
Scenic Character Description



Santa Fe National Forest

Coyote, Cuba, Española, Jemez, and Pecos/Las Vegas Ranger Districts
Los Alamos, Mora, Rio Arriba, Sandoval, Santa Fe, and San Miguel Counties

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NOTE: Photos in this document, unless otherwise stated, were taken by Nicole Hill, TEAMS Landscape Architect, in June 2013 during the site visit for completing the Scenery Management System inventories. Most photos have a corresponding GPS point, which are shown in Figure 1. Cover photo is from the forest intranet website. [<http://fsweb.santafe.r3.fs.fed.us/>].

Introduction

Scenic character is a combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place. The term scenic character has been established in the 2012 Forest Planning Rule and will be used in place of landscape character throughout this document.

Scenic character gives a geographic area its visual and cultural image, combining the physical, biological and cultural attributes that make each landscape identifiable or unique. All landscapes have definable scenic character attributes. In most national forest settings, scenic character attributes are positive natural elements (e.g. landform, vegetative patterns, and water). In pastoral or rural/agricultural settings, positive cultural elements may include historic features such as stone bridges, split rail fences, stone walls, barns, cabins, and hedge rows. In urban settings, scenic character may include architectural styles. Combinations of these attributes define scenic character and express the positive image of the landscape.

The scenic character descriptions are a narrative describing the human habitat, heritage, and social ties to the landscape along with the physical and biological characteristics of the landscape. Developing scenic character descriptions takes place in the inventory stage of the scenery management system (SMS) process and provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity. They are also used to develop the desired scenic character, scenic character goals and scenic integrity objectives in the Forest Plan, and as a reference for future site-specific projects.

Scenic character descriptions offered in this document are based on Ecological Subsections. Descriptions for these subsections were not available at the time this document was written. The ecological component information was compiled from a variety of sources including but not limited to Ecological Subregions of the United States (McNab and Avers 1994a,b, c), Ecological Subregions: Sections of the Conterminous United States (McNab et al. 2005), Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991), and Geographic Information System (GIS) corporate data. Disturbance regime data is summarized from LANDFIRE GIS data (LANDFIRE 2014a, b) and GIS data sets showing forest insect and disease activity mapped from aerial detection surveys in the state of New Mexico from 1998 to 2012. According to the SMS Handbook, “An Ecological Unit Description (EUD)...represents the common starting point for SMS and for Ecosystem Planning. An objective description of the biological and physical elements is drawn from the EUD and combined with identified scenic character attributes to develop the Landscape [Scenic] Character Description.” (USDA FS 1995, 6). The ecological unit descriptions available for the area are at a larger scale than the Ecological Subsections.

TEAMS Enterprise Landscape Architect completed a site visit in June 2013. This site visit included field work to see current management activities and landscape attributes for completing the scenic character description. The landscape architect took photos to support the SMS inventory process. Most photos have a corresponding GPS point, which are shown in Figure 1.

The scenic character descriptions presented serve the purpose of establishing the current overall impression of a landscape, providing a reference from which to compare existing scenic character to desired scenic character, and providing a reference for changes in scenic character as the landscape progresses toward a scenic character goal. The scenic character descriptions presented in this document include both social and ecological components which discuss the existing

landscape attributes such as landform, vegetative pattern, water characteristics, and cultural features. The descriptions also provide information on how the landscape has developed over time. The social component and ecological component are summarized in the following categories:

Social Component categories:

- ◆ Valued Landscape Attributes
- ◆ Special or Distinctive Features
- ◆ Water Resources and Wild and Scenic Rivers
- ◆ Recreation Opportunities
- ◆ Culturally Valued Attributes

Ecological Component categories:

- ◆ Dominant Environmental Regimes
 - Geomorphology and Landforms
 - Climate
 - Surface Water Characteristics
 - Existing Vegetation
 - Potential Natural Vegetation
- ◆ Disturbance Regimes
- ◆ Human Caused Disturbance

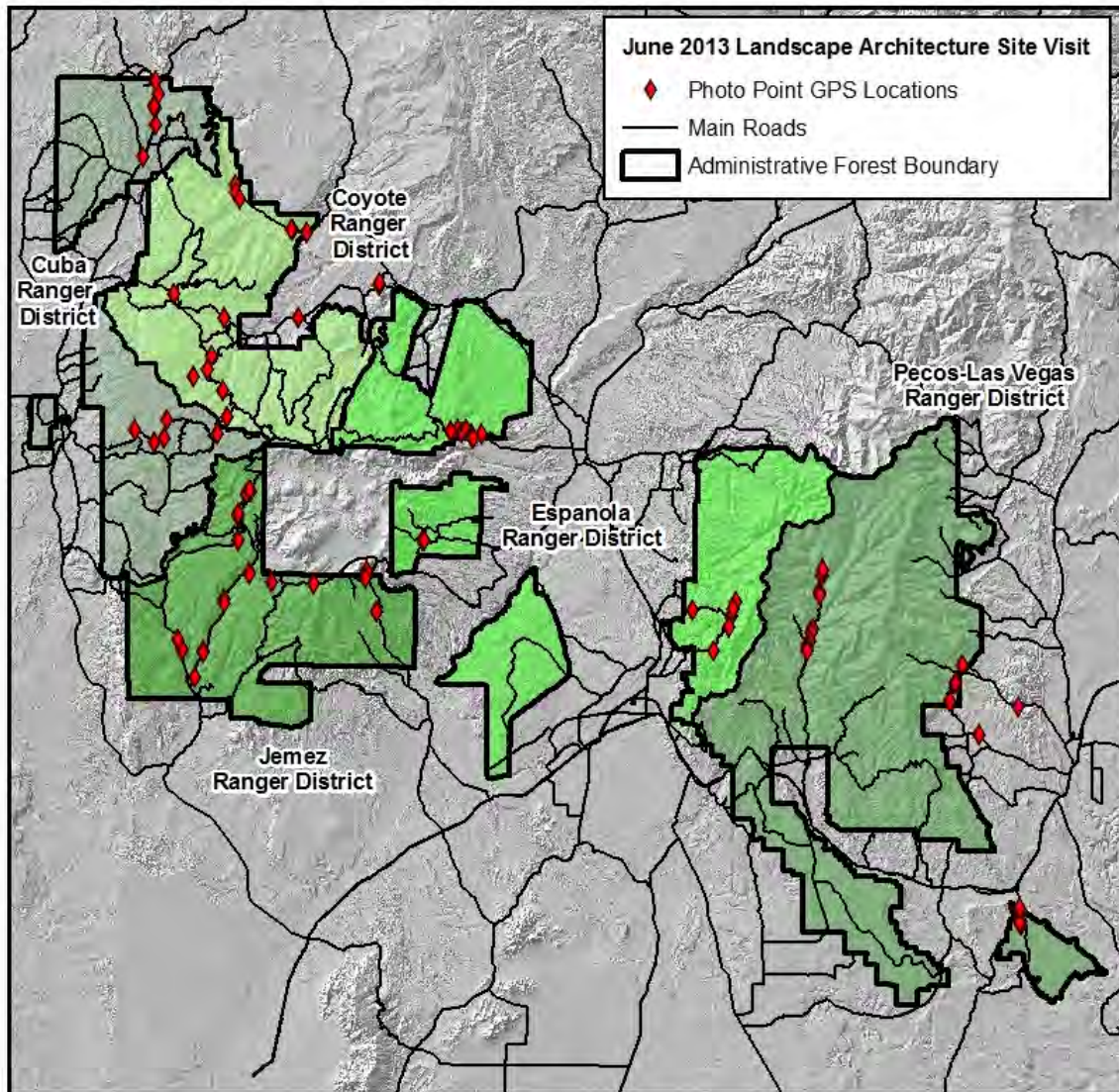


Figure 1. Landscape Architecture photo points map of the Santa Fe National Forest area

Santa Fe National Forest Existing Scenic Character

The existing scenic character describes the valued aesthetic attributes that express the positive image of the current landscape.

