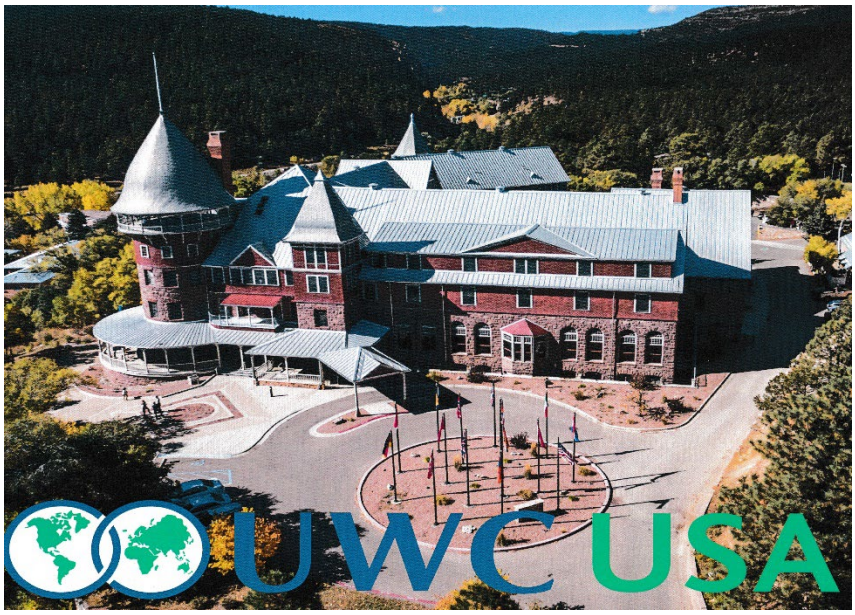
United World College
Forest Stewardship Plan



Prepared by:
Todd Haines CF

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Section I. Overall Property Information

Landowner Contact Information

Name: United World College Montezuma Campus Property

Address:
United World College-USA
PO BOX 248
Montezuma, NM 87731

Phone #: (505) 426-3391

Tree Farm NUMBER: N/A

Email Address: Bob Nash - Senior Director of Operations and Safety

County: San Miguel

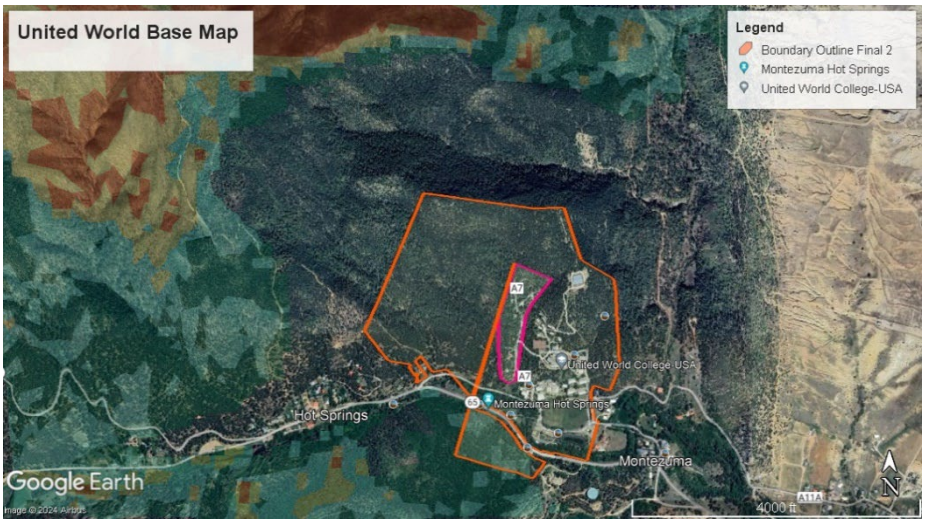
Legal Description: Section: 31 Township: 17 Range: 16 WEST A NM Meriden

Centroid of Property: (Listed in decimal Degrees)

- **Latitude** | 35.655294 N
- **Longitude** | -105.281713 W

Acreage / Range in Elevation: Approximately 231.72 total acres / 6,130-7,274 feet MSL

Ownership description and history



This approximately 231.72-acre property is located in the town of Montezuma, which is an unincorporated community in San Miguel County, New Mexico. It is located about five miles northwest of the city of Las Vegas, New Mexico. Access to the property gate from I-25 is by taking exit 343 onto I-25 Business Loop (N Grant Ave) towards Las Vegas. Turn left onto NM-329 and head north. NM-329 will turn into Church St. Turn left onto NM-65 (Hot Springs Blvd) and continue to head north. At the town of Montezuma, bear right onto Campus Dr (unpaved) and continue past the Armand Hammer World College USA entrance onto county road A11A which will swing north then easterly to the Land Grant property locked steel swing gate.

An internet search for the small community of Montezuma yielded a Wikipedia article titled "Montezuma, New Mexico" which states: Montezuma is an unincorporated community located about five miles northwest of the city of Las Vegas, New Mexico. The town was best known for many years for its natural hot springs and was in fact called "Los Ojos Calientes" or "Las Vegas Hot Springs" until the late 19th

century. The town consists of ranches, a post office, and the United World College-USA.

Another internet search for the United World College yielded a Wikipedia article titled “Armand Hammer United World College of the American West” which states: “UWC-USA (legally named the Armand Hammer United World College of the American West) is a United World College founded in 1982 by industrialist and philanthropist Armand Hammer”. It is a two-year, independent, co-educational boarding school accredited by the Independent Schools Association of the Southwest with about 230 students representing 70-80 countries at any time. Students are between 15 and 19 years old, and the majority receive full or partial scholarships. They are selected from 155 National Committees that represent the United World Colleges around the globe. Students graduate with the full International Baccalaureate Diploma, one of the most respected secondary diplomas in the world.

The Armand Hammer Foundation purchased the property to establish a United World College in the United States in 1981. Major renovations of existing buildings preceded the school’s opening in the fall of 1982, an event that was attended by HRH Prince Charles, president of the United World Colleges movement. The school's founding president was Theodore D. Lockwood, who served from 1982 until 1993. Philip O. Geier served as president from 1993 until 2005, when he passed the reins to Lisa A. H. Darling, whose presidency ended in 2013. The school's fourth president is Dr. Mukul Kumar '89, an alumnus and leader in international education.

The Montezuma Castle, now the Davis International Center, houses student and faculty residences, classrooms, seminar rooms, and offices, in addition to the student center, college dining facility, and the Bartos Institute for the Constructive Engagement of Conflict.

The Old Stone Hotel (OSH), the first hotel opened in Montezuma (as the Hot Springs Hotel) was renovated in 1981 to serve as the administration building, until the restoration of Montezuma Castle was completed.

Landowner goals and objectives

Goal 1 – Provide for appropriate wildfire protection in this fire adapted ecosystem.

- **Objective 1.1** – Ensure that the property is kept in a natural state while minimizing the hazard presented by high density forest.
- **Objective 1.2** – Provide defensible space to structures and other improvements on the property.
- **Objective 1.3** – Utilize Firewise standards to better withstand wildfire threats.

Goal 2 – Part of the Gallinas watershed; enhance and maintain riparian areas on the property, specifically those with riparian species such as narrow leaf cottonwood stands.

- **Objective 2.1** - review low water crossings for actual or potential downstream sedimentation.
- **Objective 2.2** – ensure the health of the narrow leaf cottonwood stands land including other existing riparian species in and around the riparian areas.
- **Objective 2.3** - look for opportunities to increase health of riparian areas.

Goal 3 – Implement forest treatments and activities that improve habitat for key indicator wildlife species and serve to protect from forest insect and disease issues.

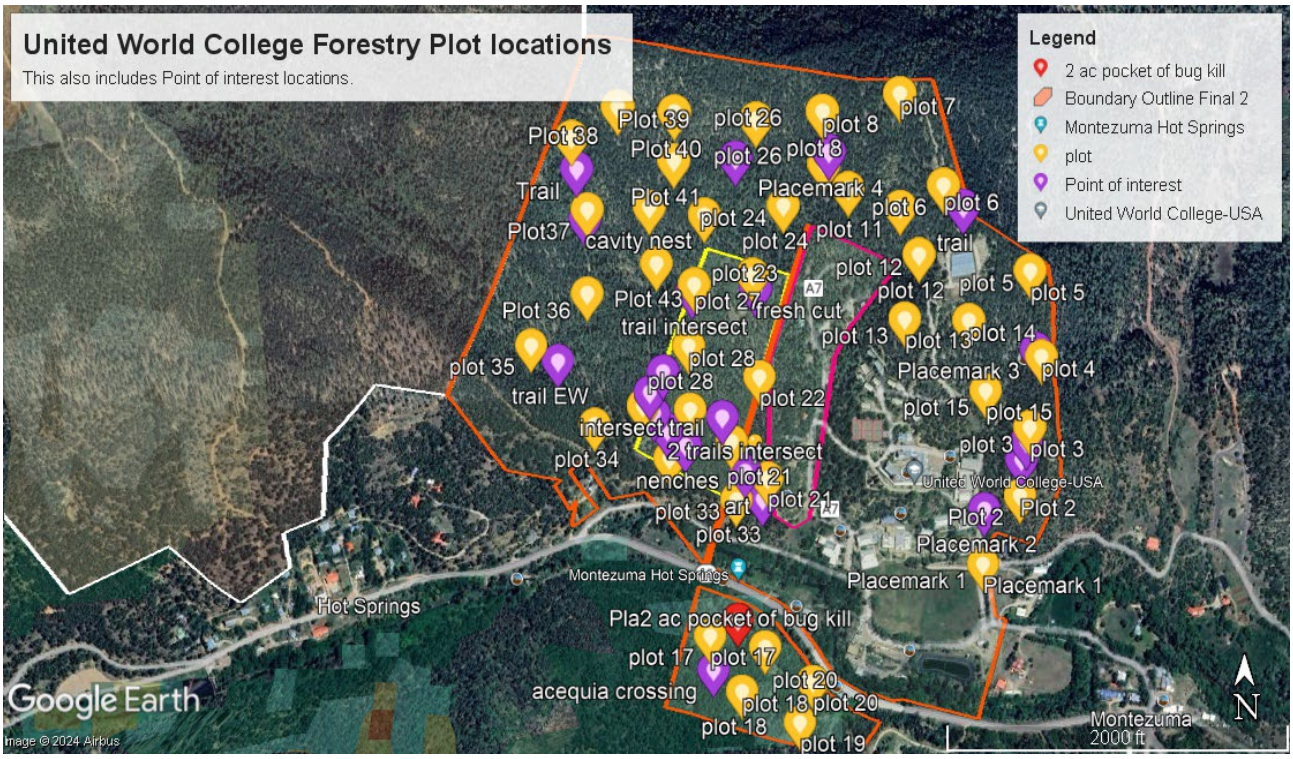
- **Objective 3.1 -** Ensure any insect and disease issues within the stands of trees are under control and within natural conditions.
- **Objective 3.2** - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing for wildlife habitat and browse.
- **Objective 3.3** - where feasible, adjust thinning guidelines to the needs of a particular wildlife species.
- **Objective 3.4** - explore opportunities to develop water sources for the use of wildlife on the property.

Goal 4 – Provide recreational opportunities on the property. Enhance the aesthetic quality of the property.

- **Objective 4.1** – Perform forestry practices that will provide aesthetic beauty.
- **Objective 4.2** – Develop the property for use as a recreational landscape fitting in with the site plan and the UWC objectives for the use of the campus.
- **Objective 4.3** – Ensure the long-term use of the property serves to enhance the forest while providing for the enjoyment of recreational use by scouting groups and similar organizations.

Goal 5 – Continue to develop a comprehensive property map showing existing roads, existing thinning, future management areas, approximate property line locations and ownership and past uses. This goal will become the "existing condition" within the Stewardship Plan and provide a planning baseline for future forest management and treatment objectives.

- **Objective 5.1** - identify future management areas that can be accessed by roads. Identify potential benefits or negative impacts.
- **Objective 5.2** - sample existing thinning and develop a multiple year action plan.
- **Objective 5.3** - review existing roads; recommend best management practices and maintenance procedures to limit actual or potential erosion.



Section II. Resource Descriptions

General Description

The terrain on the property is generally mountainous with slopes averaging between 20% to steeper slopes of 60%+ with several rocky cliffs facing north to east. Pinyon pine (Pinus edulis), one-seed juniper (Juniperus monosperma) and Rocky Mountain Juniper (Juniperus scopulorum) woodland timber type located on the very southern part of the property and on some southerly aspects. Most of the property is in Ponderosa Pine (Pinus ponderosa) or Pinon pine (Pinus edulis) "Ponderosa Pine is an indicator of the Transition Zone, a mid- elevation region where the aridity of the grassland and the shrubby desert yields to a cooler and moisture climate" (Ecology of Western Forests; 150).

Gambel oak (Quercus gambelii) occurs in the understory mostly as a shrub and in scattered small motts on most of the property at the lower elevations. Narrow leaf Cottonwood (Populus angustifolia) occurs in drainages with perennial streams and in moister intermittent stream locations.

Fish and Wildlife Habitat with Key Species

The following examples of species commonly found on the property come from personal observation and a database query using the http://bison-m.org/ internet site for San Miguel County. Complete lists can be found in the Appendix E under Fish and Wildlife Habitat Reports for San Miguel County.

Characteristic tree species found in this habitat type are ponderosa pine, (*Pinus ponderosa*); one seed juniper, (*Juniperus monosperma*); Rocky Mountain juniper, (*Juniperus scopulorum*); and Gambel oak in tree form, (*Quercus gambelii*).

Characteristic shrub species found in this habitat type include true mountain-mahogany *(Cercocarpus montanus*), Gambel oak in shrub form, (*Quercus gambelii*), kinnikinnick (*Arctostaphylos uva-ursi*), and common snowberry (*Symphoricarpos albus*). I found a wild rose growing in the bottom of an intermittent stream and identified it as Woods Rose also known as Common Wild Rose or Mountain Rose (*Rosa woodsii*).

Woods Rose (Rosa woodsii)

Characteristic grass species found in this habitat type include:

Common Name	**Scientific Name**
Fernald's bluegrass	*Poa laxa fernaldiana*
side oats grama	*Bouteloua curtipendula*
blue grama	*Bouteloua gracilis*
prairie junegrass	*Bouteloua curtipenendula*
Arizona fescue	*Festuca arizonica*
mountain muhly	*Muhlenbergia montana*
little bluestem	*Schizachyrium scoparium*
muttongrass	*Poa fendleriana (Steud.) Vasey*
sedge	*Family - Cyperaceae*
Danthonia	*Genera - Danthonia*
Needlegrass	*Genera - Stipa*
California or mountain brome	*Bromus carinatus*
western wheatgrass	*Pascopyrum smithii*
spike muhly	*Muhlenbergia glomerata*

The above species are indicative of healthy woodlands and ponderosa pine habitat. The quality of the habitat is also measured by the presence of indicator species. These are the wildlife species whose presence is indicative of a healthy habitat. Some of the indicator animal species for this habitat type are as follows.

