarpos albus
Hydric soil rating: No

Minor Components

Mirabal

Percent of map unit: 10 percent
Ecological site: F048AY925CO - Ponderosa Pine Forest
Hydric soil rating: No

We—Wilcoxson stony loam, 5 to 20 percent slopes

Map Unit Setting

National map unit symbol: 1lgt2
Elevation: 6,500 to 8,000 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Wilcoxson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilcoxson

Setting

Landform: Ridges
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone

Typical profile

H1 - 0 to 2 inches: stony loam
H2 - 2 to 16 inches: silty clay loam
H3 - 16 to 60 inches: bedrock

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
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: 15 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R039XB056NM - Loamy
Hydric soil rating: No

Minor Components

Wilcoxson

Percent of map unit: 5 percent
Ecological site: R039XB056NM - Loamy
Hydric soil rating: No

Wilcoxson

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

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Wf—Wilcoxson stony loam, 20 to 50 percent north slopes

Map Unit Setting

National map unit symbol: 1lgt3
Elevation: 650 to 7,000 feet
Mean annual precipitation: 8 to 50 inches
Mean annual air temperature: 40 to 55 degrees F
Frost-free period: 70 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wilcoxson and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilcoxson

Setting

Landform: Ridges
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone

Typical profile

H1 - 0 to 2 inches: stony loam
H2 - 2 to 30 inches: silty clay loam
H3 - 30 to 60 inches: bedrock

Properties and qualities

Slope: 20 to 50 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
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: 15 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R039XB056NM - Loamy

Hydric soil rating: No

Minor Components

Turkeysprings

Percent of map unit: 5 percent
Ecological site: F039XA002NM - Pinus ponderosa-Pseudotsuga menziesii/ Quercus gambelii-Cercocarpus montanus
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Wg—Wilcoxson stony loam, 15 to 45 percent south slopes

Map Unit Setting

National map unit symbol: 1lgt4
Elevation: 650 to 7,000 feet
Mean annual precipitation: 8 to 50 inches
Mean annual air temperature: 40 to 55 degrees F
Frost-free period: 70 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wilcoxson and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilcoxson

Setting

Landform: Ridges
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone

Typical profile

H1 - 0 to 2 inches: stony loam
H2 - 2 to 24 inches: silty clay loam
H3 - 24 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
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: 15 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R039XB056NM - Loamy
Hydric soil rating: No

Minor Components

Turkeysprings

Percent of map unit: 5 percent
Ecological site: F039XA002NM - Pinus ponderosa-Pseudotsuga menziesii/ Quercus gambelii-Cercocarpus montanus
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Wp—Witt loam, 1 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1lgtc
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 90 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Witt and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Witt

Setting

Landform: Fan piedmonts
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 38 inches: clay loam
H3 - 38 to 60 inches: loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): 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: 15 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: High (about 11.2 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

Tapia

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

Harvey

Percent of map unit: 5 percent
Ecological site: R042CY108NM - Limy
Hydric soil rating: No

Dean

Percent of map unit: 5 percent
Ecological site: R042CY108NM - Limy
Hydric soil rating: No

Witt

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

References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix C: Timber Inventory

What is Basal Area, and how does it relate to overall forest health?
Imagine one acre of forest or Piñon - juniper woodland.

Then IMAGINE, every tree being removed from a point 4½ feet from the ground. This would look like a forest of 4½-foot stumps; remember, we're only IMAGINING this.

At the top of each imaginary 'stump' is a circular surface area. Some large, perhaps more than one square foot of surface area, some small, perhaps a fraction of a square foot of surface area. If a Juniper has multiple stems from the ground, the surface area is measured at ground level.

Determine the TOTAL square feet by adding up all the surface areas of each tree 'stump' on the acre.