The Santa Fe National Forest is a recreation destination, attracting visitors from the local area, across New Mexico, bordering states, and across the country. The 1.6 million acre forest is located in north central New Mexico with elevations varying from 5,300 to 13,103 feet at Truchas Peak in the Pecos Wilderness. The Forest encompasses two units with varying landforms. East of the Rio Grande, the southern Sangre de Cristo Mountains dominate the landscape with snow covered peaks, including Truchas Peak. The headwaters of the Pecos River include magnificent forests of aspen, pine, fir and spruce and many trout streams. Sloping gradually southward, this unit includes the Santa Fe Ski Area, historic Glorieta Pass and the old Santa Fe Trail. West of the Rio Grande lie a cluster of ranges including the Jemez Mountains, which rise to nearly 12,000 feet at the summit of Chicoma Peak and over 10,000 feet in the San Pedro Park Wilderness. Scattered through these mountains are the national laboratory at Los Alamos, several Indian Pueblos, Bandelier National Monument, and Valles Caldera National Preserve, a volcanic caldera defined by the Valle Grande and the ring of mountains surrounding the valley (USDA FS 2012).

The Forest provides a visual backdrop to many communities, homes, and travel ways with a diversity of scenic landscape features including higher elevation spruce-fir forests, aspen adding vibrant gold during autumn, lush high mountain meadows filled with wildflowers, dramatic landforms with vibrant colors, brilliant red rock canyons and cliffs, sandstone bluffs, and mountain peaks. Grasslands, escarpments, rugged canyons, mesas, plateaus, rolling foothills and mountains, and mountain peaks provide a range of topography. The vegetative mosaic varies across the Forest with pinyon-juniper shrublands, grasslands, sagebrush shrublands, aspen, and conifer forests consisting mostly of ponderosa pine with mixed conifer and aspen forest and spruce-fir conifer forests at higher elevations in both the Sangre de Cristo and Jemez Mountains. People are drawn to the Santa Fe NF for its stunning views, diversity of scenic landscape features, and recreation opportunities. Workshop participants in determining values, attitudes and beliefs “describe forest aesthetics as a valued asset of the SFNF. A varied landscape, diverse vegetation, and snowcapped mountains contribute to a landscape that is described as inspirational and an asset to the setting and lifestyle of adjacent communities” (Russell and Adams-Russell 2005, 26).

Water is a precious and distinctive resource on the Forest. Perennial streams and cold and hot springs, such as Spence Springs and Seven Springs, and unique waterfalls, such as Jemez Falls, are popular recreation destinations. A few man-made lakes or reservoirs are scattered throughout the Forest, including Abiquiu Reservoir, Cochiti Lake, Santa Fe Lake, San Gregorio Lake, McClure Reservoir, and Cowles Ponds to name a few. The Forest has three nationally designated Wild and Scenic Rivers including: East Fork Jemez River, Pecos River and Rio Chama. These and other major streams flowing through the forest, including Rio Grande and Santa Fe River, provide aesthetic and recreational settings.

Heritage attractions abound with many prehistoric and historic sites from cave dwelling and pithouses to homesteads and schoolhouses and Civilian Conservation Corps (CCC) sites, providing richness in character and culture. Excellent wildlife viewing and hunting opportunities are found throughout the landscape. The Santa Fe NF is predominately a naturally appearing landscape with vegetation shaped by recent and historic fires. Winding through various parts of the forest, travelers enjoy viewing scenery and reliving history on scenic byways including the Santa Fe National Forest Scenic Byway and Jemez Mountain Trail National Scenic Byway in the

Jemez National Recreation Area. These routes and several National Recreation and Scenic Trails offer stunning views of the Forest and surrounding lands.