Birds

- Red tailed hawk (*Buteo jamaicensis*)
- Bushtit (*Psaltrparus minimus*)
- Hepatic Tanager (*Piranga rubra*)
- Black Chinned Hummingbird (*Archilochus alexandri*)
- Turkey Vulture (*Cathartes aura*)
- Woodhouse's Scrub Jay (*Aphelocoma woodhouseii*)
- Common Raven (*Corvus corax*)
- Golden Eagle (*Aquila chrysaetos*)
- Great Horned Owl (*Bubo virginianus*)
- Black Headed Grosbeak (*Pheucticus melanocephalus*

Common Raven
(Corvus corax)

Turkey Vulture
(Cathartes aura)

Mammals

- Abert Squirrel (*Sciurus aberti*)
- Colorado Chipmunk (*Eutamias spp*.)
- Ringtail (*Bassariscus astutus*)
- Coyote (*Canus latrans*)
- Striped Skunk (*Mephitis mephitis*)
- Mule Deer (*Odocoileus hemionus*)
- Mountain Lion (*Felis concolor*)
- Western Brush Rabbit (*Sylvilagus bachmani*)
- Black Bear (*Ursus americanus*)
- Elk (*Cervus Canadensis*)

Abert Squirrel *(Sciurus aberti)*

Elk *(Cervus Canadensis)*

Reptiles

- Collared Lizard (*Crotaphytus collaris*)
- Western Rattle Snake (*Crotalus viridis*)
- Short Horned Lizard (*Phrynosoma douglassi*)
- Bull Snake (*Pituophis elanoleucus*)

Bull Snake *(Pituophis elanoleucus)*

Threatened, Endangered, & State Sensitive Species

There are several threatened and endangered plant and animal species that are potentially found in the habitat type for this area. The following table comes from a database query using the http://bison-m.org/ internet site for San Miguel County.

Species	Scientific Name	Type	NMGF	USFWS	Critical Habitat
Pacific Marten	*Martes caurina*	Mammal	T		
White-tailed Ptarmigan	*Lagopus leucura*	Bird	E		
Brown Pelican	*Pelecanus occidentalis*	Bird	E		
Common Black Hawk	*Buteogallus anthracinus*	Bird	T		
Bald Eagle	*Haliaeetus leucocephalus*	Bird	T		
Peregrine Falcon	*Falco peregrinus*	Bird	T		
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Bird	T		
Least Tern	*Sternula antillarum*	Bird	E	E	
Yellow-billed Cuckoo (western pop)	*Coccyzus americanus occidentalis*	Bird		T	
Boreal Owl	*Aegolius funereus*	Bird	T		
Mexican Spotted Owl	*Strix occidentalis lucida*	Bird		T	Y
Broad-billed Hummingbird	*Cynanthus latirostris*	Bird	T		
White-eared Hummingbird	*Hylocharis leucotis*	Bird	T		
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Bird	E	E	Y
Gray Vireo	*Vireo vicinior*	Bird	T		
Sprague's Pipit	*Anthus spragueii*	Bird		C	
Baird's Sparrow	*Ammodramus bairdii*	Bird	T		
Suckermouth Minnow	*Phenacobius mirabilis*	Fish	T		
Arkansas River Shiner (Native pop.)	*Notropis girardi*	Fish	E	T	Y
Paper Pondshell	*Utterbackia imbecillis*	Mollusk	E		
Lake Fingernailclam	*Musculium lacustre*	Mollusk	T		
Long Fingernailclam	*Musculium transversum*	Mollusk	T		

The Biota Information System of New Mexico (BISON-M) was developed for biologists by The New Mexico Department of Game & Fish, and The Fish & Wildlife Information Exchange (Conservation Management Institute, VA Tech Blacksburg, VA). Other contributing agencies include Natural Heritage New Mexico (a division of UNM's Museum of Southwestern Biology), US Army Corps of Engineers, US Bureau of Land Management, US Bureau of Reclamation, US Fish and Wildlife Service, US Forest Service, and New Mexico State Land Office.

BISON-M contains accounts for all vertebrate and many invertebrate species of wildlife occurring in New Mexico and Arizona (including all threatened, endangered and sensitive species). Many accounts are incomplete although new information is being added continuously. Errors do occur. Users are cautioned to refer back to the original cited source to assess completeness and correctness before using the information.

There are sixteen bird species, one mammal, two fish, and three mollusk species identified as threatened, endangered or potentially listed as candidate species potentially found in this habitat type.

During my field reconnaissance, I observed one Aberts squirrels (*Sciurus aberti)* in a grove of older narrow leaf cottonwoods along the perennial stream located on private property that diagonally divides the land grant property. I also had two close observations of either the same red tail hawk (*Buteo jamaicensis*) or a pair of nesting red tail hawks in the same drainage. Neither species is found on the Threatened, Endangered or Potential (Sensitive) list.

Red Tailed Hawk (*Buteo jamaicensis)*

State Wildlife Action Plan for New Mexico

New Mexico is the fifth largest state in the US and one of the top five most biologically Diverse. New Mexico's terrestrial and aquatic ecosystems support 3,783 species of vascular plants (Allred and Ivey 2012) and over 6,000 species of animals (www.bison-m.org/).

Wildlife can be adversely affected throughout the State by not only climate change, but human activity as well particularly through land uses that degrade or eliminate wildlife habitat. As a result, some species populations may decline enough to jeopardize their continued existence. If this happens, it could result in the species being considered for listing as Threatened or Endangered through the New Mexico Wildlife Conservation Act or federal Endangered Species Act.

The State Wildlife Action Plan (SWAP) represents the 2016 revised assessment of New Mexico's wildlife and their habitats by the New Mexico Department of Game and Fish. It is based on a review and revision of the 2006 Comprehensive Wildlife Conservation Strategy for New Mexico (CWCS). Both the CWCS and SWAP are non-regulatory planning documents that rely on the best available science, including the expert opinion of Department biologists, to provide a high-level view of the needs for and opportunities to conserve New Mexico's wildlife and their habitats. It looks at the variety of species and the range of habitats, their status, potential threats or constraints, and potential conservation actions to keep species secure. By synthesizing this information, the Department hopes to provide conservation practitioners with a document that can help them to recognize needs, identify opportunities, and develop actions that can help conserve and enhance wildlife populations and their habitats in New Mexico. This document also qualifies the Department to participate in the US Fish and Wildlife Services State Wildlife Grants (SWG) Program.

New Mexico's size and biodiversity make conservation planning and implementation on a statewide basis

impractical. To resolve this, Level II ecoregions mapped in Griffith et al. (2006) were selected to focus conservation strategies within six specific ecoregions. The United World College is in the Southern Rocky Mountains ecoregion. Thirty- nine terrestrial habitats were delineated within ecoregions and grouped into eight categories. The United World College is located within the Rocky Mountain Lower Morane Forest terrestrial habitat. The State Wildlife Action Plan can be found in Appendix D.

Rare plants

A search of the rare plants database found on the University of New Mexico website produced four rare plants that have been found located in San Miguel County. The website: http://nmrareplants.unm.edu/ is available to everyone. A complete New Mexico State Endangered Species List is found in Appendix A. The list and description of the four rare plants by scientific name found in San Miguel County are as follows:

Calochortus gunnisonii var. perpulcher

Family: Liliaceae

Scientific Name: *Calochortus gunnisonii* S. Watson var. *perpulcher* Cockerell

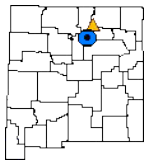
Synonyms: None

Vernacular Name: Pecos mariposa lily

R-E-D Code: 2-1-3

Description: Erect perennial herbs, from ovoid bulbs, stems slender, usually one per bulb, 2-6 dm tall, bearing a few long, narrow leaves and 1-3 flowers at the apex; flowers 3-merous, large, bell-shaped, erect; sepals lanceolate, 2-3 cm long; petals obovate, pale yellow, 3-4 cm long and 2-3 cm wide, each with an interior basal gland surrounded by golden hairs that branch at the tips; capsules linear-oblong, acute, 3-angled. Flowers late July and August.

Similar Species: *Calochortus gunnisonii* is the only species of mariposa lily in the Sangre de Cristo Mountains. Variety *gunnisonii* also occurs in these mountains and is distinguished by its white, pale purple, or dark purple petals.



Distribution: New Mexico, southwestern Mora, northwestern San Miguel, and southwestern Colfax counties; southeastern part of the Sangre de Cristo Mountains.

Habitat: Meadows and aspen glades in upper montane coniferous forest; 2,900-3,400 m (9,500-11,200 ft).

Remarks: This is hardly more than a color form of a variable species and needs further study. Yet it is difficult to find. Attempts to relocate the historical population on Hermit Peak have been unsuccessful.

Erigeron subglaber

Family: Asteraceae

Scientific Name: *Erigeron subglaber* Cronquist

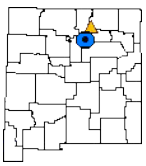
Synonyms: None

Vernacular Name: Pecos fleabane

R-E-D Code: 2-1-3

Description: Low perennial; stems 3-8 cm tall, nearly hairless; leaves to 6 cm long, sparsely hairy mostly along the margins; basal leaves broader above the middle; stem leaves smaller than the basal and often linear; flower heads solitary on each stem; involucral bracts smooth and often purplish at the tip; ray flowers 25-35, purplish or bluish; achenes 2-nerved, somewhat hairy; pappus of sordid capillary bristles. Flowers in August and early September.

Similar Species: *Erigeron leiomerus* differs in having glandular involucral bracts and generally broader leaves.



Distribution: New Mexico, northwestern San Miguel and Mora counties, Sangre de Cristo Mountains.

Habitat: Rocky, open meadows in subalpine coniferous forest; 3,050-3,500 m (10,000-11,500 ft).

Remarks: Narrowly endemic and sporadically distributed on some high ridges and peaks of the Sangre de Cristo Mountains. The largest known concentration of this species is on the Elk Mountain Ridge of the southern Pecos Wilderness.

Conservation Considerations: A radio tower and associated road have impacted one of the larger populations of this plant. Other known populations are in remote wilderness areas. Impacts of grazing, climate change and wildfires have not been studied.

Hackelia hirsute

Family: *Boraginaceae*

Scientific Name: *Hackelia hirsuta* (Wooton & Standley) I.M. Johnston

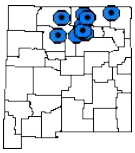
Synonyms: *Lappula hirsuta* Wooton & Standley

Vernacular Name: New Mexico stickseed

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

Description: Biennial herb; stems one or a few, 2-6 dm tall, covered with appressed and somewhat spreading hairs; leaves hairy, those at base of plant oblanceolate, withering early, 2-7 cm long, stem leaves lanceolate or oblong 3-10 cm long; inflorescence a coiled cyme in flower, then much elongating in fruit, fruiting flowers nodding downward, most flowers subtended by small leaf-like bracts 3-10 mm long; flower petals united into a short tube and spreading 5-lobed limb; corolla 4-8 mm in diameter, blue on limb and white in center, throat of corolla tube with 5 minutely hairy appendages (fornices); nutlets usually 4 per flower (sometimes fewer by abortion), nutlet margins armed with a single row of prickles with small branching hooks at the tips, dorsal surfaces of nutlets papillate,without additional prickles. Flowers July and August.

Similar Species: Differs from the annual *Lappula redowskii* by its biennial habitat and nodding fruits. *Hackelia besseyi* is also very hairy, but is a slender plant with flowers that are only 1 or 2 mm in diameter and only a few inflorescence bracts at the bases of the cymes. *Hackelia floribunda* is less hairy and has shorter, naked cymes (no bracts).



Distribution: New Mexico, Colfax, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, Taos, and Union counties, Jemez Mountains, Canjilon Mountains, southern Sangre de Cristo Mountains, and Capulin Volcano.

Habitat: Dry sites of shaley or igneous soils in lower to upper montane coniferous forest, usually with Gambel oak; 2,350-3,100 m (7,700-10,200 ft).

Remarks: The flowers of this plant are clear blue. The larger-flowered forms are attractive.

Conservation Considerations: Distribution is sporadic and local populations are not large. The species often occupies roadcuts or excavations that expose mineral soils. It is not significantly threatened by common land uses within its habitat

Ipomopsis sancti-spiritus

Family: Polemoniaceae

Scientific Name: *Ipomopsis sancti-spiritus* Wilken & Fletcher

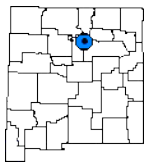
Synonyms: None

Vernacular Name: Holy Ghost ipomopsis

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

Description: Biennial to short-lived monocarpic perennial, erect, 3-8 dm tall; stems mostly solitary, occasionally branched from the base; basal leaves in a rosette, senescent at flowering; basal leaves ovate in outline, 3-5 cm long, pinnatifid in 9-15 linear divisions, 3-11 mm long; stem leaves gradually reduced in size; inflorescence a terminal and 6-11 lateral cymose clusters, restricted to the upper half of the stem, the lateral cymes 5-50 mm long when in fruit; calyx 5-6 mm long, cylindrical, 5-lobed, the lobes 1-2 mm long; corolla pink, tube 15-18 mm long, subsalverform, 5-lobed, the lobes spreading to slightly reflexed, 6-8 mm long, 3-4 mm wide; stamens 5; anthers and stigma included; fruit a capsule. Flowers July to September.

Similar Species: As a rosette, this species is indistinguishable from *Ipomopsis aggregata* ssp. *formosissima* (skyrocket), which grows in the same habitat, but has red-orange flowers with anthers and stigma exserted beyond the throat of the corolla tube. There are four other ipomopsis with pink flowers in New Mexico. *Ipomopsis longiflora* and *I. pumila* are both annuals less than 3 dm tall. *Ipomopsis aggregata* ssp. *candida* and *I. a.* ssp. *collina* are perennials that match *I. sancti-spiritus* in height, but have corolla tubes 20-40 mm long.



Distribution: New Mexico, San Miguel County, found in only one canyon in the upper Pecos River drainage of the southern Sangre de Cristo Mountains.

Habitat: It grows on relatively dry, steep, west to southwest-facing slopes in open ponderosa pine or mixed conifer forest at 2,400-2,500 m (7,730-8,220 ft). The geologic substrate is partly weathered Terrero limestone.

Remarks: This plant appears to grow best in bare mineral soils with its highest densities on disturbed sites such as road cuts.

Conservation Considerations: The sole location for this plant is along a road to a campground in a canyon developed for summer homes. Road maintenance, recreation, and catastrophic forest fire are immediate management concerns. In the long term, present

land uses in the area influence management away from frequent disturbances that produce the early successional habitats to which this plant is best adapted.

Although the above species may reside within San Miguel County, they may or may not be present on the property.

Soil and water resources

A soil survey report was developed using the online tools provided by the Natural Resource Conservation Service (NRCS) website for this plan. The full soil report is included in Appendix B of this plan.