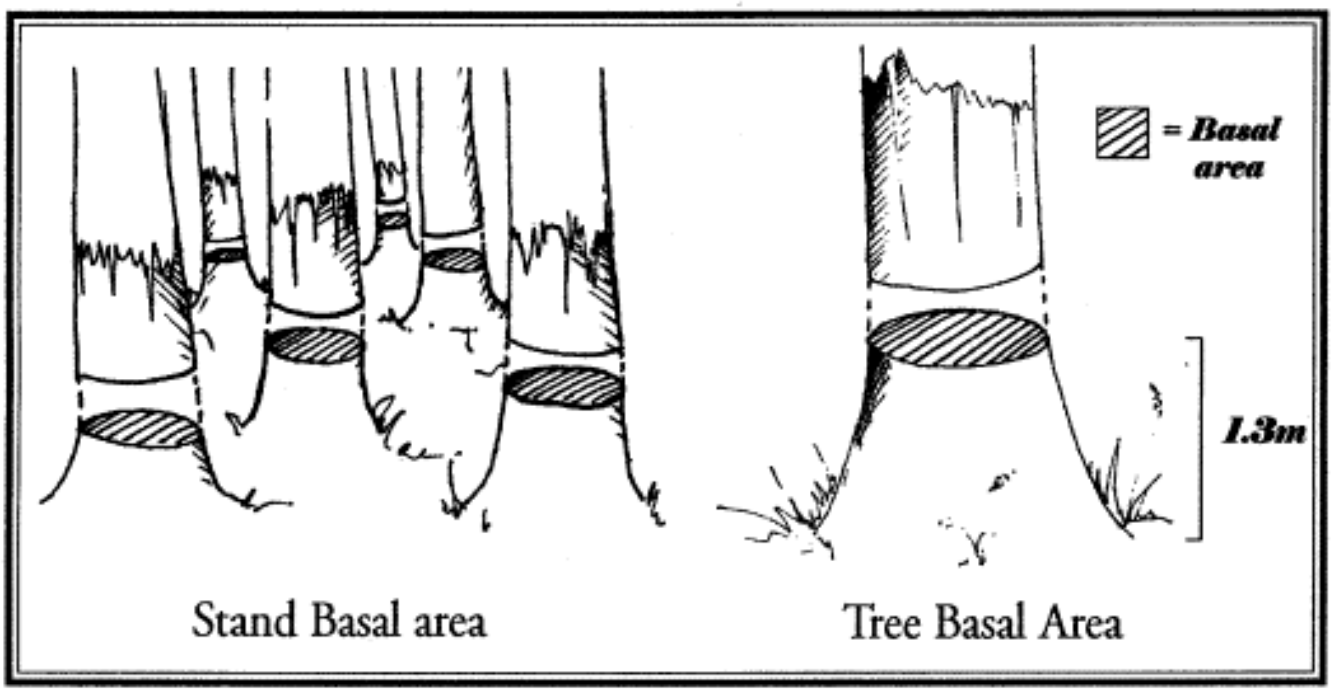
That total is the total basal area in square feet per acre.

Basal area per acre is an indication of tree stocking level on the land.

Ponderosa and Piñon pine occupy a site completely at a basal area of about 60 to 70 square feet of basal area per acre. 'Occupied' refers to tree roots having sufficient space, water, and nutrients available for normal tree growth and health.

Higher stocking levels demand higher levels of water, which the land often does not have. At higher levels of stocking, overcrowded trees become stunted, stressed, stagnant, and prone to insect & disease attack, and general decline, not to mention catastrophic fire (Los Alamos). The situation represents poor forest health.