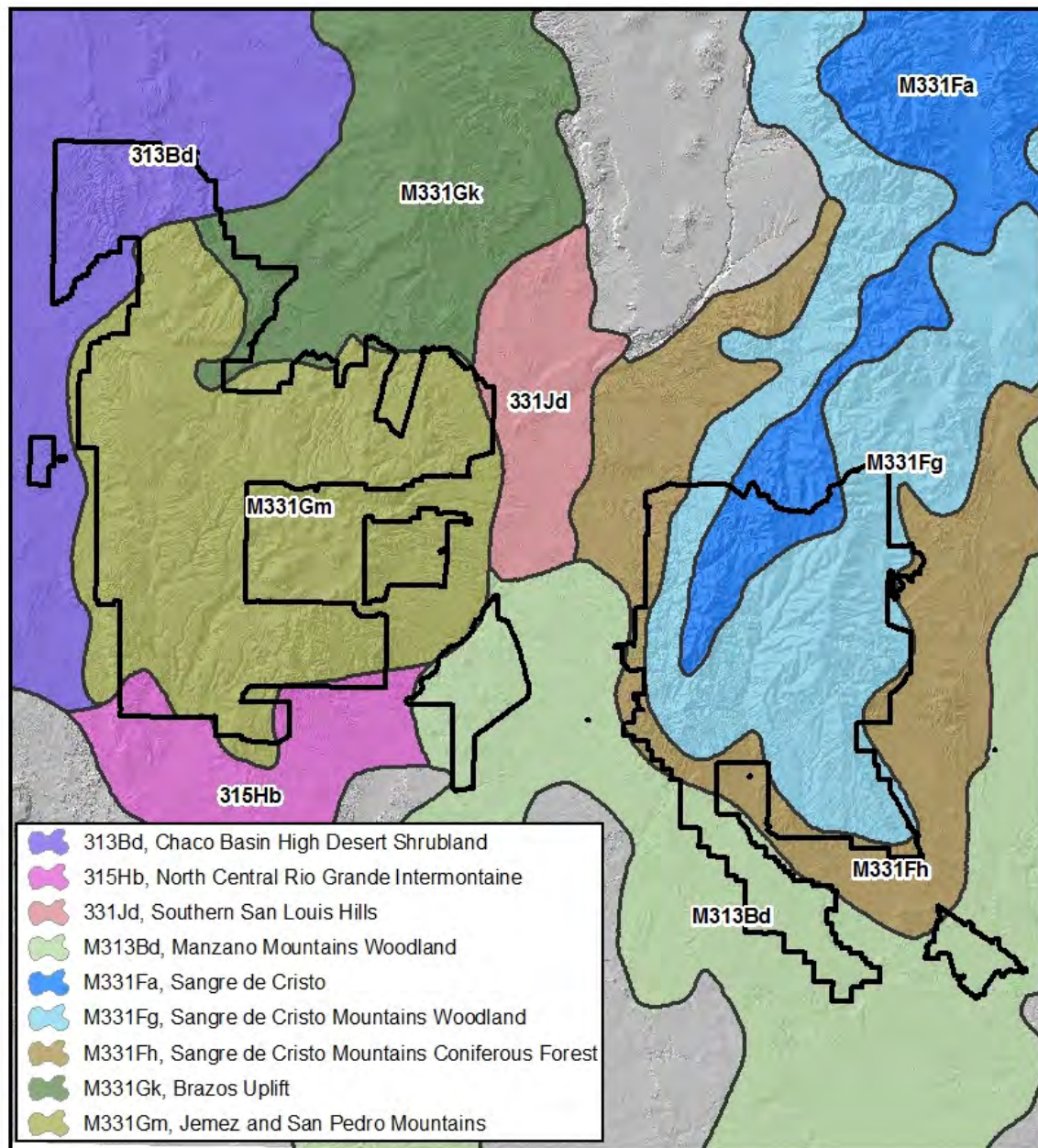


Figure 2. Santa Fe National Forest Ecological Subsections

The North Central Rio Grande Intermontaine (315Hb) and Southern San Louis Hills (331Jd) subsections comprise very little of the Santa Fe National Forest and will be covered in the scenic character description of an adjacent ecological subsection.

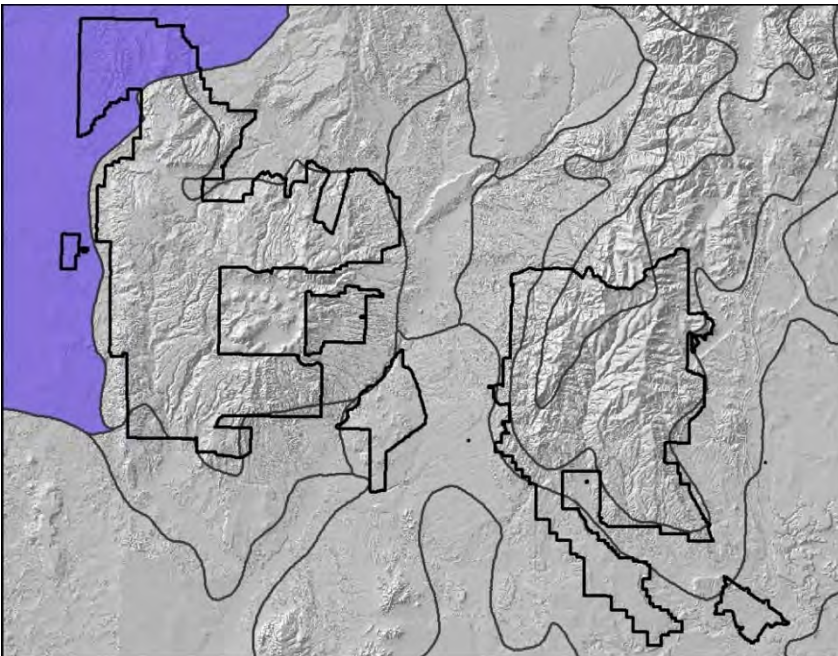
313Bd – Chaco Basin High Desert Shrubland Subsection

The description of this subsection will focus on the portion within the Santa Fe National Forest.

Social Component

Valued Landscape Attributes

This ecological subsection, located on the eastern edge of the Colorado Plateau physiographic province, covers the northern portion of the Cuba Ranger District, northern portions of the Coyote Ranger District, and the Mesa de Cuba unit west of Cuba. Rugged country, including distinctive escarpments and deep canyons with sheer cliffs, characterizes the area. The terrain is dominated by steeply sloping canyonlands and hogbacks where flat to gentle relief is limited to both broad and narrow canyon bottoms. Along NM Highway 112, which bisects the northern unit, broad sagebrush flats scattered with pinyon-juniper and ponderosa pine transition suddenly to steeply sloping hills, talus slopes, and escarpments with ponderosa pine. The Continental Divide passes through a portion of the Forest in this subsection. Steep escarpments and rock outcrops tend to be on east facing slopes while west facing slopes are less steep with vegetative cover. This portion of the subsection is best known for its prehistoric ruins and includes the northern portions of the Rio Chama Wild and Scenic River and Chama River Canyon Wilderness. Vegetative patterns include a mixture of pinyon-juniper and ponderosa pine with big sagebrush and other deciduous shrub mixes in bottomlands. Riparian vegetation is distinctive along Rio Chama and Rio Gallina, which runs along the southern border of the subsection. This vegetative mix provides habitat for a variety of wildlife species. The steep canyons, jutting escarpments, hogbacks, and sheer cliffs along with the riparian vegetation mix, when present, provide for distinctive scenic attractiveness.



Other landscape features and the vegetation mix have scenic attractiveness common to the landscape. Scenic viewing areas along NM Highway 112, lookouts, and overlooks into the Chama River Canyon and Corral Canyon allow for breathtaking, panoramic views of the area. Rio Chama, Rio Cebolla, and a portion of Cañada Ojitos are the only perennial streams; otherwise streams are intermittent or ephemeral.

Figure 3. 313Bd – Chaco Basin High Desert Shrubland Subsection



Figure 4. Sagebrush flats transitioning to steeper landforms in northern portion of the Forest

Special or Distinctive features

Steep and rocky escarpments with mostly eastern facing outcrops and steep canyons with rock outcrops are special or distinctive features throughout this subsection on the Forest. The northern portions of the Rio Chama Wild and Scenic River and Chama River Canyon Wilderness also occur in this subsection, but their features will be discussed more fully in the Brazos Uplift Subsection.



Figure 5. Escarpments viewed from NM Highway 112

Other special or distinctive features include:

- ◆ Prehistoric ruins, such as Nogales Cliff House and ruins at Rattlesnake Ridge. Nogales Cliff House is situated in an alcove formed by sandstone cliffs. This well-preserved ruin is a structure that was probably built around 1,000 A.D. by a Pueblo Indian Group specific to this area called the Gallina. Rattlesnake Ridge is the largest documented village site in the Gallina area. Extending more than half a mile along a ridge, the village comprises nine single unit dwellings, two multi-room structures, three towers, three pit houses, related storage rooms, and a reservoir system.



Figure 6. Ruins at Rattlesnake Ridge

- ◆ Spring Canyon and Corral Canyon, which can be viewed from an overlook on Deer Run Road (NFSR 310).
- ◆ Cuba de Mesa has mostly ponderosa pine vegetation with some sandstone canyons and rock outcrops, particularly a steep escarpment in southeast corner of island unit.
- ◆ Continental Divide, passing through the southwest portion of the northern unit of the Cuba Ranger District, is a special feature with common scenic attractiveness.