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

There are 8 soil complex types found on the property's "Area of Interest" (that includes some of the surrounding area). The table below lists these. The 5 soil types located on the property are further described below the table. A detailed Soil set of information from the NRCS Web Soil Survey is attached in Appendix B**:**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CO2	Colmor-Onava complex, fan remnants - MLRA70A.1	25.3	2.7%
HU1	Haplustolls-Ustifluvents-Riverwash complex, floodplains - MLRA 70A.1	66.8	7.1%
MG	Moreno-Brycan association, sloping	25.3	2.7%
PC	Partri loam, undulating	30.7	3.3%
Ph2	Philmont silt loam, plateau interfluves, gently sloping - MLRA 70A.1	59.9	6.4%
RG	Rocio-Dargol-Stout association, hilly	175.2	18.7%
RH	Rock outcrop-Haploborolls complex, very steep	552.0	59.0%
VG1	Vegocito and Gallinas soils, stream terraces - MLRA 70A.1	0.0	0.0%
Totals for Area of Interest		**935.3**	**100.0%**

The soils found on the property are as follows:

- **Soil 1 – HU Haplustolls-Ustifluvents-Riverwash complex, floodplains:** Map unit composition is Haplustolls and similar soils: 60 percent; Ustifluvents and similar soils: 25 percent; Riverwash:15 percent. *These soils are from 0 to 22 inches:* sandy loam, from *22 to 37 inches:* fine sandy loam and *37 to 79 inches:* stratified coarse sand to loamy coarse sand to gravelly loamy sand to sandy loam to gravelly clay loam. These soils are "Somewhat poorly drained" and have a runoff characteristic of low. The ecological site is riparian.

- **Soil 2 – MG - Moreno-Brycan association, sloping:** map unit composition is Moreno and similar soils ±45%, Brycan and similar soils ±35% with minor components of ±1%. Moreno soils are a loam from 0 to 12", a clay loam from 12 to 53" and a gravelly clay loam from 53 to 60". Slopes are generally 3 to 9%. These soils are well drained and have a very high run off rate. They are generally found on fan landforms, foot and side slopes and on linear slopes. Brycan soils are a loam from 0 to 4", a loam from 4 to 49" and a loam from 49 to 60". These soils are found in alluvial fans and valley floors and along toe slopes of 3 to 5% slope. They are also well drained with a runoff characteristic of low. Both of these soils ecological site vegetation is mountain grass.

- **Soil 3 – RG - Rocio-Dargol-Stout association, hilly:** the map unit composition is Rocio and similar soils ±35%, Dargol and similar soils ±25%, Stout and similar soils ±20% with minor components of ±1%. Rocio is a stony loam from 0 to 18" and clay from 18 to 60". It is located on mountain slopes including backslopes and mountain flanks. Slopes are linear with a 9 to 35% slope. Generally well drained with a runoff characteristic of very high. Dargol is a stony loam from 0 to 9", clay from 9 to 37" and bedrock from 37 to 47". It is located on mountain

slopes including backslopes and mountain flanks. Slopes are also linear with a 5 to 15% slope. Generally well drained with a runoff characteristic of very high. Stout is a cobbly sandy loam from 0 to 4", a cobbly sand loam from 4 to 10" and bedrock from 10 to 20". It is also located on mountain slopes including backslopes and mountain flanks. Slopes are convex with a 5 to 10% slope. Generally well drained with a runoff characteristic of very high. The ecological site vegetation is Pinyon pine, one- seed juniper and Gambel oak.

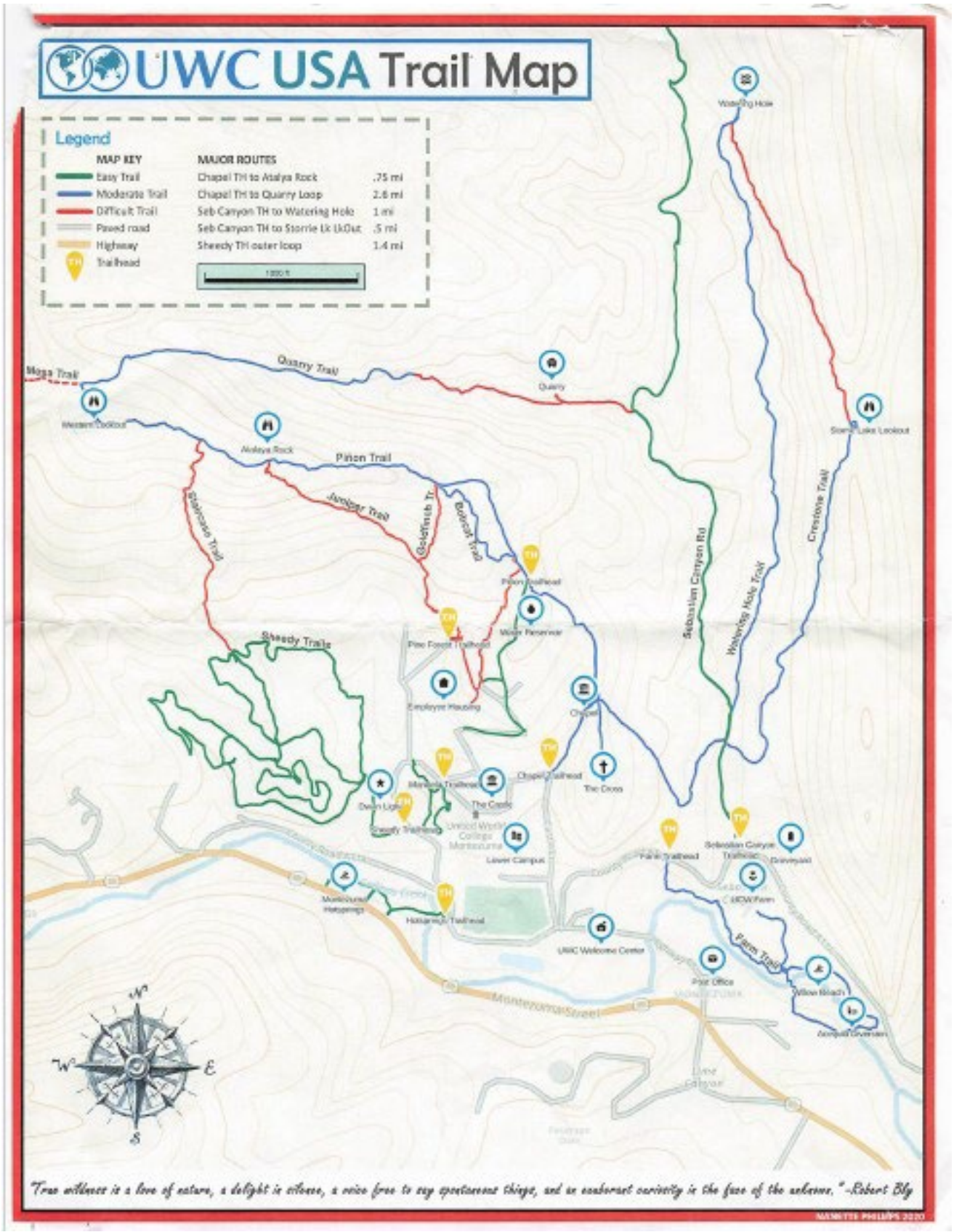
- **Soil 4 – RH - Rock Outcrop-Haploborolls Complex, very steep:** The map unit composition is rock outcrop ±50%, Haploborolls and similar soils ±40%. Rocky outcrops are 0 to 60" bedrock located on 30 to 75% slopes. The runoff characteristic is very high. Haploborolls soils are very stony loam 0 to 10", extremely stony fine sandy loam 10 to 41" and bedrock 41 to 60". These soils are located on mountain slopes including the backslope and mountain flanks. The slopes are linear with a 30 to 70% slope. These soils are generally well drained with a runoff characteristic of high. The ecological site vegetation is Ponderosa pine, Rocky Mountain juniper and Gambel oak.

- **Soil 5 – PC - Partri loam, undulating.** The map unit composition is Partri and similar soils 90 percent, minor components 10 percent. A typical profile is 0 to 4 inches: loam, 4 to 60 inches: silty clay loam. These soils are well drained with a runoff class of high. The ecological site is Clayey Uplands.

The soil types listed above are defined as woodland and mixed conifer forest that is primarily used for wildlife habitat and wood products. When projects are designed on these soils, referencing the appendix of this document is recommended.

Recreation and Aesthetic Resources

Opportunities for recreation are high for this property. Aesthetic qualities are also high. The highest elevation on the property is located in the most Northwestern corner, approximately 7320 ft in elevation. The property has a trail system that also links to adjacent properties. Currently some of the adjacent properties are not accessible as per the adjacent landowners. Others, however, can likely be accessed with some communication with the owners. Below is a trail map produced by the college.


UWC USA Trail Map
Legend
MAP KEY
Easy Trail
Moderate Trail
Difficult Trail
Paved road
Highway
Trailhead
MAJOR ROUTES
Chapel TH to Atalya Rock .75 mi
Chapel TH to Quarry Loop 2.6 mi
Seb Canyon TH to Watering Hole 1 mi
Seb Canyon TH to Storrie Lk LkOut .5 mi
Sheedy TH outer loop 1.4 mi
Mesa Trail
Quarry Trail
Western Lookout
Atalaya Rock
Pinon Trail
Juniper Trail
Goldfinch Tr
Bobcat Trail
Skidrose Trail
Sheedy Trails
Quarry
Storrie Lake Lookout
Sebastian Canyon Rd
Watering Hole Trail
Crestone Trail
Pinon Trailhead
Water Reservoir
Pine Forest Trailhead
Employee Housing
Chapel
Chapel Trailhead
The Cross
Main Trailhead
The Castle
Deer Light
Sheedy Trailhead
United World College Montezuma
Lower Campus
Park Trailhead
Sebastian Canyon Trailhead
Graveyard
Montezuma Hotsprings
Hotsprings Trailhead
UWC Welcome Center
Post Office
Farm Trail
Willow Road
Montezuma Street
N
E
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"True wilderness is a love of nature, a delight in silence, a voice free to say spontaneous things, and an exuberant curiosity in the face of the unknown." -Robert Bly

Section III. Timber Inventory with Forest Resource Assessment

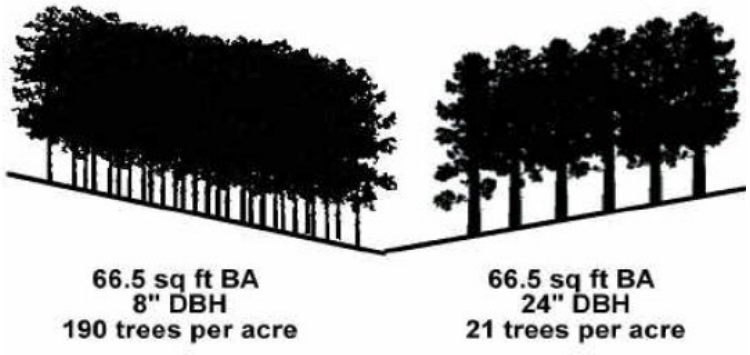
A property roads and boundary location with timber inventory and resource assessment was initially conducted on the property. The completed field report entitled “Reconnaissance and Cruise Report includes property maps, timber data sampling and analysis, and management considerations for the United World College Property”. The report can be found in Appendix F of this plan. In addition, a list of common forestry terms and definitions can be found in Appendix I.

Consolidated Property Map

Google Earth Pro was used as a primary mapping tool to consolidate The end product is a consolidated property map that shows all existing thinned units, mapped roads and a majority of boundary lines and corner monuments easily found on the property. The mapped boundary line and corner locations were extrapolated along with past licensed surveys and placed on the final Google Earth consolidated property map. The property line locations are approximate and should be used only for informational purposes.

Forest Resources and Inventory

A 10 BAF (Basal Area Factor) prism was used to collect variable plot information. Plot "In" trees were placed into 2-inch diameter classes and recorded by species. The forestry measurement of basal area is the amount of square feet (ft^2) of a tree per acre. Basal area is derived from a diameter measurement; for woodland species, the diameter measurement is taken and recorded as "diameter at root collar". For “traditional” commercial species such as Ponderosa pine, the diameter measurement is taken and recorded as "diameter at breast height” or 4.5 ft from ground level. Typically, in woodland forests, a rule of thumb is to have 40- 60 ft^2 of basal area per acre. This allows trees on average to grow at their optimal rate.



Note that it takes more smaller trees to equal the same Basal area as fewer larger trees.

The following data summery tables were calculated using an Excel Spreadsheet provided for use on NRCS and State Forestry projects:

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

Basal area (BA) is a measurement of the amount of tree area in square feet per acre that exist on the land. An acre consists of 43,560 square feet so a BA of 60 ft^2 (example) per acre of trees is what should exist.

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

Different ideal stocking levels can be used to accomplish different forest goals such as the best stocking for fire safety or the optimal timber production stocking level, getting big trees in the shortest period of time while keeping an optimal number of trees in the stand.

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

Forty-three total forest Inventory plots on the property. These were somewhat spatially distributed throughout the property while retaining a random nature to the plot locations. The Map below shows the plot locations in yellow. (The Purple location markers are point of interest). From the data collected the two tables to the right summarize some of the key forestry components for the property's timber stands. **Table 1** shows the number of total trees recorded in the plots and distributed them into size classes. The Size classes are Saplings (SAPS); Pole Timber (PT); and Saw Timber (ST). On the plots 24 Saplings were recorded, 155 Pole size trees were recorded, and 149 Saw Timber Size trees were recorded. These totaled 328 total trees. (A variable plot cruise using a 10 Basal Area Factor was used and this does use a measurement that tends to record larger trees on purpose to best calculate Basal Area). The Forest overall stand Basal Area averaged 76.28 Square feet per acre. This calculation will be addressed in the recommendations section for this plan. The above table does break down the Basal area by each size class of tree.

	BASAL AREA			
	SAPS	PT	ST	TOTAL
= Tallied	24	155	149	328
X BAF	10	10	10	10
÷ No Pts	43	43	43	43
BA / AC	5.58	36.05	34.65	76.28
AVE VOL				

Table 1 Basal Area summary

Table 2 shows the Basal area per size class (again as in table 1) and the corresponding Trees per acre by size class. (Note the basal area is a key in the calculation of Trees Per acre). These data show that, again, the overall Basal Area is 76.28 square feet per acre and the corresponding Trees per acre TOTAL is approximately 213. (Keep in mind the distribution of the trees throughout the size classes as a function of their basal area is used in determination of the overall Trees Per Acre (TPA). The final important calculation is the (QMD or QDM) Quadratic Mean Diameter of the stand tree diameter. This calculation gets an average tree size in a stand while eliminating the bias of outliers in the data. Large or small tree sizes will not play a large factor in determining the average. This makes the data very relevant and usable to best make decisions.