~ George Dude, New Mexico EMNRD Forestry Division, 2-12-02 ~



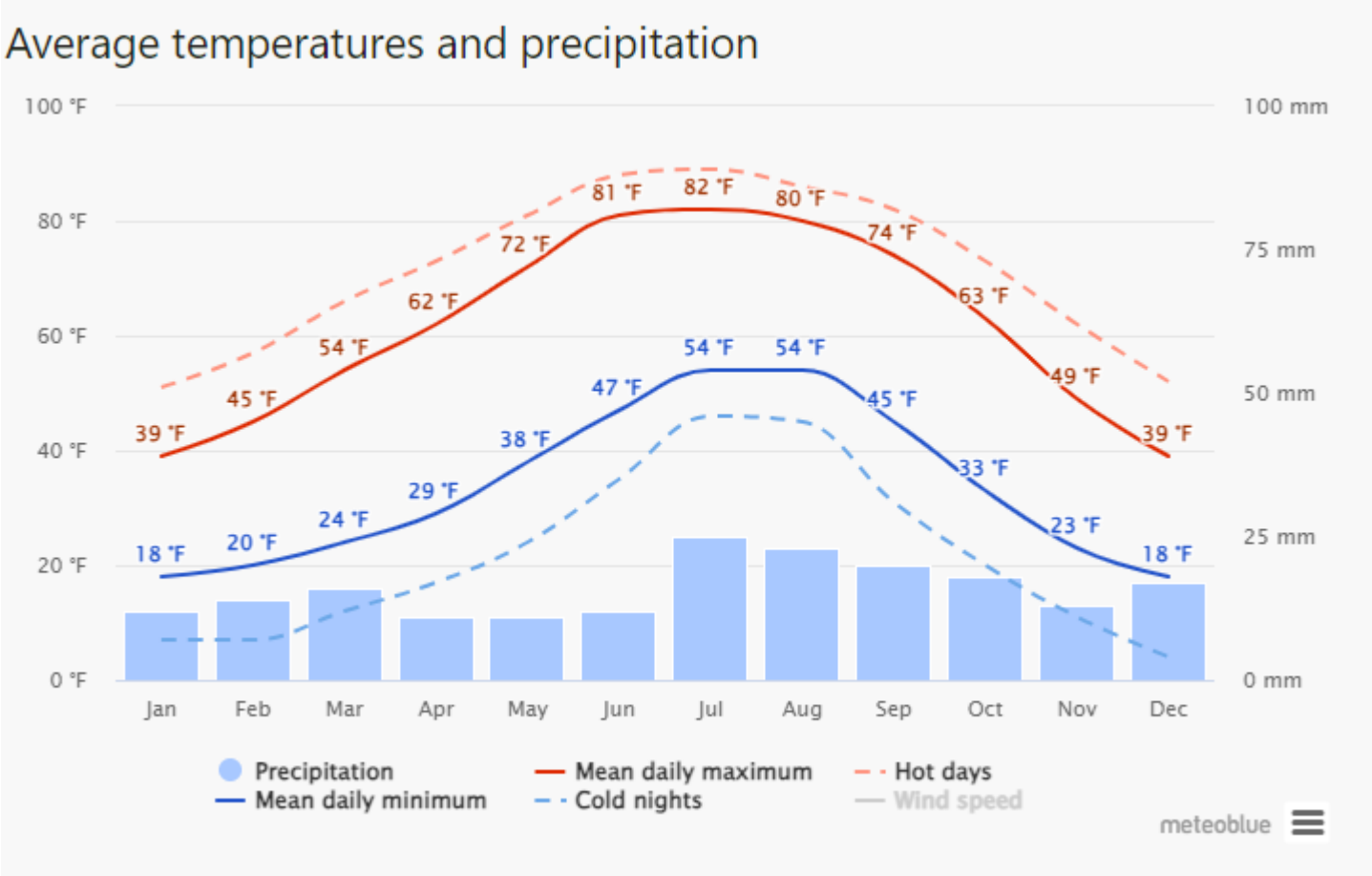
Appendix D: Climate Information

The following data was taken from the Meteoblue web site. https://www.meteoblue.com/