Figure 7. Nogales Cliff House

Water Resources and Wild and Scenic Rivers

Water is a valued resource within this subsection. Rio Chama, Rio Cebolla, and a portion of Cañada Ojitos are the only perennial streams. Other major intermittent streams include: Corral Canyon, Spring Canyon, Cañoncito de las Lleguas, Archuleta Arroyo, much of Cañada Ojitos, and Rio Gallina where it occurs in the subsection. Rio Chama is a nationally designated wild and scenic river with wild designation in this subsection. The Rio Chama Management Plan does not list the outstandingly remarkable values for this river (USDA FS 1990).

Recreation Opportunities

Recreation opportunities are primarily dispersed with a few recreation sites. Recreation sites with more development include Nogales Cliff House Interpretive Site and Rattlesnake Ridge Trailhead. Popular recreation activities include dispersed camping, hunting, hiking, horseback riding, motorized off-highway vehicle exploring on designated routes, and driving for pleasure on system roads. Back country camping and backpacking are available in Chama River Canyon Wilderness, Chama Wilderness inventoried roadless area, or Pollywog inventoried roadless area. Water rafting and primitive camping are popular along Rio Chama. The recreation opportunities of the Rio Chama National Wild and Scenic River and Chama River Canyon Wilderness will be discussed more fully in the Brazos Uplift Subsection. When snow is present, cross-country skiing and snowmobiling are also popular.

Driving for pleasure and viewing scenery is popular along NM Highway 112, which bisects the northern portion of the Cuba Ranger District. Popular trails include: Hart Canyon (T293) in Chama River Canyon Wilderness, Rattlesnake Trail (T48) to prehistoric ruins, Nogales Trail (T47) to Nogales Cliff House Interpretive Site, and several motorized trails off of Cuba Mesa Road (NFSR 88) in the Mesa de Cuba unit.

Several lookouts and peaks provide for panoramic scenery viewing opportunities: Deadman Lookout, Gallina Peak, overlook at Corral Canyon, and Wolf Draw Electronic Site. Multiple overlooks on system roads provide breathtaking views of Chama River Canyon. Roads with these overlooks include: Chama Vista Road (NFSR 503), Gallina Mountain Road (NFSR 6), Dark Canyon Vista Road (NFSR 504), and Burkes Road (NFSR 505KE).

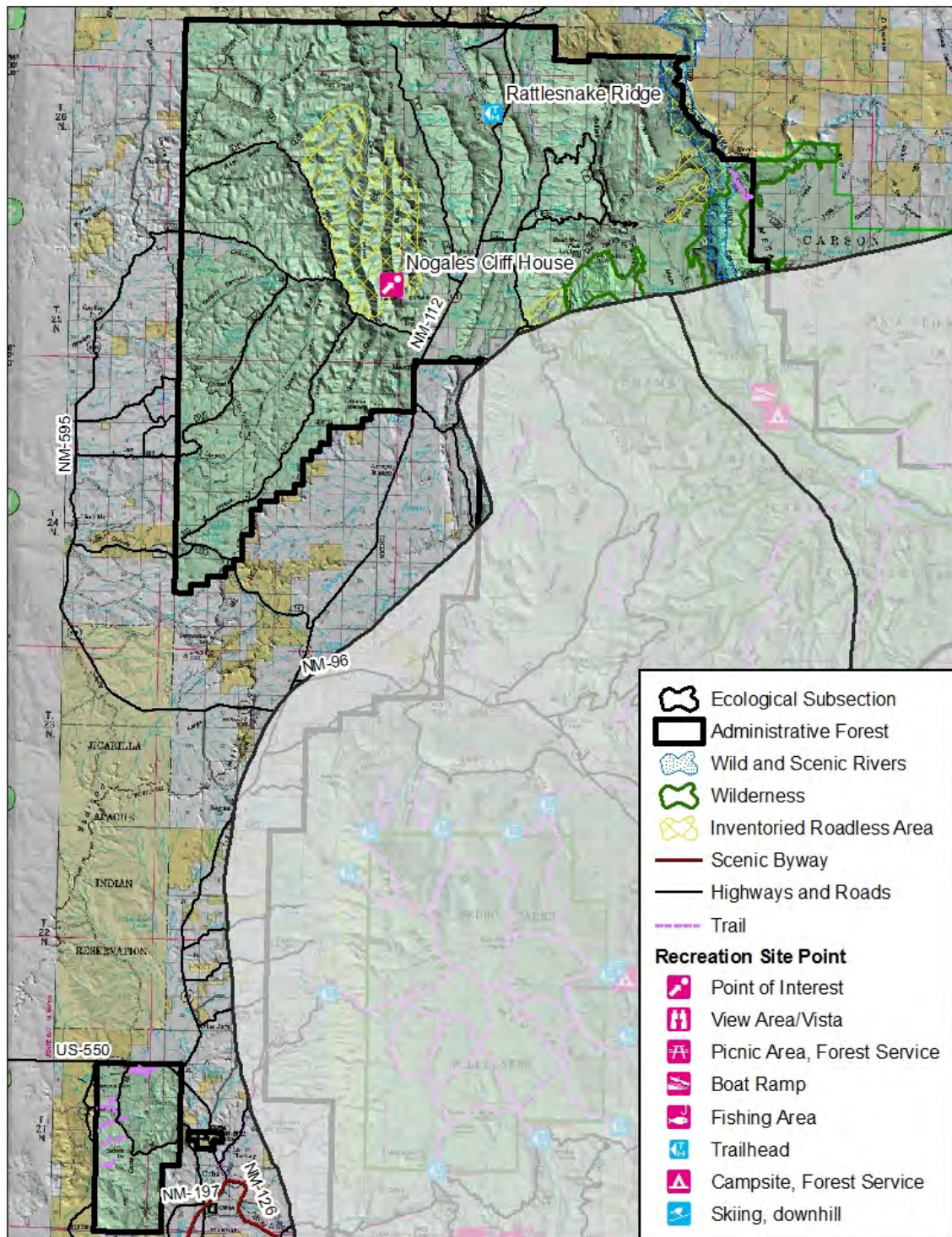


Figure 8. Recreation Opportunities Map for the Chaco Basin High Desert Shrubland Subsection

Cultural Ecology

Families have lived off the land for many generations. Local communities still use the land for cattle and sheep grazing and agricultural needs. The Jemez, Zia, and Jicarrilla Apache Pueblos neighbor the Cuba Ranger District and are closely tied to the natural resources of the land for a number of activities and uses (USDA FS 2014b).

The ecological section description covers an area larger than this scenic character description and includes a section on cultural ecology. McNab and Avers (1994a) describe the cultural ecology over thousands of years starting with Paleo-Indian and Archaic hunting and gathering people to pueblo populations at Hopi, Zuni, and along the Rio Grande to Navajo and Apache and Ute peoples using the area for hunting, gathering, and some horticulture to early Spanish contact.

“Eventually, much of this Section was included in the Hopi and Navajo Reservations.

Overgrazing by sheep and a natural period of down cutting around the turn of the century contributed to the erosional characteristics visible today. Coal, oil, and gas resources in the northern portions of the Section have been exploited in boom-and-bust cycles. Today the area is largely rural, with a few sizable towns. Grazing, agriculture, mineral development, and tourism contribute to the economy. The Four Corners area offers unsurpassed scenic and heritage values.” (McNab and Avers 1994a).