	AVERAGE DIAMETER			
	SAPS	PT	ST	TOTAL
BA / AC	5.58	36.05	34.65	76.28
÷ TREES / AC	72.2	106.9	33.6	212.7
÷ .005454				65.8
SQ RT				
AVG DIA (QDM)				8.1

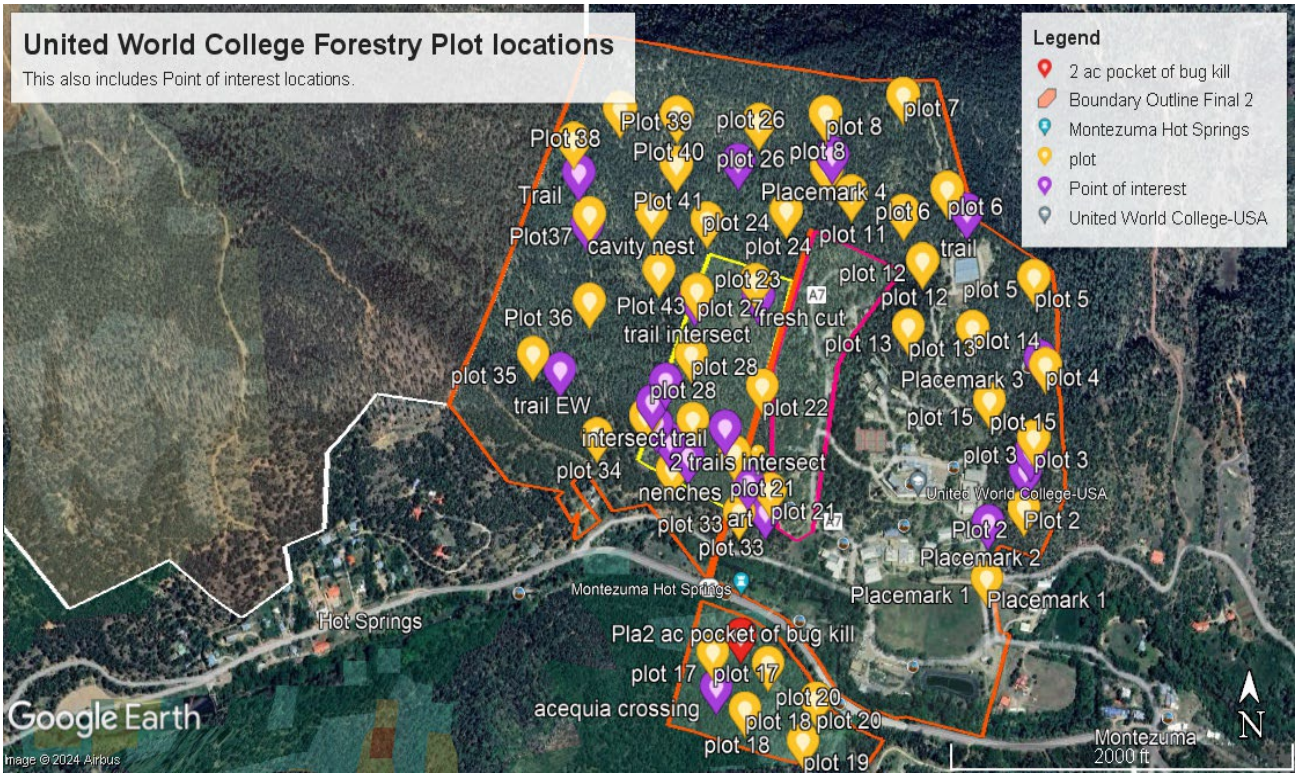
Table 2 Average Diameter summary

BASAL AREA PER TREE (SQ FT)

DBH	BA	DBH	BA	DBH	BA
6"	.20	24"	3.10	42"	9.60
8"	.35	26"	3.70	44"	10.60
10"	.55	28"	4.30	46"	11.50
12"	.79	30"	4.90	48"	12.60
14"	1.10	32"	5.60	50"	13.60
16"	1.40	34"	6.30	52"	14.80
18"	1.80	36"	7.10	54"	15.90
20"	2.20	38"	7.90	56"	17.10

This table shows the Diameter at Breast Height (DBH) or Diameter at Root Collar (DRC) sizes and the corresponding Basal Area.

Appendix F has the table of the plot data from the field inventory.



Section IV. Forest Protection

Forest Insects

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

Ips Gallery on a beetle killed tree.

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

Round headed and Flatheaded wood borer: The round headed and flat headed wood borer attack recently cut or dead or dying trees. This process, while not necessarily a detriment to the forest, can serve to damage harvested trees left in the forest for too long. These borers are most prominent after fires. They may also spread into vigas located in structures in the area. The best prevention to sustaining large populations of these borers is to ensure dead wood is removed and wood piles are dried out by solarizing the piles and eliminating breeding habitat found in the moist area between the bark and wood of logs. Solarizing is the process of placing plastic over freshly cut firewood to kill wood borers so they will not spread to healthy trees.

Western Cedar Wood Borer Galleries

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

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

Forest Disease

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

Dwarf Mistletoe: 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 overstory.

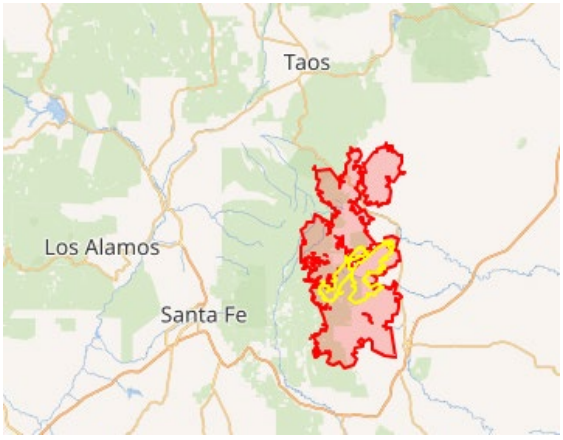
True Mistletoe

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

Fire

Fire History

The most notable fire occurrence in the area is the 2022 Hermits Peak fire that burned over 341,741 Acres in the vicinity of the United World College property. This was from the merger of the Calf Canyon and the Hermits Peak fires. This became the largest fire in New Mexico history. During the 2022 fire season nationwide this was the largest fire in the contiguous United States.



Yearly there are hundreds of wildfires in the state but very few have landscape level ramifications. The management of forests to encourage low intensity ground fires with minimal rates of spread should be a goal for forest properties. This

can be performed with fuels management (thinning).

Fire hazard

Directly relates to the amount of fuel available to burn in a fire. I estimate the majority of the fuel hazard on the property to be generally light to more moderate in locations such as on the steeper slopes of the property. Since the fire hazard directly relates to the amount of fuel available for consumption by a fire, fire hazard also addresses the arrangement of the fuel, i.e. the position of fuels in relation to other fuels. In recently thinned stands and many of the unmanaged Ponderosa pine stands, I judged the fuel hazard to be generally light. In some of the unmanaged steeper mixed conifer stands, the fuel hazards increase especially those that have insect and disease damage. In many of the unmanaged juniper/pinion stands such as those located in the diagonal private property piece and the property owned by the World College, the fuels are more moderate to heavy exacerbated by their relative positions to each other; oak understory with a juniper/pinion overstory that create fuel ladders.

Fire risk

This risk addresses the potential ignition sources for the area. Ignitions may be both human and natural caused. Human ignitions may be from neighboring homes, debris or prescribed burning, and other unforeseen person caused accidents. Lightning is one of the leading causes of natural ignitions.

Noxious Weeds

Invasive weeds pose a serious and increasing threat to New Mexico's environment and economy. These weeds are tough competitors and can spread rapidly, creating large stands that can persist for many years in the environment and cause many negative impacts to our ecosystems. While these impacts are species-specific, weeds have been documented to cause the following: displacement of native plants and animals, increased fire danger, increased soil erosion, increased flood severity, increased soil salinity, and decreased water quality. In agricultural and rangeland settings, these weeds can cause severe economic impacts by decreasing crop yields and lowering available forage for range animals, resulting in a decrease in livestock health.

New Mexico Noxious Weed List

http://www.nmda.nmsu.edu/apr/noxious-weed-information/

The following weeds have been selected by the New Mexico Department of Agriculture to be targeted as noxious weeds for control or eradication pursuant to the Noxious Weed Management Act of 1963. This list does not include every plant species with the potential to negatively affect the state's environment or economy. The publication, Troublesome Weeds of New Mexico, 2010 is found in Appendix C.

Class A

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

Class B

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*
Common teasel	*Dipsacus fullonum*

Halogeton	*Halogeton glomeratus*
Malta starthistle	*Centaurea melitensis*
Musk thistle	*Carduus nutans*
Perennial pepperweed	*Lepidium latifolium*
Poison hemlock	*Conium maculatum*
Russian knapweed	*Acroptilon repens*
Tree of heaven	*Ailanthus altissima*

Class C

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

Watch List species are of concern in the state and 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*
Pampasgrass	*Cortaderia selloana*
Quackgrass	*Elytrigia repens*
Sahara mustard	*Brassica tournefortii*
Spiny cocklebur	*Xanthium spinosum*
Wall rocket	*Diplotaxis tenuifolia*

Heritage Resources

A database search was performed through the State Historic Preservation Office website. No recorded sites were found (See Appendix G). If any artifacts (historic or prehistoric) such as several old can scatters, are found during management (thinning) activities, the immediate area in and around the site shall be protected by identifying on the ground with flagging and then protected through avoidance.

A cultural site is defined as a historic (50 years or older) to prehistoric (older than recorded history). Any sites found on the property should be egarded with care and all caution should be taken to avoid destruction of the site. Contact the SHiPO office or your local forester for advice on how to proceed with projects in any known or suspected location of a site.

Appropriate measures must be taken to avoid disturbing any sites during management activities, especially where federal dollars are spent.

Ecological Restoration

The paper, "Ecological Restoration of Southwestern Ponderosa Pine: A Broad Perspective (Appendix L) was adopted by the Cibola National Forest in 2003 as a new timber management direction from more traditional forestry practices where timber outputs were more important than the stands that were left. "The purpose of the paper is to promote a broad and flexible perspective on ecological restoration of Southwestern (U.S.) ponderosa pine forests.

Ponderosa pine forests in the region have been radically altered by Euro-American land uses, including livestock grazing, fire suppression, and logging. Dense thickets of young trees now abound, old-growth and biodiversity have declined, and human and ecological communities are increasingly vulnerable to destructive crown fires" (Craig Allen, etal. 2002).

The paper outlines 16 broad principles for restoration of Southwestern ponderosa pine forest ecosystems. These include:

1. Reduce the threat of crown fire (key). Initial treatments should be substantial enough to reduce the threat of stand replacement fires.
2. Prioritize and strategically target treatment areas (key). Priorities should be based on risk of crown fire, location near human development (values at risk) and important watersheds.
3. Develop site-specific reference conditions. Use historical ecological data to help prioritize treatment priorities.
4. Implement multiple conservation interventions. Multiple conservative restoration treatments are more desirable than using heavy handed treatments that can be more disruptive than helpful.
5. Utilize existing forest structure. Restoration treatments should build on existing stand structure such as large trees or groups of trees that have interlocking crowns.
6. Restore ecosystem composition. Fire suppression has allowed fire sensitive species such as juniper or white fir to become abundant in otherwise historical ponderosa pine stands. Treatments should discriminate against these species to restore dominance of fire-resistant ponderosa pine.
7. Retain trees of significant size or age. Pre Euro-American settlement trees are becoming rare and more importantly, difficult to replace. Their value due to size and structure complexity is critical to wildlife habitat. These trees provide a pool of future snags which are becoming increasing scarce in SW ponderosa pine forests.
8. Consider demographic processes. Studies show that restoration efforts should consider natural tree regeneration and mortality through the life of a given stand to establish ecosystem resiliency due to climate change. Integrate process and structure. Natural disturbances such as fire and insect outbreaks are irreplaceable shapers of the forest. Ecological restoration treatments should have a commitment to the restoration of episodic surface fires. Without this commitment, forest treatments cannot be considered "ecological".
9. Control and avoid using exotic species. Seeding with exotic grasses, forbs and shrubs should be prohibited. Once established, exotic species become difficult to impossible to remove.
10. Foster regional heterogeneity. The Southwest is complex in topography, hydrology and soils.

Biological communities as a result, vary at local and regional scales. Ecological restoration treatments should therefore also vary.

11. Protect sensitive communities. Certain ecological communities embedded within ponderosa pine forests, such as riparian areas should be protected against prescribed burning or mechanical treatments to avoid adverse affects.
12. Assess cumulative efforts. Cumulative impacts from restoration treatments should be considered. Craig Allen etal. 2002 doesn't specifically say to what level but I would recommend consideration to the watershed or large drainage level depending on frequency, size and severity of treatments.
13. Protect from overgrazing. Grass, forbs and shrub understories are essential to plant and animal diversity and soil stability.
14. Establish monitoring and research programs. Only through monitoring can the success or failure of the effects of ecological restoration be determined.
15. Implement adaptive management. Ecological restoration is a incremental process which may take a century or two to fully achieve. This requires a long-term commitment from land use managers.

Section V. Forest Management Recommendations

The New Mexico Statewide Resources Assessment, Strategy and Response Plan intends to guide long-term Forestry Division management, but as importantly, to provide useful information to our many partners who work together to create and maintain sustainable forests and their many benefits at: http://www.emnrd.state.nm.us/SFD/statewideassessment.html

The five primary landowner Goals and corresponding Objectives are relisted below with recommendations addressing these using information from the plan.

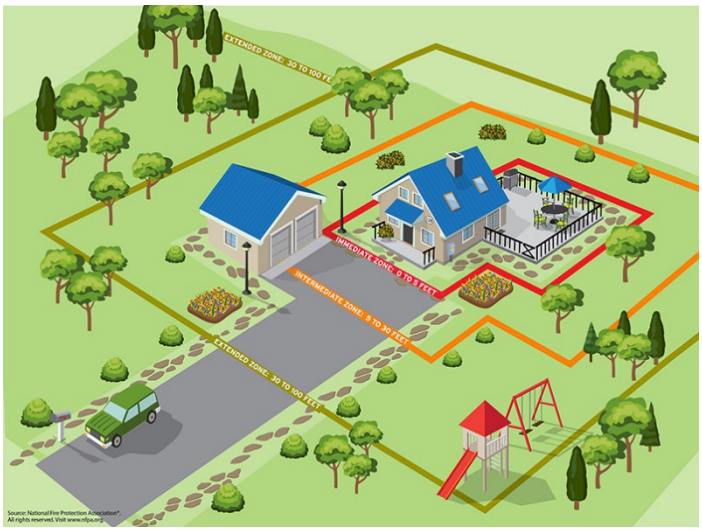
Goal 1 – Provide for appropriate wildfire protection in this fire adapted ecosystem.

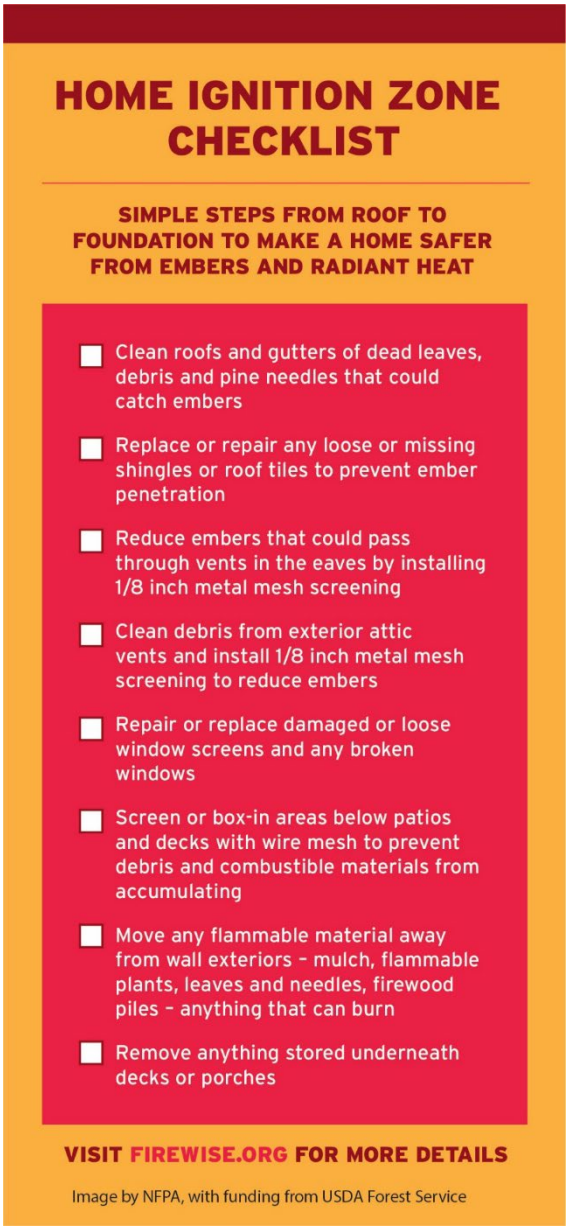
Objective 1.1 – Ensure that the property is kept in a natural state while minimizing the hazard presented by high density forest.