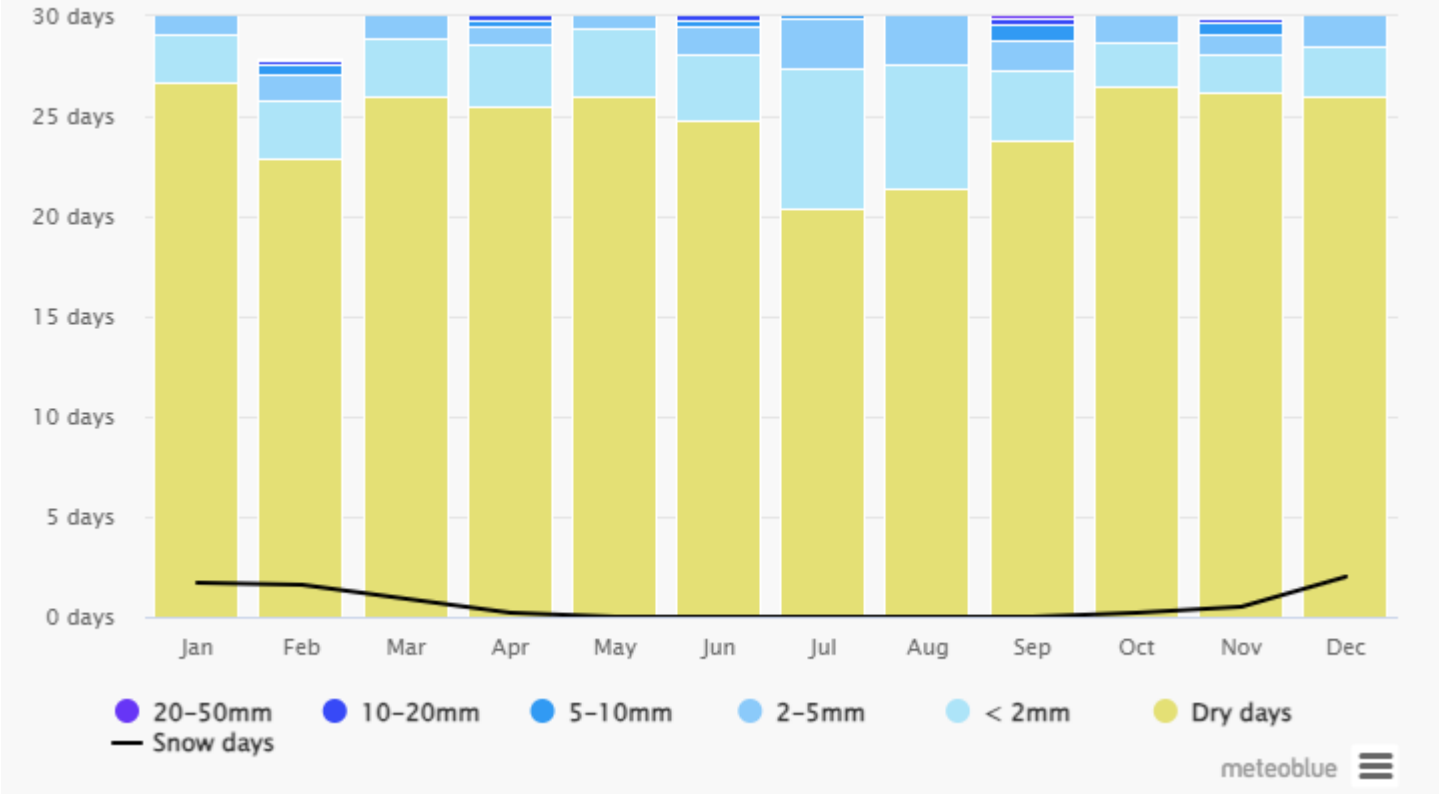
The following information provides CURRENT data on climate variables for the Manzano Mountains. This information may be used when developing projects on the property.

The meteoblue climate diagrams are based on 30 years of hourly weather model simulations and are available for every place on Earth. They give good indications of typical climate patterns and expected conditions (temperature, precipitation, sunshine, and wind).

Below is the Monthly Average Temperature for the Manzano Mountains. The second Graphic shows the Monthly average precipitation amounts.



Precipitation amounts



Appendix E: Cruise

Below is the cruise sheet that is discussed in the plan body.

NEW MEXICO FORESTRY DIVISION - FCI 20011, VARIABLE PLOT CRUISE

LANDOWNER: Taylor Turpin
ADDRESS:
LOCATION: Red Canyon

DATE: 9/26/23 & 10/23/23
FOREST TYPE: Mixed Conifer
TRACT ACRES: 160

PAGE ___ OF ___
BA FACTOR: 10
NUM.OF PLOTS: 18
BOARDER LINE: IN OUT

PLOT NO.	SPECIES (codes)	DIAMETER CLASS (Inches) and SIZE CLASS																										
		SAPLINGS			POLETIMBER			SAWTIMBER																				
			1-2.99	3-4.99	5-6.99	7-8.99	9-10.99	11-12.99	13-14.99	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+										
		BA	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32+	<4.5'			11.78'				50/5'	Y/N
1	PIPO			1	3																							
1	PSME		1																									
2	PIPO									1	1																	
2	PSME				1		1			1																		
2	JUDE					1																						
3	PIPO									1																		
3	PSME				1																							
3	JUDE											1				1												
3	JUSC					1																						
4	PSME				1																							
4	JUSC							1																				
5	PIPO			1						1																		
5	PSME			1																								
6	PIPO							1	1		1			4														
7	PSME							3	1			1																
7	PIPO													3														
8	PSME					1		3	2																			
8	PIPO										1			1														
9	PSME					2	2	2			2			1														
9	PIPO					1																						
10	PSME			1	2	2	1	1																				
10	PIPO						1			1	1																	
11	PSME						1	1	1	3	1	1		1														
12	PIPO					1			2	4																		
13	PSME						2		1	1	1	1																
14	PSME					2			2																			
14	PIPO				1		3			3																		
15	PSME						1				1																	
16	PSME			1						1																		
17	PSME										2																	
17	PIPO									1		1																
18	PSME									1	1			1														
18	PIPO									1				3														

PLOT NO.	SPECIES (codes)	DIAMETER CLASS (Inches) and SIZE CLASS																										
		SAPLINGS			POLETIMBER			SAWTIMBER																				
			1-2.99	3-4.99	5-6.99	7-8.99	9-10.99	11-12.99	13-14.99	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+										
		BA	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32+	<4.5'			11.78'				50/5'	Y/N

Appendix F: Noxious Weeds in New Mexico

Class A Species

Class A species are currently not present in New Mexico or have limited distribution. Preventing new infestations of these species and eradicating existing infestations is the highest priority.