Ecological Component

Included in the Navajo Canyonlands Ecological Section (313B), this subsection is located in north central New Mexico in the Colorado Plateau Semidesert physiographic province. The Chaco Basin High Desert Shrubland Ecological Subsection (313Bd) within the Santa Fe National Forest includes over 30 Terrestrial Ecological Unit (TEU) map units and the following GTES map units: 122, 135, 137, 139, 160, 161, 176, 421, and 441. The ecological component below is summarized from Ecological Subregions of the United States (McNab and Avers 1994a), Ecological Subregions: Sections of the Conterminous United States (McNab et al. 2005), Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991).

Dominant Environmental Regimes

Landform/ Geomorphology

Navajo Canyonlands ecological section is in the northeast part of Arizona, southeastern Utah, southwestern Colorado, and northwestern New Mexico (USDA FS 1989). Geomorphic processes active in this ecological section are deep canyon formations as the result of plateau dissection. This section has a high-elevation plateau with occasional volcanic mountains. Major landforms consist of canyonlands, plateaus, plains, and hills (McNab et al. 2005). The area is characterized by horizontal sandstone beds that have been subject to great erosion creating tablelands, cuestas, rock terraces, retreating escarpments, canyons, and dry washes (USDA FS 1989).



Figure 7. Landforms in the northern portion of the subsection

General Ecosystem Survey characterizes the landforms on the Forest as valley plains, elevated plains, hills, hills and mountains, mountains, and escarpments. Major landforms within the Forest include Continental Divide, Gallina Mountain, Gallina Peak, Deadman Peak, Chama River Canyon, Corral Canyon, Spring Canyon, Mesa Golondrina, Mesa de Cuba, and other unnamed hogbacks and escarpments. Elevation ranges from 4,000 to 8,000 feet (1,210 to 2,425 meters) (McNab and Avers 1994a).

Table 1: Landforms by General Ecosystem Survey map units for the Chaco Basin High Desert Shrubland Subsection

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
122	elevated plains, valley plains
135	elevated plains
137	mountains, escarpments
139	elevated plains, hills/mountains
160	elevated plains
161	hills/mountains
176	elevated plains, hills/mountains
421	hills, elevated plains, escarpments
441	valley plains

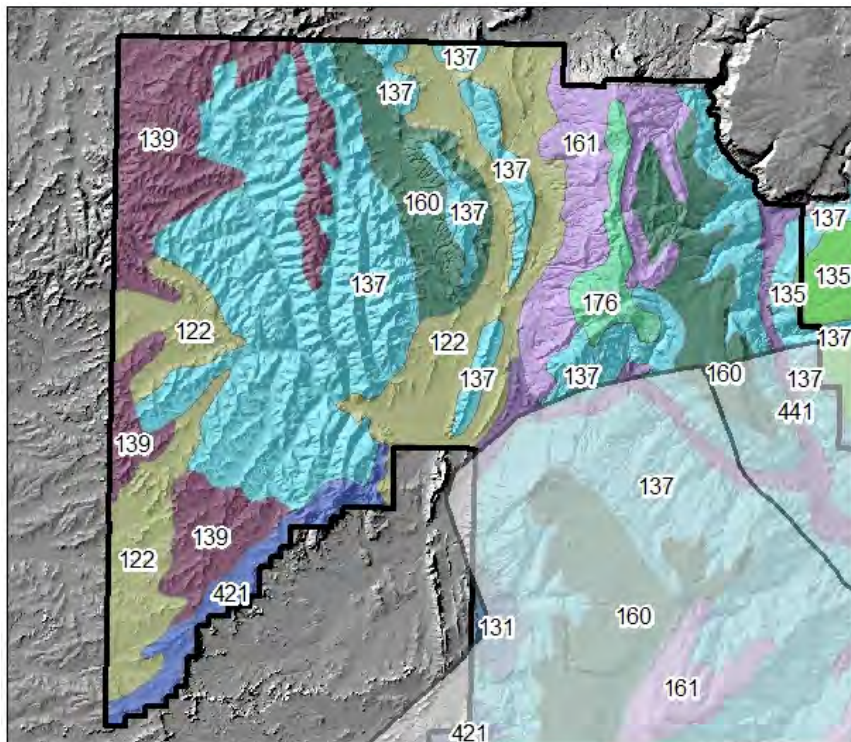
**Figure 9. General Ecosystem Survey map units of the Chaco Basin High Desert Shrubland Subsection. GES map unit 137 covers all of Cuba de Mesa.**



Figure 10. Landforms in the northern portion of the subsection



Figure 11. Landforms west of Rattlesnake Ridge

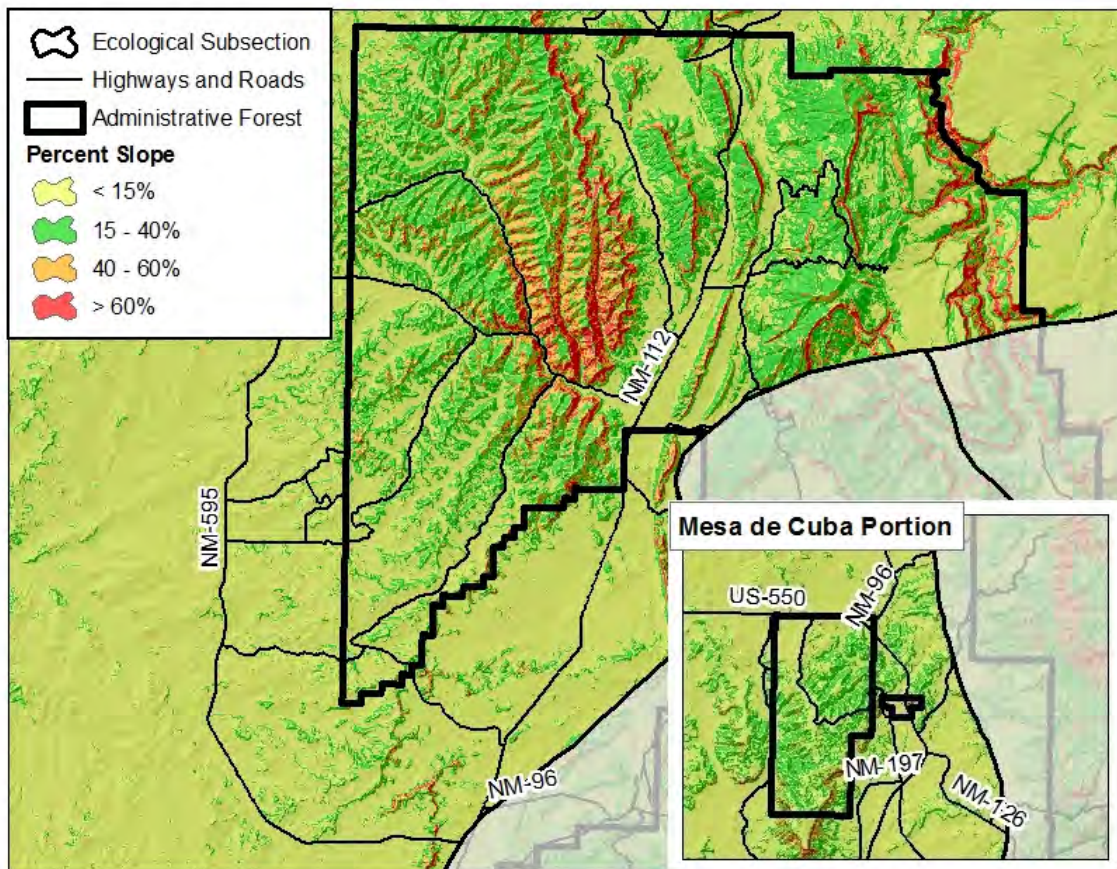


Figure 12. Topography map using percent slope for the Chaco Basin High Desert Shrubland Subsection