- It is recommended that where feasible the landscape stay forested and in a "Natural Range of Variability." This is a concept basically looks at a landscape over time and determines how changes occur. To keep the property in a "Natural State" while interjecting to minimize the (fuel) hazard the interjection should be focused on the lower end density of the range. A basal area of 20-70 Square feet per acre that varies in special distribution is the most ideal. This is also known to foresters as Patchy / Clumpy. However, for this specific property, 40 – 60 Square feet per acre as a residual Basal area is the preferred stocking. Spacing guides for this recommendation was purposely NOT included as it tends to skew the judgement of the Clumpy / Patchy distribution of the trees.

Objective 1.2 – Provide defensible space to structures and other improvements on the property.

- It is recommended that the above concept of a Natural Range of Variability is also used when providing for defensible space. Additionally, more specific Defensible space concepts should be strongly considered when deploying this practice. The diagram to the right shows several Home Ignition Zones and graphic samples of how to treat these.





HOME IGNITION ZONE CHECKLIST

SIMPLE STEPS FROM ROOF TO FOUNDATION TO MAKE A HOME SAFER FROM EMBERS AND RADIANT HEAT

- ☐ Clean roofs and gutters of dead leaves, debris and pine needles that could catch embers
- ☐ Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration
- ☐ Reduce embers that could pass through vents in the eaves by installing 1/8 inch metal mesh screening
- ☐ Clean debris from exterior attic vents and install 1/8 inch metal mesh screening to reduce embers
- ☐ Repair or replace damaged or loose window screens and any broken windows
- ☐ Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating
- ☐ Move any flammable material away from wall exteriors – mulch, flammable plants, leaves and needles, firewood piles – anything that can burn
- ☐ Remove anything stored underneath decks or porches

VISIT FIREWISE.ORG FOR MORE DETAILS

Image by NFPA, with funding from USDA Forest Service

Objective 1.3 – Utilize Firewise standards to better withstand wildfire threats.

Left is the Home Ignition Zone checklist from the Firewise Program. This primarily applies to structures within the threatened areas. A Firewise program is highly recommended for both the school structures as well as the private lands inside the school property. Some are externally owned but will be treated as one community when dealing with a wildland fire incident. A collaborative approach to becoming Firewise would serve the community.

Goal 2 – Part of the Gallinas watershed; enhance and maintain riparian areas on the property, specifically those with riparian species such as narrow leaf cottonwood stands.

Objective 2.1 - review low water crossings for actual or potential downstream sedimentation.

- Only one area was noted during the field inventory and that is the low paved road when entering the property from the east. The recommendation for this is to review this location and determine a better solution. The reason this is not more intimately included in this plan as it has the potential to be costly with significant trade offs when finding a solution.

Objective 2.2 – ensure the health of the narrow leaf cottonwood stands land including other existing riparian species in and around the riparian areas.

- **Gallinas Watershed Strategy and Wildlife Conservation**
  The following organizations provide partnership and funding opportunities to become involved in the greater Gallinas watershed:

  The New Mexico Watershed Collaborative Center is part of New Mexico Highlands University http://nmfwri.org/resources/collaboration/new-mexico-watershed-collaborative- center/gallinas . Their mission statement: "Improve the health and safety of the Gallinas and neighboring watersheds to mitigate the potential for catastrophic wildfire and to secure a more certain and sustainable water supply to the City of Las Vegas and the region through the development and implementation of a comprehensive and connected watershed plan and hazardous fuel reduction strategy". They further provide state-of-the-art information about forest and watershed restoration to the public, federal and state agencies, tribes, and private landowners in New Mexico.
  - Collaborates with citizen stakeholders, academic institutions, NGOs, and professional natural resources managers to establish a consensus concerning prescriptions and monitoring protocols for use in the restoration of forests and watersheds in an ecologically, socially, and economically sound manner.
  - Promotes ecological restoration and forest management efforts in ways that:
    - Keep New Mexican homes and property safe from wildfire.
    - Lead to a more efficient recharge of Mew Mexican watersheds
    - Provide local communities with employment and educational opportunities.

  Hermit's Peak Watershed Alliance at http://hermitspeakwatersheds.org/ is a 501(c)(3) nonprofit organization made up of residents in the Gallinas, Sapello, and Tecolote watersheds. Their organization is governed by a Board of Directors. They work with numerous other public and private organizations and individuals with an interest in our watersheds. Their mission statement: "is to foster land stewardship to ensure the long-term vitality of the human and natural communities of the Hermit's Peak region, specifically the Gallinas, Sapello and Tecolote watersheds". HPWA strives to address these needs by doing the following:

  - Identify the specific conditions and areas of degradation in our watersheds through investigation and monitoring.
  - Determine scientifically credible, practical, and effective means of restoring and maintaining healthy conditions.
  - Become personally familiar with landowners and managers in our watersheds to enable implementing restoration and management projects.
  - Acquire funding and expertise to implement restoration and management projects.
  - Offer and support watershed education for landowners, young people, the general community and government agencies that fosters a deeper watershed understanding.
  - Participate in collaborative watershed management efforts and encourage entities that affect land in our watersheds to do so with a healthy watershed perspective.

The Natural Resources Conservation Service – the Tierra y Montes Soil and Water Conservation District offers wildlife conservation grants through its partnership with New Mexico Game and Fish.

Goal 3 – Implement forest treatments and activities that improve habitat for key indicator wildlife species and serve to protect from forest insect and disease issues.

Objective 3.1 - Ensure any insect and disease issues within the stands of trees are under control and within natural conditions.

- Forest insects and diseases are ever present in the environment, it is possible, through active management to limit the negative effects of them. Thinning serves to perform this function. With a disease such as Dwarf Mistletoe the style of thinning comes into play. A "thin from above" system is recommended to reduce the presence of the disease while ensuring the rate of spread is not increased. Dwarf mistletoe spreads by shooting out "seeds" usually in the fall months to try to land on neighboring trees. If a stand is thinned from below the seeds have a greater chance of spreading farther than normal. Also, the trees that have the mistletoe higher up in their canopy have seeds that potentially shoot farther.

  The recommendation is to remove trees infected with mistletoe that are infected in the upper 2/3 ds of the canopy and if feasible remove all trees infected to eliminate as best possible the presence. This recommendation is usually resisted by forest owners but understanding the tradeoffs a longer-term decision may become more acceptable.

Objective 3.2 - where feasible, perform thinning and utilize the slash to add to the herbaceous and grass ground cover, providing for wildlife habitat and browse.

- Slash left on site creates microclimates that shelter understory vegetation. This practice is used and is very successful when managing for grass and forb ground cover. The trade off for using this practice is that the slash will create short term habitat (2-3 months) for bark beetle species that may build higher than normal populations. If surrounding tree are healthy with good soil moisture the beetle population has a reduced chance of being successful. The long-term tradeoff is excellent while the short-term risk of losing a few trees is possible.

  Another potential trade off is the increased "ground fuel" remaining on site. Ground fuel is much more desirable than having standing fuel when it comes to fire hazard. The "arrangement" is such that and fire is less risky and much easier to control. Woody debris on the forest floor is part of the natural process but it is also in conflict at times with fire hazard reduction.

  The recommendation is to utilize the practice of scattering slash on the forest floor in small discontinuous patches where increased promotion of grasses and forbs are desirable. This mitigates the risks while achieving overall forest goals.

Objective 3.3 - where feasible, adjust thinning guidelines to the needs of a particular wildlife species.

- The specific silvicultural practices chosen when thinning can have a great effect on the value of wildlife habitat in the area. Two practices are recommended for this on the property.

  First, where feasible and desirable, retain snags (Large trees that are dead) to be used by cavity nesting species. Several cavity nesting bird species as well as some mammals use tree cavities for nesting habitat. The larger trees have a higher insulation value for these nests as there is more wood on the outside of the nests. A Recommended number of Snags per acre is 1-2. Snags do conflict with high use areas by people as they are not as safe from falling branches or the tree itself over time. When deciding which trees to retain as snags take into account the areas potential use by people (for example sang retention should be avoided in picnic areas).

  The next concept recommended here can be more elaborate in nature. The recommendation is to target the habitat requirements for a key indicator species (Turkey). The wild turkey (spp) is a key indicator species in the area. The Turkey's habitat requirements represent approximately 257 +/- species. If turkey habitat is in excellent condition the species are also enjoying excellent habitat conditions. One example for this is providing better accessible "Roost Trees." Larger Ponderosa pines tend to have their branches flatten out and become horizontal. These branches 15-25 feet above ground are prime roost sites. One of the habitat components for this indicator species. Thinning uphill of trees with this characteristic promotes turkey habitat. Providing habitat components such as this also targets habitat components for several additional species in the system.

Objective 3.4 - explore opportunities to develop water sources for the use of wildlife on the property.

- One of the targets for land management is to provide (or account for) 2 water sources per section (1 square mile or 640 acres). The water sources should also be "Available" to wildlife free from disturbance as best as possible. Stock Ponds and trick tanks are excellent augmentations to naturally occurring streams and ponds. The recommendation is to look for an opportunity to develop a water source in a secluded area to help provide the landscape with an additional water source. The NRCS has programs that can assist with this practice.

Goal 4 – Provide recreational opportunities on the property. Enhance the aesthetic quality of the property.

Objective 4.1 – Perform forestry practices that will provide aesthetic beauty.

- Referencing "Modeling Forest Scenic Beauty: Concepts and Application to Ponderosa Pine;" Two primary characteristics for achieving positive Forest Aesthetics stand out. These are the amount of understory herbage and the presence of Large Ponderosa pine and Gamble Oak. The largest component that lowers scenic beauty is the presence of downed Dead woody material.

  The recommendation is to perform treatments that also serve to enhance scenic beauty while accomplishing objectives. Generally thinning serves to allow more sunlight to reach the forest floor, providing increased opportunity for understory grasses and forbs to grow. If these understory species

are not currently present, the above-mentioned slash used to form a microclimate would cause short-term loss of scenic beauty but provide for increased mod to long- term Scenic beauty.

The thinning method recommendation of achieving basal areas in the 50-70 range are ideal for promoting individual tree growth while also maximizing the number of trees on the ground and significantly lowering the risk of a fire staying on the ground and not getting into the crowns. One study cited needing a 70 + MPH wind event to get a fire to get into the crowns and sustain itself in a stand of trees 50 Square Feet of Basal area or less. The final element to lowering scenic beauty on a site is an excessive amount of saplings and pole size trees.

Objective 4.2 – Develop the property for use as a recreational landscape fitting in with the site plan and the UWC objectives for the use of the campus.

- The school has previously developed a trail map for the site. The school also utilizes the landscape in various educational endeavors in its curriculum. The trail map is found in Appendix J.

Objective 4.3 – Ensure the long-term use of the property serves to enhance the forest while providing for the enjoyment of recreational use by scouting groups and similar organizations.

- The school property has a very high potential to be a model for outdoor education as it stands now and with enhancements and partnerships. As an active participant in forest management one opportunity the school has is to become recognized as a Tree Farm property. The American Forest Foundation Tree farm program is the official Recognition vehicle for forested Properties in New Mexico through the States Stewardship program. The Program itself is an active committee that serves to certify forest properties who demonstrate the 4 tenants of good forest Stewardship: Wood, Water Wildlife and Recreation. The program has a grant program that has been used in the past to develop interpretive and educational opportunities around the state. Some properties that have developed Demonstration Forests are The Philmont Scout Camp, Cimmaron, NM; the Gorham Scout Camp, Chimayo, NM; Campbell Ranch Scout Camp, Tijeras, NM; Starfire Tree Farm, Tijeras, NM; the Chaparral Girl Scout Camp, Jemez Mountains, NM; and the Bartley Property, Penderis, NM. With the active Forest Management, the property would easily qualify for Tree Farm Status.

SCENIC BEAUTY QUOTE FROM MODELING FOREST SCENIC BEAUTY: CONCEPTS AND APPLICATION TO PONDEROSA PINE

In the Woods/Bar-M area, of all the physical characteristics, herbage had by far the greatest effect on preharvest scenic beauty. The most visually important measure of herbage, combined herbage canopy of grasses, forbs, and shrubs, accounted for 48% of the variance in scenic beauty of preharvest sites and for 79% in preharvest stands. Large ponderosa pine trees and Gambel oak of all sizes also enhanced scenic beauty. Downed wood consistently lowered scenic beauty, especially as slash. In addition, pine saplings and poles detracted from scenic beauty when they were present in large quantities.

Goal 5 – Continue to develop a comprehensive property map showing existing roads, existing thinning, future management areas, approximate property line locations and ownership and past uses. This goal will become the "existing condition" within the Stewardship Plan and provide a planning baseline for future forest management and treatment objectives.

Objective 5.1 - identify future management areas that can be accessed by roads. Identify potential benefits or negative impacts.

- The first two management areas and actions are currently underway. A 15 Acre Forest Health Incentives program (FHIP) has been identified and applied for funding. The 15 acres identified is directly West of the interior private property. The funding is intended to reduce the risk of bark beetle attach by creating a more resilient forest. The project will also serve to reduce fire risk and optimize the productivity of the forest as well.
- The second management activity is intended to remove bark beetle trees that were killed during the 2023 season and are visible from the main campus. The work discussed takes place on the slope to the East of the Castle with the material used to prevent excessive erosion on the slope. 10 – 15 acres of treatment is possible for this practice.
- With the timber information provided in this plan a general recommendation is to choose areas for the next work to occur informing the choice by looking at the denser areas to prioritize the trade offs with doing the work.

Objective 5.2 - sample existing thinning and develop a multiple year action plan.

- From the forest conditions observed on the ground the recommendation is to continue to prioritize the reduction of basal area South and West of the interior private land, Treat the South of the highway forest for thinning and, include infrastructure on the property as an area to protect. There were no areas on the property that I would exclude from consideration.

Objective 5.3 - review existing roads; recommend best management practices and maintenance procedures to limit actual or potential erosion.

- The recommendation is to try to avoid adding any roads to the landscape. If access is required look at using low impact vehicles on trails that can be reclaimed easily if used. If a specific future objective presents itself take a quality look at the soil types Noted in this plan) to make the best decision possible.