Common Name	Scientific Name
-Alfombrilla	Drymaria arenariodes
-Black henbane	Hyoscyamus niger
-Camelthorn	*Alhagi psuedalhagi*
-Canada thistle	*Cirsium arvense*
-Dalmation toadflax	*Linaria dalmatica*
-Diffuse knapweed	*Centaurea diffusa*
-Dyer's woad	*Isatis tinctoria*
-Eurasian watermilfoil	*Myriophyllum spicatum*
-Giant salvinia	*Salvinia molesta*
-Hoary cress	*Cardaria spp.*
-Hydrilla	*Hydrilla verticllata*
-Leafy spurge	*Euphorbia esula*
-Oxeye daisy	*Leucanthemum vulgare*
-Parrotfeather	*Myriophyllum aquaticum*
-Purple loosestrife	*Lythrum salicaria*
-Purple starthistle	*Centaurea calcitrapa*
-Ravenna grass	*Saccharum ravennae*
-Scotch thistle	*Onopordum acanthium*
-Spotted knapweed	*Centaurea biebersteinii*
-Yellow starthistle	*Centaurea solstitialis*
-Yellow toadflax	*Linaria vulgaris*

Class B Species

Class B Species are limited to portions of the state. In areas with severe infestations, management should be designed to contain the infestation and stop any further spread.

Common Name	Scientific Name
-African rue	*Peganum harmala*
-Chicory	*Cichorium intybus*
-Halogeton	*glomeratus*
-Malta starthistle	*Centaurea melitensis*
-Musk thistle	*Carduus nutans*
-Perennial pepperweed	*Lepidium latifolium*
-Russian knapweed	*Acroptilon repens*
-Poison hemlock	*Conium maculatum*
-Teasel	*Dipsacus fullonum*
-Tree of heaven	*Ailanthus altissima*

Class C Species

Class C species are widespread in the state. Management decisions for these species should be determined at the local level, based on feasibility of control and level of infestation.

Common Name	Scientific Name
-Bull thistle	Cirsium vulgare
-Cheatgrass	*Bromus tectorum*
-Jointed goatgrass	*Aegilops cylindrica*
-Russian olive	*Elaeagnus angustifolia*
-Saltcedar	*Tamarix spp.*
-Siberian elm	*Ulmus pumila*

Watch List Species

Watch List species are species of concern in the state. These species have the potential to become problematic. More data is needed to determine if these species should be listed. When these species are encountered, please document their location, and contact appropriate authorities.

Common Name	Scientific Name
-Crimson fountaingrass	*Pennisetum setaceum*
-Giant cane	*Arundo donax*
-Meadow knapweed	*Centaurea pratensis*
-Pampas grass	*Cortaderia sellonana*
-Quackgrass	*Elytrigia repens*
-Sahara mustard	*Brassica tournefortii*
-Spiny cocklebur	*Xanthium spinosum*
-Wall rocket	*Diplotaxis tenuifolia*

http://www.nmvma.com/images/Troublesome%20Weeds%20of%20NM.pdf

Appendix G: Tree Selection Guidelines

In deciding which trees to leave, trees will be selected based on their position in the canopy, vigor, diameter, and external or internal defects. Consider the following points as cause for removal:

1. Insect infestation and/or disease infection.
2. Suppressed trees and weak intermediate and co-dominant trees should be cut first.
3. Broken or dead tops.
4. Sweep, lean, and crook.
5. Crowns touching unless in groups or clumps.
6. Porcupine damage.
7. Forked tops.
8. Poor vigor, poor crowns.
9. Mechanical damage.
10. Poor form or excessive taper.
11. Severe mechanical damage.

"Wolf" trees with numerous big limbs that run the length of the tree to its base.

The trees exhibiting the greatest health and vigor will be retained. In most cases, this should be saw timber-sized trees; in thickets of younger regeneration, "leave trees" will be the larger saplings and pole timber with a dominant or codominant position in the forest canopy and a well-developed crown (live branches). Commercial species (ponderosa pine, white fir, & Douglas-fir) should be favored where available.