Climate

Precipitation ranges from 8 to 18 inches (200 to 458 millimeters) annually, with more than half of the precipitation falling during the winter. Temperature averages 45 to 57 °F (7 to 13 °C) and winters are cold. The growing season lasts 110 to 180 days (McNab and Avers 1994a).

Surface Water Characteristics

Water is scarce in the subsection on the Forest. Perennial streams include: Rio Chama, Rio Cebolla, and a portion of Cañada Ojitos. Rio Chama is a nationally designated wild and scenic river. Many intermittent streams are found throughout, and few natural or artificial lakes are located within the Forest in this subsection. Laguna Seca, when water is present, would be considered distinctive due to its size.

Existing Vegetation

The vegetation within NFS lands varies across the subsection depending on elevation, aspect, and soils influencing vegetative patterns. At a broad scale, pinyon-juniper woodland, ponderosa pine mix, plains grassland, saltbush, and sagebrush dominate most of the area. Stringers of riparian deciduous forest and woodland occur along water courses. Vegetation can be open to sparse with bare soil and bare rock common (USDA FS 1989).

The vegetation types at the midscale level are discussed by dominance type. Most of the area is dominated by ponderosa pine forest mix and pinyon-juniper woodlands both intermixed. Big sagebrush, deciduous shrub mix, and perennial grasses dominate flats and lowlands. Ponderosa pine is mixed in pinyon-juniper at lower elevations and other pines, spruce and fir at higher elevations. Higher elevations have a mix of upper deciduous-evergreen forest in the canyons west of NM Highway 112 and higher elevations east of NM Highway 112. Vegetation in broad bottomlands transition to woodlands and forest abruptly where sudden changes in landform occur. Vegetation can be sparse on east facing escarpments and talus slopes. Riparian vegetation along Rio Chama, Rio Gallina, and Cañada Ojitos add distinctive textures and colors in the fall. A figure on the next page depicts the most prominent existing vegetation using midscale vegetation mapping dominance types.



Figure 13. Vegetation occurring in the northern portion of the subsection along NM Highway 112



Figure 14. Vegetation occurring in the northern portion of the subsection along NM Highway 112

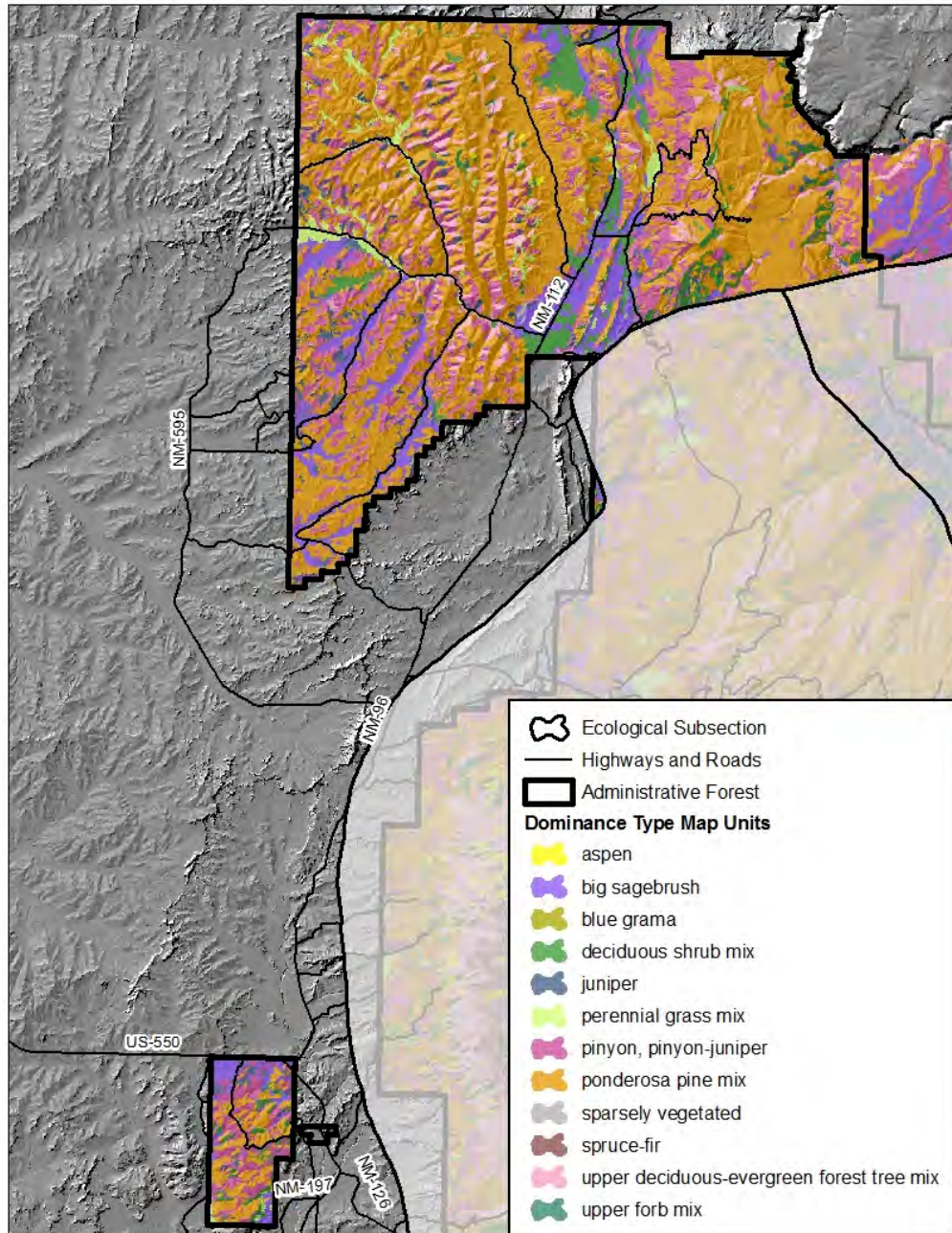


Figure 15. Midscale Vegetation Dominance Types for the Chaco Basin High Desert Shrubland Subsection

Potential Natural Vegetation

At a broad scale, vegetation consists of pinyon-juniper woodlands at higher elevations. Grama and galleta grasses are found at lower elevations; greasewood and saltbrush are found on calcareous and salt affected soils (McNab and Avers 1994a).