Property line locations are approximate and should be used for informational purposes only until their exact location can be confirmed through additional GPS corrections or other means of legal survey.

APPROVAL SHEET

FOREST STEWARDSHIP PLAN

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.

Planner: Todd Haines, Certified Forester Date

Landowner Representative XXXX Date

Approved By: Shannon Atencio, Las Vegas District Forester Date

Appendix A: New Mexico Rare Plants for San Miguel County

Select Rare Plants are noted in this appendix. Those that may not be mentioned or others that are added after the completion of this plan can be found at the following link: http://nmrareplants.unm.edu/

SAN MIGUEL | New Mexico Rare Plants (unm.edu)

Appendix B: Soil Information

The following Soil survey information was prepared online through the Natural Resource Conservation Service Web Site. This is a custom survey for this property. It includes information on the surrounding properties.

United States Department of Agriculture

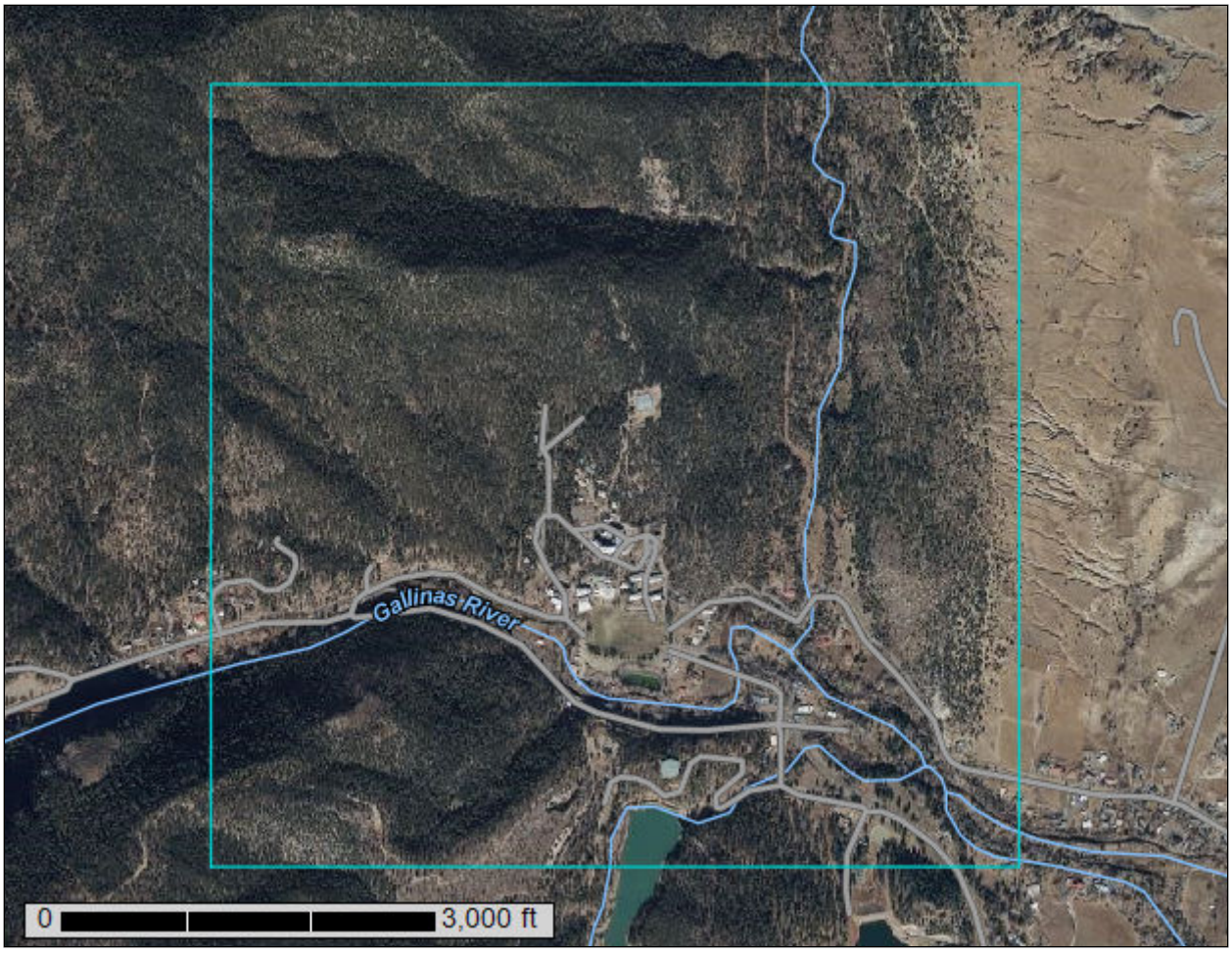
NRCS

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 San Miguel County Area, New Mexico

United World College and Surrounding area



March 4, 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

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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.

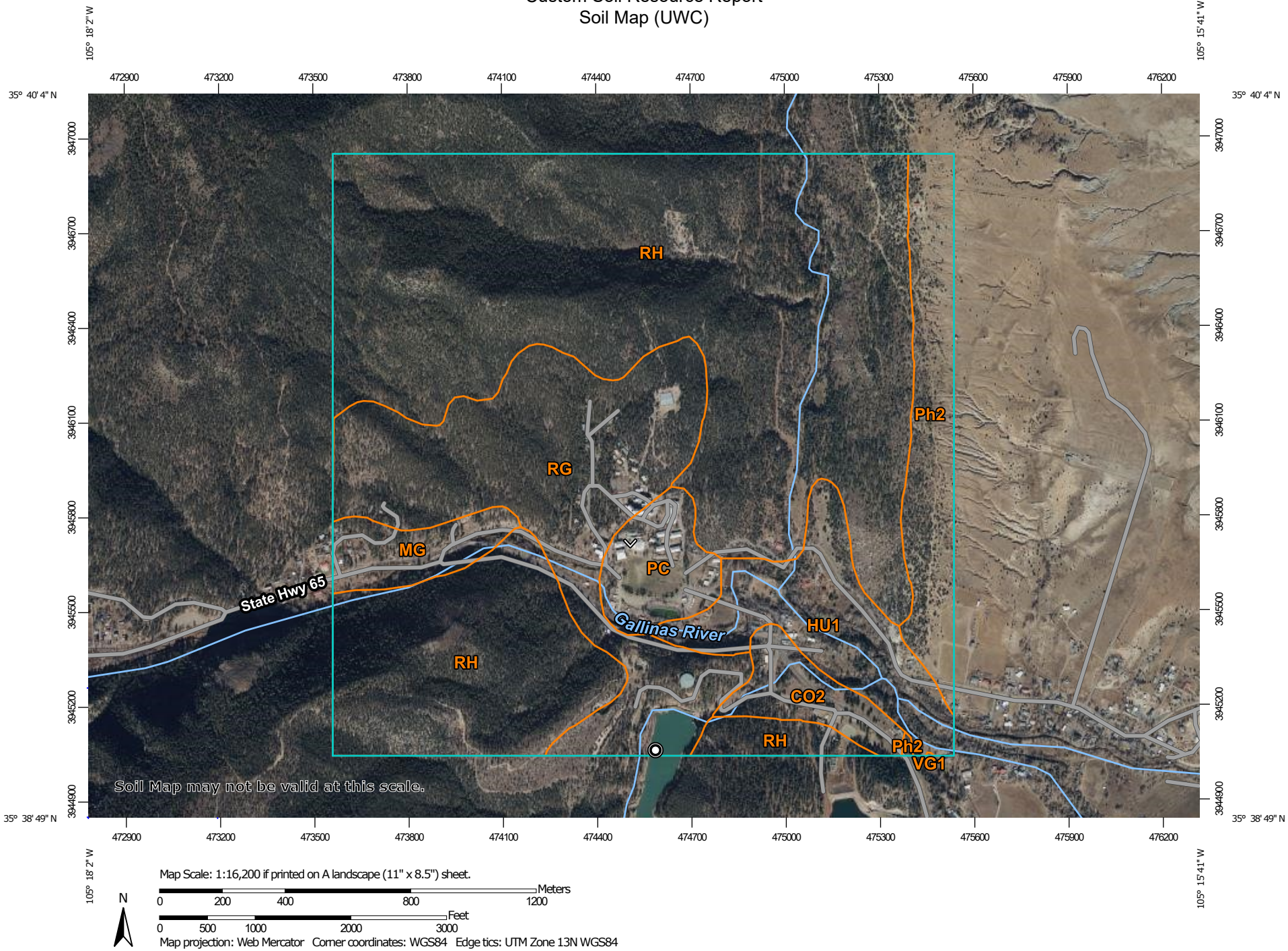
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree 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.


105° 18' 2" W
105° 15' 41" W
35° 40' 4" N
35° 38' 49" N
472900
473200
473500
473800
474100
474400
474700
475000
475300
475600
475900
476200
3947000
3946700
3946400
3946100
3945800
3945500
3945200
3944900
RH
RG
Ph2
MG
PC
State Hwy 65
Gallinas River
HU1
RH
CO2
RH
Ph2
VG1
Soil Map may not be valid at this scale.
Map Scale: 1:16,200 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 200 400 800 1200
Feet
0 500 1000 2000 3000
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 1:48,000.

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: San Miguel County Area, New Mexico
Survey Area Data: Version 17, 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 15, 2021—Dec 11, 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 (UWC)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CO2	Colmor-Onava complex, fan remnants - MLRA70A.1	25.3	2.7%
HU1	Haplustolls-Ustifluvents-Riverwash complex, floodplains - MLRA 70A.1	66.8	7.1%
MG	Moreno-Brycan association, sloping	25.3	2.7%
PC	Partri loam, undulating	30.7	3.3%
Ph2	Philmont silt loam, plateau interfluves, gently sloping - MLRA 70A.1	59.9	6.4%
RG	Rocio-Dargol-Stout association, hilly	175.2	18.7%
RH	Rock outcrop-Haploborolls complex, very steep	552.0	59.0%
VG1	Vegocito and Gallinas soils, stream terraces - MLRA 70A.1	0.0	0.0%
Totals for Area of Interest		**935.3**	**100.0%**

Map Unit Descriptions (UWC)

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.

San Miguel County Area, New Mexico

CO2—Colmor-Onava complex, fan remnants - MLRA70A.1

Map Unit Setting

National map unit symbol: 2z7g4
Elevation: 5,000 to 7,240 feet
Mean annual precipitation: 15 to 18 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 130 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Colmor and similar soils: 60 percent
Onava and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colmor

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy eolian deposits over residuum weathered from limestone and shale

Typical profile

A - 0 to 3 inches: loam
AB - 3 to 14 inches: silty clay loam
Bk - 14 to 45 inches: silty clay loam
Ck - 45 to 79 inches: loam
R - 79 to 89 inches: bedrock

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 59 to 79 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 low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R070AA003NM - Loamy Uplands

Hydric soil rating: No

Description of Onava

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Fine-loamy alluvium derived from limestone, sandstone, and shale and/or silty and clayey loess

Typical profile

A - 0 to 4 inches: clay loam
Bt - 4 to 17 inches: clay
Btk - 17 to 29 inches: silty clay loam
Bk - 29 to 48 inches: silty clay loam
BCkk - 48 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Nonsaline to very slightly saline (1.5 to 2.5 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R070AA002NM - Clayey Uplands
Hydric soil rating: No

HU1—Haplustolls-Ustifluvents-Riverwash complex, floodplains - MLRA 70A.1

Map Unit Setting

National map unit symbol: 2yj18
Elevation: 5,500 to 7,200 feet
Mean annual precipitation: 15 to 18 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 130 to 175 days

Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Haplustolls and similar soils: 60 percent
Ustifluvents and similar soils: 25 percent
Riverwash: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haplustolls

Setting

Landform: Flood-plain steps on flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium derived from igneous and sedimentary rock over coarse-loamy alluvium derived from igneous and sedimentary rock over sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 22 inches: sandy loam
AC - 22 to 37 inches: fine sandy loam
C - 37 to 79 inches: stratified coarse sand to loamy coarse sand to gravelly loamy sand to sandy loam to gravelly clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Ecological site: R070AA010NM - Riparian
Hydric soil rating: No

Description of Ustifluvents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium derived from igneous and sedimentary rock over sandy and gravelly alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 5 inches: gravelly sandy clay loam
AC - 5 to 22 inches: stratified gravelly loamy coarse sand to silt loam to clay loam to clay
Cg - 22 to 79 inches: stratified sand to cobbly sandy loam to silt loam to cobbly sandy clay loam to gravelly clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 14.17 in/hr)
Depth to water table: About 11 to 51 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R070AA010NM - Riparian
Hydric soil rating: No

Description of Riverwash

Setting

Landform: Channels on flood plains
Parent material: Over sandy and gravelly alluvium derived from igneous and sedimentary rock

Properties and qualities

Slope: 0 to 1 percent
Frequency of flooding: Very frequent

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R070AA010NM - Riparian

MG—Moreno-Brycan association, sloping

Map Unit Setting

National map unit symbol: dls1
Elevation: 5,300 to 9,000 feet

Mean annual precipitation: 12 to 22 inches
Mean annual air temperature: 44 to 52 degrees F
Frost-free period: 100 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Moreno and similar soils: 45 percent
Brycan and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Moreno

Setting

Landform: Fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine textured alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 12 inches: loam
H2 - 12 to 53 inches: clay loam
H3 - 53 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R048AY002NM - Mountain Grassland
Hydric soil rating: No

Description of Brycan

Setting

Landform: Alluvial fans, valley floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear, concave
Across-slope shape: Linear

Parent material: Mixed alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 49 inches: loam
H3 - 49 to 60 inches: loam

Properties and qualities

Slope: 3 to 5 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: 20 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R048AY002NM - Mountain Grassland
Hydric soil rating: No

Minor Components

Kiln

Percent of map unit: 7 percent
Ecological site: F070AY021NM - Pinus edulus-Juniperus monosperma/Quercus gambleii/Bouteloua curtipendula
Hydric soil rating: No

Stout

Percent of map unit: 7 percent
Ecological site: R049XE223CO - Shrubby Foothill
Hydric soil rating: No

Wet soils

Percent of map unit: 6 percent
Landform: Playas
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R070AY001NM - Loamy Upland
Hydric soil rating: Yes

PC—Partri loam, undulating

Map Unit Setting

National map unit symbol: dls6
Elevation: 4,300 to 7,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Partri

Setting

Landform: Plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous eolian deposits and alluvium derived from limestone and sandstone

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 60 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately 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: 50 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6c

Hydrologic Soil Group: C
Ecological site: R070AA002NM - Clayey Uplands
Hydric soil rating: No

Minor Components

Bernal
Percent of map unit: 3 percent
Ecological site: R070AY003NM - Shallow Upland
Hydric soil rating: No

Tricon
Percent of map unit: 2 percent
Ecological site: R070AY001NM - Loamy Upland
Hydric soil rating: No

Carnero
Percent of map unit: 2 percent
Ecological site: R070AY001NM - Loamy Upland
Hydric soil rating: No

La brier
Percent of map unit: 2 percent
Ecological site: R070AY002NM - Clayey Upland
Hydric soil rating: No

Minor components
Percent of map unit: 1 percent
Landform: Playas
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R070AY001NM - Loamy Upland
Hydric soil rating: Yes