The quality of the residual stand should not be sacrificed to achieve optimal group and clump spacing. That is, a poor-quality tree (e.g. forked top, diseased, crooked, etc.) will not be selected for retention over a high-quality tree just because it would create better groups and clumps.

Trees receiving top priority for removal should be those with bark beetle infestations or moderate to heavy dwarf mistletoe infections (defined as a dwarf mistletoe rating (DMR) greater than three, i.e., more than 50% of the live crown infected with dwarf mistletoe fruiting bodies). Surrounding trees should be monitored to control the additional spread of these pests. If dwarf mistletoe is found, the most heavily infected trees should be removed first to slow the spread of the disease and reduce its extent.

Next, trees with signs of other diseases, damage, defects, or suppression should be removed. Undesirable defects include forked tops, crooks, sweeps, and abnormal (non-uniform) taper. Trees with obvious signs of decay (conks, woodpecker holes, dead tops, etc.) or damage (snow breakage, lightning, porcupines, etc.) should also be removed.

Generally, most undesirable trees can be removed without the stocking level dipping below a minimum level (e.g., 50 square feet per acre). A stocking level slightly less than this is acceptable, especially if the removed trees were "contagious" (e.g., attacked by bark beetles or infected with dwarf mistletoe). On the other hand, it may be better to leave a couple of well-spaced, defective trees (e.g., forked trees, slightly crooked trees, etc.) than to let the stocking slip below 50 square feet per acre.

Resources for Private Forest Landowners in New Mexico

Are you a private forest landowner in New Mexico?

You may be interested in learning more about your forest, improving the health of your land, creating better wildlife habitat, addressing wildfire hazard, or improving the health of your riparian forest (or bosque), or learning more about the forest industry. If so, you may be unsure of where to begin. The following pages contain resources for technical and financial assistance for forest landowners, including resources for **forest health, forest thinning** and more.

New Mexico State Forestry (NMSF)

Technical Assistance

New Mexico State Forestry (NMSF) has technical experts in its District Offices statewide. For more information, visit http://www.emnrd.state.nm.us/SFD/ or call 505-476-3325.

A Note on Assistance: Work with Your Local District

For most of New Mexico State Forestry's assistance programs, it is recommended that you contact your local NMSF District. Some of these resources require pre-application preparation with your District before an application is submitted. For the NMSF office near you, visit http://www.emnrd.state.nm.us/SFD/contact.html or call 505-476-3325.

Hazardous Fuels Treatments on Non-Federal Lands
Purpose: Projects must reduce fire threat to communities that are surrounded by hazardous forest fuels which pose a threat in the event of a wildfire. Outcomes include improving wildfire prevention and suppression, reducing hazardous fuels, and restoring fire-adapted ecosystems.

Who Can Apply: Local governments, tribal governments, and political subdivisions of the state (i.e. Soil and Water Conservation Districts). Projects must be in communities adjacent to federal lands where surrounding forest fuels pose a hazard in the event of a wildfire.

Amount: Grant amounts vary up to $300,000

Deadline: Applications are typically due in March of each year

Match Requirement: 10% non-federal

Contact: NM State Forestry

Wildland Urban Interface Grants
Purpose: The planning and implementation of hazardous fuels mitigation projects that will reduce the fire threat in Wildland Urban Interface (WUI) areas in New Mexico. The emphasis is on hazardous fuel reduction, information and

education, and community and homeowner action. Outcomes include improving wildfire prevention and suppression, reducing hazardous fuels, and restoring fire-adapted ecosystems.

Who Can Apply: Local governments, tribal governments, and political subdivisions of the state (i.e. Soil and Water Conservation Districts). Projects must be within the boundaries of an approved Community Wildfire Protection Plan (CWPP).

Amount: Grant amounts vary up to $300,000

Match Requirement: 1:1 non-federal.

Deadline: Applications are typically due in March of each year

NM State Forestry

Visit https://www.westernforesters.org/wui-grants for more information.

Invasive Plants

Purpose: Invasive plant management activities where noxious weed invasions threaten forest health, address species on the NM Department of Agriculture's "Noxious Weed List" and are encouraged to be within a Cooperative Weed Management Area (CWMA) on non-federal lands or demonstrate partnership with a CWMA. Components of the projects may include integrated weed management, mapping and inventory, monitoring, early detection, and prevention, planning and coordination, and awareness and education.