Potential Natural Vegetation types are depicted with Terrestrial Ecosystem Survey vegetation types, as shown in the following figure. Several vegetation communities occur on NFS lands within this subsection. Most of the area is dominated by ponderosa pine with pinyon-juniper woodlands at lower elevations and spruce, fir, and bristlecone pine at higher elevations. Sagebrush and rabbitbrush types occur on broad and narrow flats between mountains. Alder, cottonwood, and willow occur in along drainage bottoms of Rio Chama, Rio Gallina, Cañoncito de las Lleguas, and Laguna Seca,

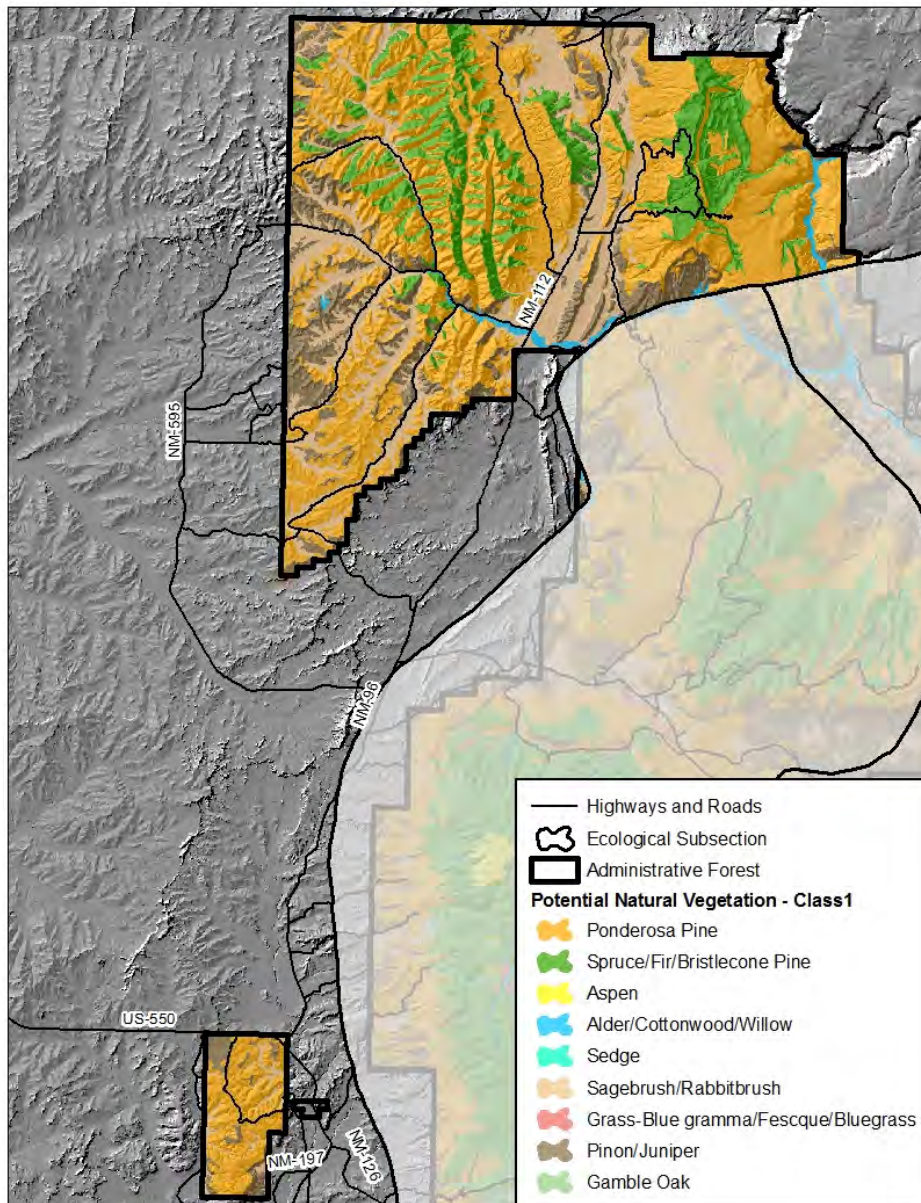


Figure 16. Terrestrial Ecosystem Survey Vegetation Types for the Chaco Basin High Desert Shrubland Subsection

Disturbance Regimes

Across the ecological section, fires are variable in frequency and intensity. Flash floods and drought are common (McNab and Avers 1994a). Wildfires vary in frequency and intensity within the vegetation type represented in this ecological subsection. Fires also vary in frequency and intensity, depending on fuel load and moisture. In most cases, historic occurrence has changed from frequent, low intensity, ground fires to infrequent, high intensity, stand replacing fires. However, no large fires have occurred in this subsection. The historic fire regime over much of the area in pinyon-juniper and ponderosa pine dominated areas is 35 to 200 year fire return interval with low and mixed severity. Some ponderosa pine areas have a fire regime group of less than 35 year fire return interval with low and mix severity. Sagebrush dominated areas have a 35 to 200 year fire return interval with replacement severity (LANDFIRE 2014a). The vegetation within this subsection is mostly moderate departure with low departure in lowlands from these fire regime groups, depending on the vegetation communities present (LANDFIRE 2014b). Several fires, each under 600 acres, have shaped the landscape setting in this ecological subsection. Other natural disturbances include insect and disease risk in upper deciduous and evergreen mix and ponderosa pine mix vegetation types with mortality from Douglas-fir beetle and fir engraver.

The Forest continues to feel the effects of drought conditions. Below average precipitation causes increased stress on trees which can make them more susceptible to insect and disease and increase severity and intensity of wildfires. Drought conditions also affect availability of water resources, which are highly sought by recreationists as well as wildlife.

Human Caused Disturbance

Management activities include livestock grazing, vegetation management to improve range condition, other vegetation and timber management, prescribed fire activity, oil and gas development, communication sites, utilities, travel management, and dispersed recreation use including but not limited to camping, hunting, hiking, and motorized use.

Livestock grazing occurs throughout with noticeable changes to the landscape when looking at grazed and ungrazed grasses, range fences, livestock trails, and water developments. Vegetation management to improve range condition may include prescribed fire, herbicide treatment or other mechanical vegetation manipulations. These management activities may be noticeable when viewed in the foreground distance zone, but typically do not dominate the landscape. These types of activities occur in an overall naturally appearing landscape with minor deviations when structures or developments are viewed.

Various vegetation management activities are scattered throughout the subsection with regeneration, intermediate and selective harvest types with both commercial and pre-commercial components. Regeneration harvest types can sometimes dominate the landscape depending on shape and concentration of harvest units and concentration of roads. The landscape appears slightly altered from these activities in this subsection. Most intermediate and selective harvest prescriptions are not noticed by forest visitors once slash disposal has occurred and skid trails are revegetated. Pre-commercial vegetation treatments are often not noticeable once slash disposal has occurred or lop and scatter slash begins to blend with the surrounding vegetation.