Ph2—Philmont silt loam, plateau interfluves, gently sloping - MLRA 70A.1

Map Unit Setting
National map unit symbol: 2yj0y
Elevation: 5,300 to 7,200 feet
Mean annual precipitation: 15 to 18 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 130 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition
Philmont and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Philmont

Setting

Landform: Fan remnants, interfluves
Down-slope shape: Concave, linear
Across-slope shape: Convex, linear
Parent material: Loess over slope alluvium derived from clayey shale over residuum weathered from clayey shale

Typical profile

A - 0 to 6 inches: silt loam
Bt - 6 to 17 inches: clay loam
Btk - 17 to 35 inches: clay
Bk - 35 to 44 inches: clay loam
BCk - 44 to 54 inches: clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline (0.4 to 1.8 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R070AA002NM - Clayey Uplands
Hydric soil rating: No

RG—Rocio-Dargol-Stout association, hilly

Map Unit Setting

National map unit symbol: dlsg
Elevation: 5,300 to 9,000 feet
Mean annual precipitation: 12 to 27 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 70 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Rocio and similar soils: 35 percent

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

Description of Rocio

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and colluvium derived from sandstone and shale

Typical profile

H1 - 0 to 18 inches: stony loam
H2 - 18 to 60 inches: clay

Properties and qualities

Slope: 9 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 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: 2.0
Available water supply, 0 to 60 inches: High (about 9.0 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

Description of Dargol

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine textured residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 9 inches: stony loam
H2 - 9 to 37 inches: clay
H3 - 37 to 47 inches: bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 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: 2.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F070AY022NM - Pinus ponderosa-Juniperus scopulorum/Quercus gambleii
Hydric soil rating: No

Description of Stout

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian deposits, alluvium and residuum weathered from sandstone

Typical profile

H1 - 0 to 4 inches: cobbly sandy loam
H2 - 4 to 10 inches: cobbly sandy loam
H3 - 10 to 20 inches: bedrock

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: 6 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 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: 2.0
Available water supply, 0 to 60 inches: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R049XE223CO - Shrubby Foothill
Hydric soil rating: No

Minor Components

Brycan

Percent of map unit: 4 percent
Ecological site: R048AY002NM - Mountain Grassland
Hydric soil rating: No

Rock outcrop

Percent of map unit: 4 percent
Hydric soil rating: No

Kiln

Percent of map unit: 4 percent
Ecological site: F070AY021NM - Pinus edulus-Juniperus monosperma/Quercus gambleii/Bouteloua curtipendula
Hydric soil rating: No

Moreno

Percent of map unit: 4 percent
Ecological site: R048AY002NM - Mountain Grassland
Hydric soil rating: No

Wet soils

Percent of map unit: 4 percent
Landform: Playas
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F070AY022NM - Pinus ponderosa-Juniperus scopulorum/Quercus gambleii
Hydric soil rating: Yes

RH—Rock outcrop-Haploborolls complex, very steep

Map Unit Setting

National map unit symbol: dlsh
Elevation: 5,000 to 9,000 feet
Mean annual precipitation: 12 to 22 inches
Mean annual air temperature: 44 to 54 degrees F
Frost-free period: 100 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Haploborolls and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: bedrock

Properties and qualities

Slope: 30 to 75 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 low to moderately low (0.00 to 0.06 in/hr)

Interpretive groups

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

Description of Haploborolls

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium, colluvium and residuum weathered from limestone, sandstone, and shale

Typical profile

H1 - 0 to 10 inches: very stony loam
H2 - 10 to 41 inches: extremely stony fine sandy loam
H3 - 41 to 60 inches: bedrock

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Gypsum, maximum content: 2 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 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F070AY022NM - Pinus ponderosa-Juniperus scopulorum/Quercus gambleii
Hydric soil rating: No

Minor Components

Mion
Percent of map unit: 2 percent
Ecological site: R070AY009NM - Shale Hills
Hydric soil rating: No

Bernal
Percent of map unit: 2 percent
Ecological site: R070AY003NM - Shallow Upland
Hydric soil rating: No

Dargol
Percent of map unit: 2 percent
Ecological site: F070AY022NM - Pinus ponderosa-Juniperus scopulorum/Quercus gambleii
Hydric soil rating: No

Tuloso
Percent of map unit: 2 percent
Ecological site: R042CY122NM - Shallow Sandy Savanna
Hydric soil rating: No

Kiln
Percent of map unit: 1 percent
Ecological site: F070AY021NM - Pinus edulus-Juniperus monosperma/Quercus gambleii/Bouteloua curtipendula
Hydric soil rating: No

Stout
Percent of map unit: 1 percent
Ecological site: R049XE223CO - Shrubby Foothill
Hydric soil rating: No

VG1—Vegocito and Gallinas soils, stream terraces - MLRA 70A.1

Map Unit Setting
National map unit symbol: 2yj19
Elevation: 5,500 to 7,200 feet
Mean annual precipitation: 15 to 18 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 130 to 175 days
Farmland classification: Farmland of local importance, if irrigated

Map Unit Composition

Vegocito and similar soils: 60 percent
Gallinas and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vegocito

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy loess derived from sedimentary rock over clayey alluvium derived from igneous, metamorphic and sedimentary rock over sandy and gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 6 inches: clay loam
Bt - 6 to 16 inches: clay loam
Btk - 16 to 53 inches: clay loam
BCkg - 53 to 69 inches: clay
C - 69 to 79 inches: stratified very gravelly sandy clay loam to cobbly clay loam

Properties and qualities

Slope: 0 to 3 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 low to moderately high (0.14 to 1.42 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: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R070AA012NM - Low Terraces
Hydric soil rating: No

Description of Gallinas

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy loess derived from sedimentary rock over fine-loamy alluvium derived from igneous, metamorphic and sedimentary rock over sandy

and gravelly alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 3 inches: loam
AB - 3 to 11 inches: loam
Bt - 11 to 35 inches: clay loam
Btk - 35 to 75 inches: clay loam
C - 75 to 79 inches: stratified coarse sand to gravelly sandy clay loam to gravelly sandy clay

Properties and qualities

Slope: 0 to 3 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 low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R070AA012NM - Low Terraces
Hydric soil rating: No

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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: Troublesome Weeds of New Mexico

The attached publication and other noxious weed information can be found at

troublesomeweedsnm_small.pdf (nmsu.edu)

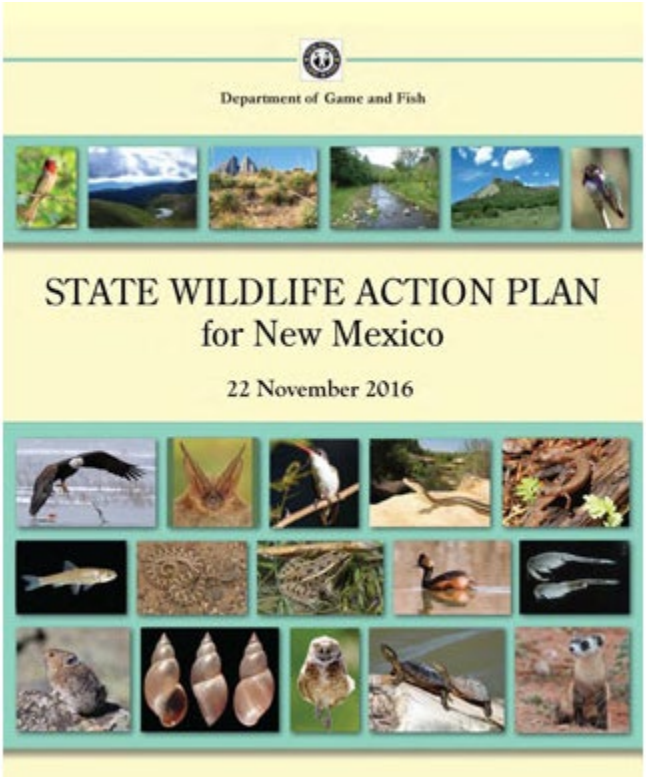
Troublesome Weeds of New Mexico

Jamshid Ashigh, James Wanstall and Frank Sholedice

College of Agricultural, Consumer and Environmental Sciences
Cooperative Extension Service

Appendix D: State Wildlife Action Plan for New Mexico

New-Mexico-State-Wildlife-Action-Plan-SWAP-Final-2019.pdf



Appendix E: Environmental Review from the Environmental Review Tool NM Game and Fish.

PROJECT INFORMATION

Project Title:	United World College Forest Management Plan
Project Type:	FOREST MANAGEMENT, GENERAL
Latitude/Longitude (DMS):	35.657087 / -105.282767
County(s):	SAN MIGUEL
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: Provide for appropriate wildfire protection in this fire adapted ecosystem; Part of the Gallinas watershed; enhance and maintain riparian areas on the property, specifically those with riparian species such as narrow leaf cottonwood stands; Implement forest treatments and activities that improve habitat for key indicator wildlife species and serve to protect from forest insect and disease issues; Provide for recreational opportunities on the property. Enhance the aesthetic quality of the property; - Continue to develop a comprehensive property map showing existing roads, existing thinning, future management areas, approximate property line locations and ownership and past uses. This goal will become the "existing condition" within the Stewardship Plan and provide a planning baseline for future forest management and treatment objectives.

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

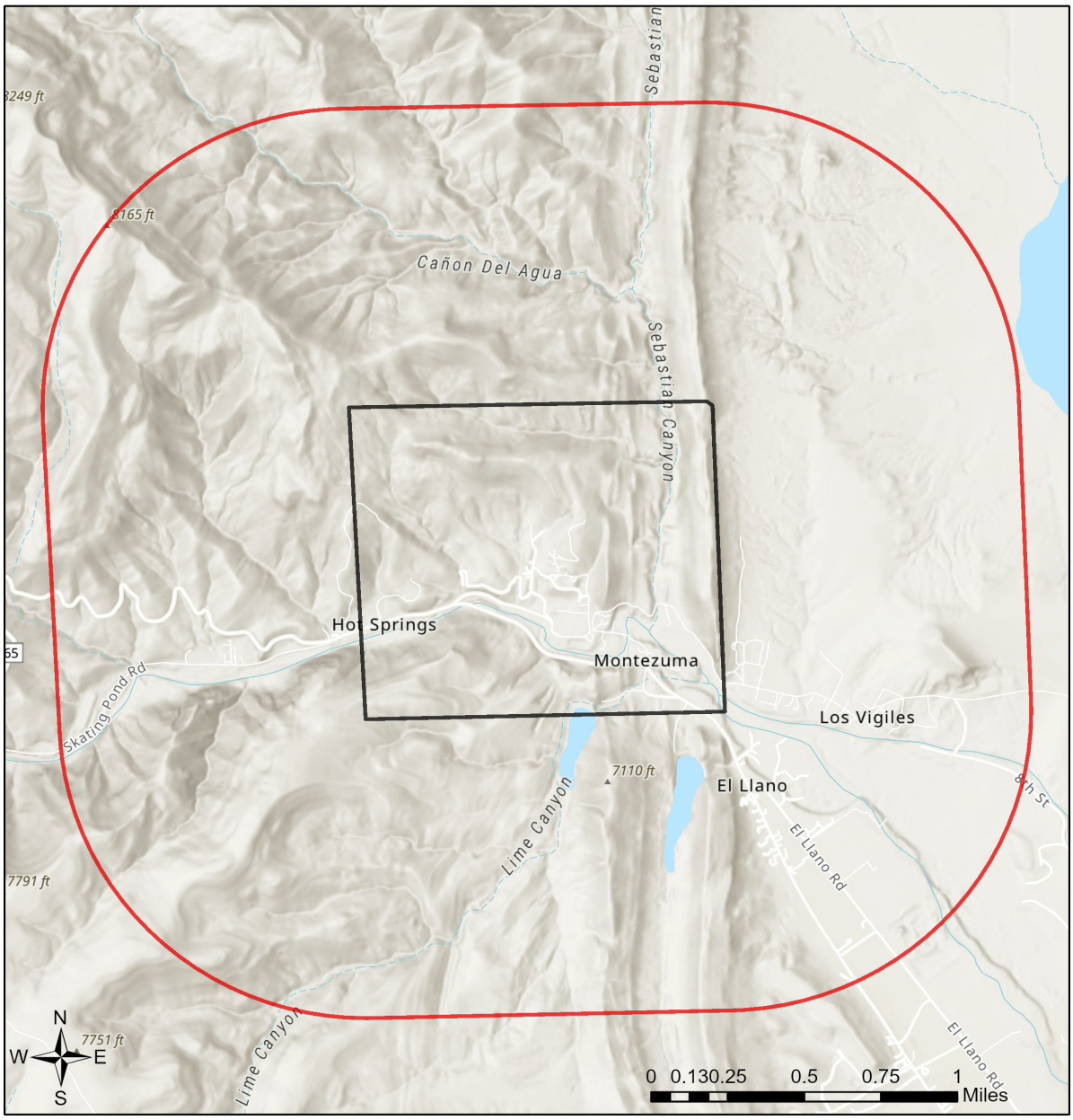
OVERALL STATUS

The information contained within this report comprises the recommendations of the New Mexico Department of Game and Fish (Department) for management and mitigation of proposed project impacts to wildlife and habitat resources; see the Project Recommendations section below for further details. No further consultation with the Department is required based on the project's location and, with implementation of mitigation measures described in the Project Recommendations section below, no adverse effects to wildlife or important habitats are anticipated. However, a Department biologist may be in touch within 30 days if they determine that further review is required.

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.