Who Can Apply: Non-federal government entities

Amount: Grant amounts vary from $5,000 up to $20,000

Match Requirement: 1:1 non-federal.

Deadline: Fall – Winter (the Request for Proposals typically released in August or September)

Contact: NM State Forestry.

Forest Health Initiative

Purpose: Provides cost share funds for the reduction of insect and pathogen (disease) risk through forest improvement. The objective is to improve degraded (e.g. overcrowded, infested, and/or infected) forestland to a healthier, more resilient state.

Who Can Apply: Landowners who have a minimum of 10 acres of forestland and a stewardship/management plan in place. However, up to 10% of Forest Health Initiative funds can be used to help landowners develop long-term forest management plans where none presently exist. Eligible applicants include private, state, and local government owners of forest or woodlands.

Amount: Grant amounts vary up to $100,000

Match Requirement: 30% non-federal.

Deadline: Varies depending on funding

Forest Legacy Program

Purpose: Seek perpetual conservation easements on private forestland to conserve working forests (forests that provide water quality, habitat for threatened and endangered wildlife species, recreation, etc.) that are threatened by development or conversion to non-forest use. This program seeks partners for nationally significant project sites that rank well in the categories of being important, strategic, threatened, and ready (i.e. "shovel ready").

Who Can Apply: Private landowners with a minimum of 40 acres, of which at least 75% is forested land

Amount: Varies year-to-year based on an approved budget by the U.S. Congress

Match Requirement: 25% non-federal. The non-federal match can be the donation of 25% of the conservation easement value.

Deadline: September 1st of each year for review and a vote to proceed from the State Forest Stewardship Committee

Contact: NM State Forestry

Visit http://www.emnrd.state.nm.us/SFD/ForestMgt/ForestLegacy.html for more information on criteria and eligibility.

Urban & Community Forestry

The Urban and Community Forestry program provides communities with financial, technical, and educations assistance.

Financial assistance: NMSF offers funding to local governments and non-profit organizations:
New Mexico Forest Re-Leaf provides funds for tree planting in public spaces; the **Community Forestry Assistance Grant** funds provide for local urban and community forestry program development, tree inventory and assessment, professional training and development, and environmental education.

Technical assistance: NMSF can provide technical resources and training for municipal staff and advocacy/advisory groups. Our focus areas include tree ordinances, urban forest assessments and management plans, and professional staff development. NMSF also administers the Arbor Day Foundation, Tree City, Tree Campus, and Tree Line USA recognition programs.

Educational assistance: NMSF can provide resources to assist with volunteer coordination, and adult and youth education related to healthy urban and community forests. This includes resources developed for our statewide Tree Stewards Program, and curriculum for K-12 students.

Assistance with trees in your yard or landscape: NMSF can assist with your questions and help put you in touch with certified arborists or other "green" professionals.

For more information visit http://www.emnrd.state.nm.us/SFD/CommunityFor/Community or call the Urban and Community Forestry Program Manager at 505-629-6643.

Seedling Program

The Forestry Division offers tree and shrub seedlings for sale to landowners who own at least one acre of land in New Mexico and who agree to use the seedlings for conservation purposes such as post-fire restoration, erosion control, riparian restoration, wildlife habitat improvement, and windbreaks. Approximately 60 species of tree and shrubs are available. Conservation seedlings are distributed during the fall and spring. Spring sales start the first Monday of December with distribution in March and April. Fall sales start in early July with distribution from mid-September through mid-October.

Visit http://www.emnrd.nm.us/SFD/treepublic/ConservationSeedlings.html for more information or call 505-476-3334.

Wildfire

- New Mexico State Forestry (NMSF) has many **resources related to wildfire**, such as wildfire planning. For more information, visit http://www.nmforestry.com or call the main office in Santa Fe at 505-476-3325.
- Many programs exist for community **wildfire preparedness**, including Firewise USA™, Ready, Set Go! and Fire Adapted Communities. For links to these, visit http://www.emnrd.state.nm.us/SFD/FireMgt/FirePreventionandOutreachProgram.html.
- To sign up for **wildfire alerts**, visit https://nmfireinfo.com/.
- **After a Wildfire**: Visit http://afterwildfirenm.org/ or call 505-345-2200 for information on who can help and more.

Natural Resources Conservation Service (NRCS)

Environmental Quality Incentives Program

Purpose: The Environmental Quality Incentives Program (EQIP) is a voluntary program authorized under the Agricultural Act of 2018 that helps landowners install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and forest lands. Funding toward conservation work is competitive, with priorities decided by local NRCS field offices. Forest work through NRCS can include items such as forest thinning projects and riparian restoration.