United World College Forest Management Plan



NHNM, USGS, USFS, US Census Bureau, NMDGF
Esri, NASA, NGA, USGS, FEMA
Texas Parks & Wildlife, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Special Status Animal Species Potentially within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI	USFS	USFS SCC	BLM
Boreal Chorus Frog	Pseudacris maculata			SGCN			
Northern Leopard Frog	Lithobates pipiens			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Eared Grebe	Podiceps nigricollis			SGCN			
Clark's Grebe	Aechmophorus clarkii			SGCN			
Brown Pelican	Pelecanus occidentalis		E	SGCN			
Bald Eagle	Haliaeetus leucocephalus		T	SGCN	Sensitive Species		BLM SENSITIVE
Peregrine Falcon	Falco peregrinus		T	SGCN			BLM WATCH
Mountain Plover	Charadrius montanus			SGCN	Sensitive Species		BLM WATCH
Long-Billed Curlew	Numenius americanus			SGCN			BLM WATCH
Western Burrowing Owl	Athene cunicularia hypugaea			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Mexican Spotted Owl	Strix occidentalis lucida	LT		SGCN			
Common Nighthawk	Chordeiles minor			SGCN			
Lewis's Woodpecker	Melanerpes lewis			SGCN		USFS R3 SCC	BLM WATCH
Red-Headed Woodpecker	Melanerpes erythrocephalus			SGCN			
Williamson's Sapsucker	Sphyrapicus thyroideus			SGCN			
Olive-Sided Flycatcher	Contopus cooperi			SGCN			
Southwestern Willow Flycatcher	Empidonax traillii extimus	LE	E	SGCN			
Bank Swallow	Riparia riparia			SGCN			
Pinyon Jay	Gymnorhinus cyanocephalus			SGCN		USFS R3 SCC	BLM SENSITIVE
Clark's Nutcracker	Nucifraga columbiana			SGCN			
Juniper Titmouse	Baeolophus ridgwayi			SGCN		USFS R3 SCC	BLM WATCH
Pygmy Nuthatch	Sitta pygmaea			SGCN			
Western Bluebird	Sialia mexicana			SGCN			
Mountain Bluebird	Sialia currucoides			SGCN			

Special Status Animal Species Potentially within 1 Miles of Project Area

Common Name	Scientific Name	USFWS (ESA)	NMDGF (WCA)	NMDGF SGCN/SERI	USFS	USFS SCC	BLM
Loggerhead Shrike	Lanius ludovicianus			SGCN		USFS R3 SCC	BLM WATCH
Gray Vireo	Vireo vicinior		T	SGCN	Sensitive Species	USFS R3 SCC	BLM WATCH
Black-Throated Gray Warbler	Setophaga nigrescens			SGCN			BLM WATCH
Grace's Warbler	Setophaga graciae			SGCN		USFS R3 SCC	BLM WATCH
Vesper Sparrow	Pooecetes gramineus			SGCN			
Thick-billed Longspur	Rhynchophanes mccownii			SGCN			BLM SENSITIVE
Chestnut-Collared Longspur	Calcarius ornatus			SGCN			BLM SENSITIVE
Cassin's Finch	Haemorhous cassinii			SGCN			BLM WATCH
Evening Grosbeak	Coccothraustes vespertinus			SGCN			
Rainbow Trout	Oncorhynchus mykiss			SERI			
Brown Trout	Salmo trutta			SERI			
Rio Grande Chub	Gila pandora			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Least Shrew	Cryptotis parva		T	SGCN			BLM WATCH
Pale Townsend's Big-Eared Bat	Corynorhinus townsendii pallescens			SGCN	Sensitive Species	USFS R3 SCC	BLM SENSITIVE
Gunnison's Prairie Dog	Cynomys gunnisoni			SGCN	Sensitive Species		BLM SENSITIVE
Black Bear	Ursus americanus			SERI			
Pacific Marten	Martes caurina		T	SGCN		USFS R3 SCC	
Mountain Lion	Puma concolor			SERI			
Elk	Cervus canadensis			SERI			
Mule Deer	Odocoileus hemionus			SERI			
Western Ribbon Snake	Thamnophis proximus		T	SGCN	Sensitive Species		
Desert Massasauga	Sistrurus catenatus edwardsii			SGCN			

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

Project Recommendations

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

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 birds, nests, eggs, or nestlings, 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. Breeding season may begin earlier for raptors or when working in low-elevation habitats such as deserts. If ground disturbing and clearing activities must be conducted during the breeding season, the area should be surveyed for active nest sites (with birds or eggs present in the nesting territory) and avoid disturbing active nests until young have fledged. For active nests, establish adequate buffer zones to minimize disturbance to nesting birds. Buffer distances should be at least 100 feet from songbird and raven nests; 0.25 miles from most raptor nests; and 0.5 miles for ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos canadensis*), peregrine falcon (*Falco peregrinus*), and prairie falcon (*Falco mexicanus*) nests. Active nest sites in trees or shrubs that must be removed should be mitigated by qualified biologists or wildlife rehabilitators. Department biologists are available to consult on nest site mitigation and can facilitate contact with qualified personnel.
The list of New Mexico SGCN (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.

For forestry and forest restoration projects, including fire management activities, occurring in ponderosa pine forests, the Department recommends following the Ponderosa Pine Restoration Guidelines to Benefit Wildlife.

Burrowing owl (*Athene cunicularia*) may occur within your project area. Burrowing owls are protected from take by the Migratory Bird Treaty Act and under New Mexico state statute. Before any ground disturbing activities occur, the Department recommends that a preliminary burrowing owl survey be conducted by a qualified biologist using the Department's burrowing owl survey protocol. Should burrowing owls be documented in the project area, please contact the Department or USFWS for further recommendations regarding relocation or avoidance of impacts.

Prairie dog colonies may occur within the vicinity of your project area. Both black-tailed prairie dogs (*Cynomys ludovicianus*) and Gunnison's prairie dogs (*Cynomys gunnisoni*) are designated as New Mexico SGCN, and their colonies provide important habitat for other grassland wildlife. Wherever possible, occupied prairie dog colonies should be left undisturbed, and all project activities should be directed off the colony. Any burrows that are located on the project site should be surveyed by a qualified biologist to determine whether burrows are active or inactive and whether burrowing owls may be utilizing the site. Colonies within the range of the black-tailed prairie dog can be surveyed by a qualified biologist diurnally, year-round using binoculars. Colonies within the range of the Gunnison’s prairie dog can be surveyed by a qualified biologist diurnally, using binoculars during the warmer months from April through October and by searching for fairly fresh scat and lack of cobwebs or debris at the mouths of burrows during the cold months (November through March). If ground-disturbing activities cannot be relocated off the prairie dog colony, or if project activities involve control of prairie dogs, the Department recommends live-trapping and relocation of prairie dogs. The Department can provide recommendations regarding suitability of potential translocation areas and procedures.

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 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.

Appendix F: Timber Inventory

The following Reconnaissance and Cruise Report is a summary of raw data from a timber inventory taken on the property. These data were used to better form recommendations for the thinning on the property along with a reference for other land management practices. This Report also forms the foundation of land management recommendations within the Stewardship Plan.

NEW MEXICO FORESTRY DIVISION - FCI 20011, VARIABLE PLOT CRUISE

LANDOWNER: UWC
ADDRESS:
LOCATION: Mont Campus

DATE:
FOREST TYPE: Pipo PJ
TRACT ACRES 160

PAGE ____ OF ____
BA FACTOR: 10
NUM.OF PLOTS: 43
BOARDER LINE: IN OUT

PLOT NO.	SPECIES (CODES)	DIAMETER CLASS (Inches) and SIZE CLASS																	Seedlings Dia: 0.5-0.99 Ht:	Chips 2"max 6"max Mastl				Slash 24" max	Scattered Firewood
		SAPLINGS			POLETIMBER			SAWTIMBER												N	S	E	W	Trans.	
			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+		11.78'				50'/5'	
		BA	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32+	<4.5'						Y/N
1	PIPO	80							1		4	1	1		1										
2	PIPO	40			1	1		1	1																
2	PIED	10				1																			
3	PIPO	80		1		1	1	1		3	1														
4	PIPO	90			1			3	1	4															
5	PIED	70					3	1		1	2														
6	PIED	40						2	2			1													
7	PIPO	10								1															
7	PIED	40							2		2														
7	JUDE	10								1															
8	PIED	60		1	2				1	1			1												
9	PIED	90	1	1	3	1	1	2																	
10	PIED	50			1	1		2	1																
11	PIED	70				3		1	1	2															
11	JUMO	10			1																				
12	PIED	30					1		1	1															
12	PIPO	20									2														
13	PIED	60			1	2	1	2																	
14	PIED	70			3	1	1	1	1																
15	PIED	60		2	2			1			1														
15	JUMO	**10**							**1**																
16	PIPO	**30**							**1**			**1**	**1**												
16	JUDE	**10**												**1**											
16	PIED	10				1																			
17	PIPO	30							1	1				**1**											
18	PIPO	60					1	1		2	2														
18	JUMO	20		1	1																				
19	PIPO	100				1	4	1	2	2															
20	PIPO	80				1	2	4		1															
20	JUMO	10		1																					
21	PIPO	130		1			1	3	4	3	1														
22	PIPO	80			2		5	1																	
23	PIPO	60			1	3	2																		

PLOT NO.	SPECIES (CODES)	DIAMETER CLASS (Inches) and SIZE CLASS																	Seedlings Dia: 0.5-0.99	Chips 2"max 6"max Mastl				Slash 24" max	Scattered Firewood
		SAPLINGS			POLETIMBER			SAWTIMBER												N	S	E	W	Trans.	
			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+		11.78'				50'/5'	
		BA	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32+	<4.5'						Y/N
24	PIPO	100		1			4	1	3	1															
25	PIPO	40				1	2	1																	
25	PIED	30		1	1		1																		
26	PIED	20					2			1															
27	PIPO	100			2	2	3	3																	
27	JUMO	10					1																		
28	PIPO	110			3	1	4	3																	
29	PIPO	100		1		3	3	2	1																
30	PIPO	50					3	1	1																
31	PIPO	140				5	7	2																	

32	PIPO	60				3		2	1																	
33	PIPO	80			1		4	3																		
34	PIPO	90					2	6	1																	
35	PIPO	100		2	1	4	1	2																		
36	PIPO	80			2		1	5																		
37	PIPO	40		2			1	1																		
37	PIED	20		1	1																					
38	PIPO	70		1	3			2		1																
38	PIED	20		2																						
39	PIED	50				2	1		2																	
39	JUMO	30				1	2																			
40	PIED	40			1	1		1		1																
41	PIED	120		3	1	4	2			2																
42	PIED	90		1	4	1	2	1																		
43	PIPO	50				1	1	2	1																	
TOTAL		3260	1	23	39	46	70	65	31	29	15	3	3	2	1	0	0	0								
(*) Variable Plot Exp Factor		617	46.1	11.5	5.1	2.87	1.84	1.27	0.936	0.717	0.566	0.459	0.379	0.318	0.271	0.234	0.204	0.179	300							
(*) BAF		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	43							
(÷) Num Plots		43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43								
(=) Trees/Ac		467772.1	10.7	61.5	46.3	30.7	30.0	19.2	6.7	4.8	2.0	0.3	0.3	0.1	0.1	0.0	0.0	0.0								

BASAL AREA

	SAPS	PT	ST	TOTAL
= Tallied	24	155	149	328
X BAF	10	10	10	10
÷ No Pts	43	43	43	43
BA / AC	5.58	36.05	34.65	76.28
AVE VOL				

AVERAGE DIAMETER

	SAPS	PT	ST	TOTAL
BA / AC	5.58	36.05	34.65	76.28
÷ TREES / AC	72.2	106.9	33.6	212.7
÷ .005454				65.8
SQ RT				
AVG DIA (QDM)				8.1

SPECIES COMPOSITION %

JUMO	PIPO	PIPU	
JUDE	PSME	POTR	
JUSC	ABCO	QUGA	
PIED	PIST		

FCI 2011: Variable Plot

Appendix G: Heritage Reports

The following is the heritage site report downloaded from the State Historic Preservation Office website (SHiPO). No recorded sites were found at SHiPO.

New Mexico Historic Preservation Division | Home (nmhistoricpreservation.org)

This database is only for "Qualified Users"

Appendix H: Link to a list of commonly used forestry definitions

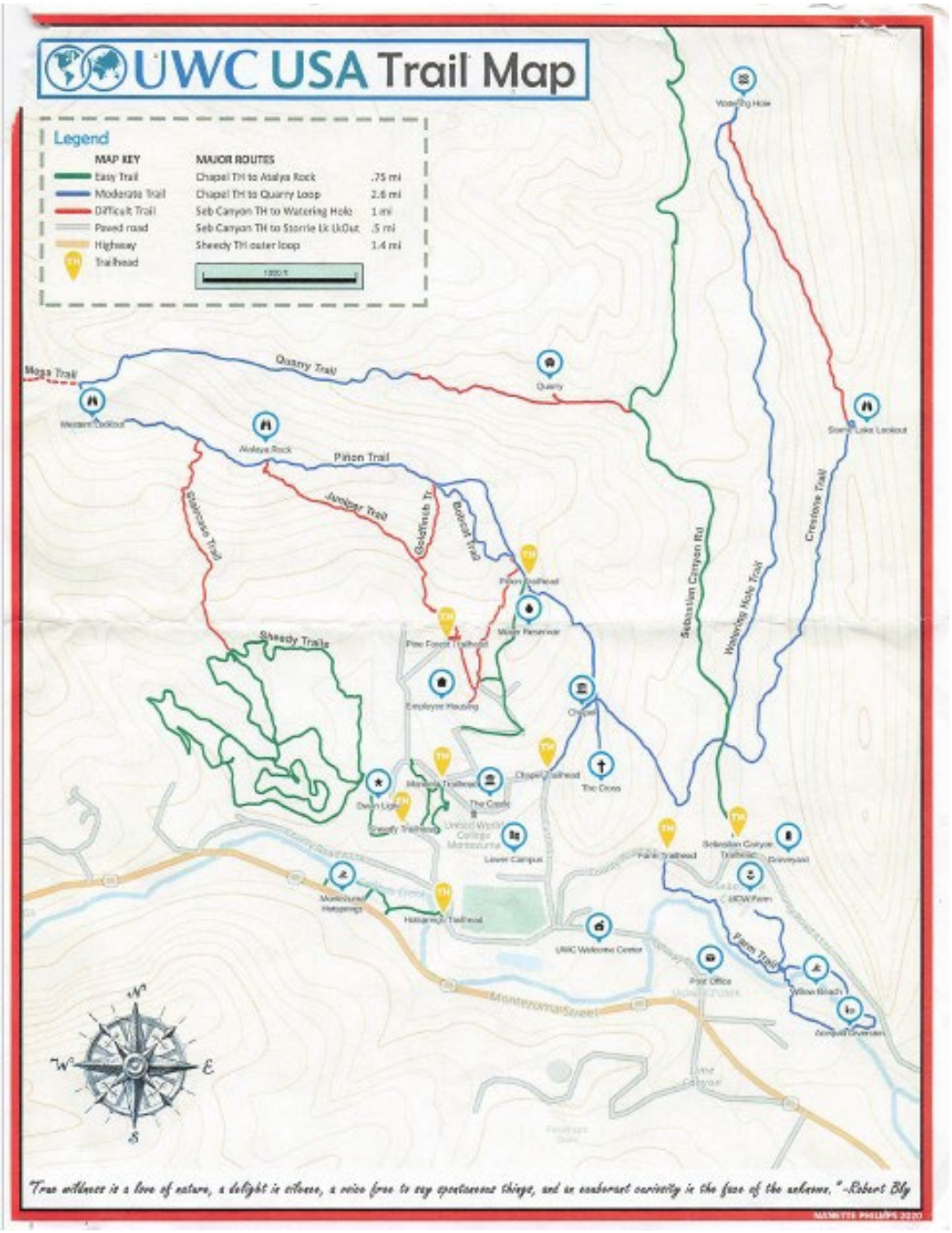
forestry_wood20a.pdf (usda.gov)

Appendix I: New Mexico Forest Practices Guidelines

These guidelines can be found at:
http://www.emnrd.state.nm.us/SFD/Publications/PubsMain.html

They cover every aspect of forest management within New Mexico.

Appendix J: Trail Map



Appendix K: Watershed Primer

This primer and other watershed information can be found at: http://allaboutwatersheds.org/ The site requires registration (free).

Appendix L: Ecological Restoration of Southwestern Ponderosa Pine Ecosystems: A Broad Prospective

The attached link to this paper was published in 2002 (Craig Allen, etal.) by the Ecological Restoration Institute which has become a leader in establishing principals and scientific restoration approaches for re-establishing ponderosa pine ecosystems in the Southwest that are capable of withstanding frequent low intensity fires while lessening the risk of crown fire.

Allen-Restoration-2002.pdf (biologicaldiversity.org)