Who Can Apply: Landowners of "non-industrial" forestlands and/or agricultural producers; Tribes and Pueblos.

Amount: Varies. Reimbursements are made after the practice is complete and approved.

Match Amount: Match is not a requirement; however, often in-kind matches are needed, and/or additional funds are sometimes needed based on practice, location, and market rates.

Deadline: Applications accepted throughout the year with decisions generally made early in the year.

Contact: Your local NRCS office. Every county in New Mexico has a field office (except for Los Alamos). Visit the NRCS New Mexico website for contact information or call 505-761-4400. Additionally, locate your Local Service Centers at https://www.nrcs.usda.gov/wps/portal/nrcs/main/nm/contact/local/

For More Information: www.nrcs.usda.gov/wps/portal/nrcs/main/nm/programs/financial/eqip/

Conservation Stewardship Program

Purpose: The Conservation Stewardship Program (CSP) is a voluntary conservation program through the Natural Resources Conservation Service that encourages producers to address resource concerns in a comprehensive manner by (1) undertaking additional conservation activities, and (2) improving, maintaining, and managing existing conservation activities.

Who Can Apply: CSP is available on Tribal/Pueblo and private agricultural lands and "nonindustrial" private forestland.

Amount: Varies based on improvements and acreage.

Match Amount: Not required.

Deadline: Applications accepted throughout the year with decisions generally made early in the year (around February).

Contact: Your local NRCS office. Visit the NRCS New Mexico website for local contact information or call 505-761-4400. Additionally, locate your Local Service Centers at https://www.nrcs.usda.gov/wps/portal/nrcs/main/nm/contact/local/

For More Information: www.nrcs.usda.gov/wps/portal/nrcs/main/nm/programs/financial/csp/
Regional Conservation Partnership Program

Purpose: The Regional Conservation Partnership Program (RCPP) promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance through partnership agreements and program contracts or easement agreements. The process of developing RCPP agreements includes prioritizing conservation issues, identifying the best solutions and developing outreach plans.

Who Can Apply: Agricultural or silvicultural producer associations, farmer cooperatives or other groups of producers, state or local governments, American Indian tribes, municipal water treatment entities, water and irrigation districts, conservation-driven nongovernmental organizations, and institutions of higher education.

Amount: Varies.

Match Required: Yes. Proposals with high amounts of match are more competitive.

Deadline: Determined annually by USDA NRCS, and typically announced on national NRCS web site, in state news releases, and published on Grants.gov.

Contact: Your local NRCS office. Visit the NRCS New Mexico website or call 505-761-4404. Additionally, locate your Local Service Centers at
https://www.nrcs.usda.gov/wps/portal/nrcs/main/nm/contact/local/

For More Information: www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp

Soil and Water Conservation Districts

Soil and Water Conservation Districts often have programs and grants for landowners. Since programs are dependent on funding and vary, contact your local SWCD. To find your local SWCD, call the New Mexico Association of Conservation Districts at (575) 9812400 or the New Mexico Coalition of Conservation Districts at 505-832-1111. For a list of districts and phone numbers, visit http://www.nmacd.org/swcds.

Forest Stewardship & the American Tree Farm System

You do not need to be a “tree farmer” (i.e. producing trees for production or sale) to benefit from the American Tree Farm System. In New Mexico, the program focuses on forest stewardship by private landowners, working to give people the tools they need to be effective stewards of America's forests. If you are interested in a stewardship plan or additional resources (and recognition) for actively managing your forest, this system has a lot to offer!

Find out more at https://www.treefarmsystem.org/or contact your local New Mexico State Forestry office. For the NMSF office near you, visit http://www.emnrd.state.nm.us/SFD/contact.html or call 505 476-3325.

Other Resources

- **Local Contractors** can also assist you with managing your forestland, from writing plans and conducting inventory to helping you understand the local forest industry.
- **Community Groups** such as watershed associations or land alliances may provide resources to landowners.
- **Non-Profit Groups** such as the Forest Guild provide information for private landowners.

Feel free to Contact Todd Haines 505 934-1033 or Todd_Haines@hotmail.com with questions regarding the management of your forest. I will assist (no charge) with getting you going in the right direction. Also seriously consider becoming a New Mexico Tree Farm certified property. This will also serve to provide NO CHARGE access to participating foresters.