The effects of prescribed fire on the landscape are naturally appearing since fire edges typically follow natural vegetative patterns and terrain features. The effects of prescribed fire typically go unnoticed by forest visitors after a few years, depending on project objectives and amount of moisture received.

The northern portion of the subsection on Forest has oil and gas development. These activities are scattered across the landscape, borrow colors from the landscape for facilities and blend with the topography of the area.



Figure 17. Oil and gas activity, an example of moderate existing scenic integrity

Communication sites and utilities are the most noticeable alterations in this landscape when they are viewed. Communication sites with multiple towers may dominate a view due to the strong linear features added to the landscape above a shrub or tree canopy and landform features and vegetative clearing for facilities.

Smaller capacity utility lines are located throughout the subsection. Structures are mostly one or two wooden poles and do not dominate landscape views. Where vegetative clearing is not needed or minimized, these activities result in a landscape which generally appears slightly altered. One major power lines crosses the forest in this subsection. Major utility corridors often dominate the landscape when viewed either with large vertical structures or vegetative clearing making the landscape appear heavily altered. Where vegetative clearing is not needed or minimized, these activities result a landscape which generally appears moderately altered.

Within this subsection, most roads present are suitable for high clearance vehicles only. Roads more easily traveled, suitable for passenger cars, provide access throughout the subsection and include: US and State Highways such as NM Highway 112, County Roads, and main NFS roads. Some of the main NFS roads providing access include: Archuleta Road (NFSR 7), Gallina Mountain Road (NFSR 6), Mud Springs Road (NFSR 5), Lleguas Road (NFSR 313), and Wolf Draw Road (NFSR 312). These roads, secondary roads, motorized trails, and non-motorized trails are the primary access and platform for viewing scenery and may occur in otherwise naturally appearing landscapes.

Dispersed recreation, primarily in the forms of dispersed camping, hunting, hiking, and motorized use occur across the area. The landscape appears unaltered from these activities.

M313Bd – Manzano Mountains Woodland

The description of this subsection will focus on the portion within the Santa Fe National Forest.

Social Component

Valued Landscape Attributes

This ecological subsection covers the southern portion of the Pecos/Las Vegas Ranger District and a portion on the Española Ranger District. Three units this subsection on the Forest: Caja del Rio Plateau, Glorieta Mesa, and Anton Chico. The terrain is characterized by broad plateaus and mesas with flat to rolling relief edged with escarpments or steep river canyons. The Rio Grande and White Rock Canyon is the northeastern boundary of Caja del Rio Plateau. Vegetative patterns on Caja del Rio Plateau are a mixture of juniper, big sagebrush, grasses, and some pinyon juniper. Glorieta Mesa is characterized by gentle relief and a steep escarpment that runs along the northeastern boundary. Vegetative patterns in this area are a mixture of pinyon-juniper, ponderosa pine, and perennial grasses. Anton Chico has vegetative patterns of juniper, pinyon-juniper, and perennial grasses, and Pecos River provides the southern boundary of the unit. Anton Chico also includes the Mesita de los Ladrones Natural Area. The vegetative mix including riparian areas provides habitat for a variety of wildlife species. The El Camino Real National Scenic Byway, Route 66 pre-1937 alignment National Scenic Byway, Santa Fe Trail National Scenic Byway, and Turquoise Trail National Scenic Byway pass through this subsection off Forest. This portion of the subsection is best known for its dispersed recreation, scenic byways, and livestock grazing potential. Riparian vegetation is distinctive along Rio Grande, Santa Fe River, and Pecos River. The steep walled canyons and rivers provide for distinctive scenic attractiveness. Other landscape features and the vegetation mix have scenic attractiveness common to the landscape. Rio Grande, Santa Fe River, Pecos River, Canada Ancha, and Barbero Canyon are the only perennial streams; otherwise, streams are intermittent or ephemeral.

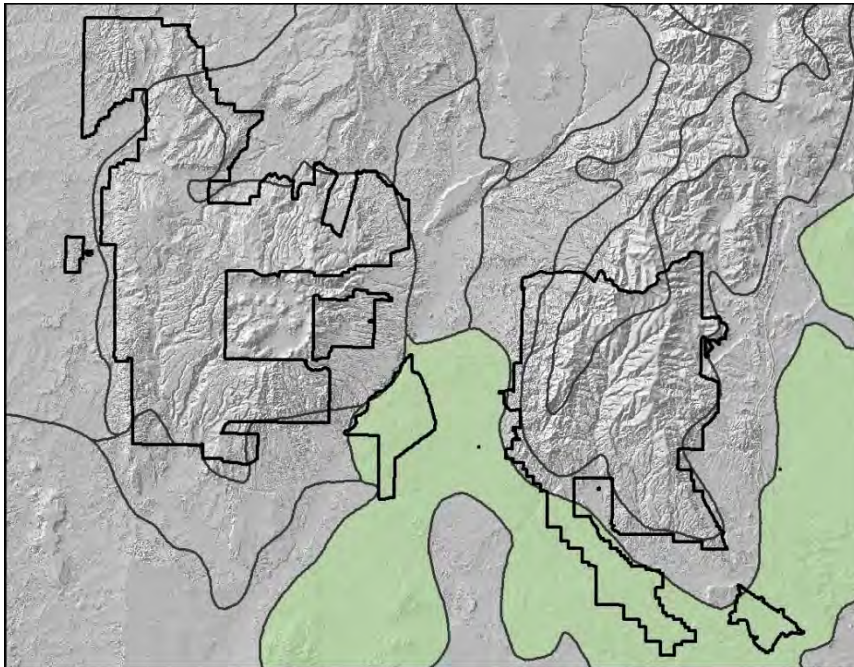


Figure 18. M313Bd – Manzano Mountains Woodland Subsection Map

Special or Distinctive features

The Rio Grande flows through White Rock Canyon, which provides scenic vistas and has a depth of up to 1,000 feet. Cochiti Reservoir makes up the southern portion of the Rio Grande drainage in this area. Buckman Crossing on the Santa Fe National Forest is the only place with vehicle access to the Rio Grande.

Other Special or distinctive features include:

- ♦ The Santa Fe River cuts another deep canyon along the southern edge of the Caja del Rio Plateau.
- ♦ Mesita de los Ladrones Natural Area in the Anton Chico unit is comprised of about 500 acres of Juniper Savannah
- ♦ El Camino Real National Scenic Byway, , Route 66 pre-1937 alignment National Scenic Byway, Santa Fe Trail National Scenic Byway, and Turquoise Trail National Scenic Byway pass through the subsection off Forest providing cultural landscape and scenery viewing opportunities

Water Resources

Water is a valued resource within this subsection. Rio Grande, Santa Fe River, and Pecos River, Canada Ancha, and Barbero Canyon are the only perennial streams. Tecolote Creek, an intermittent stream, runs east of Anton Chico. Cochiti Reservoir is a distinctive waterbody located within the subsection. Other waterbodies with the subsection are ponds and tanks.

Recreation Opportunities

Recreation opportunities are primarily dispersed. No developed recreation sites are located on Forest within the subsection. Popular recreation activities include dispersed camping, hunting, hiking, horseback riding, motorized off-highway vehicle exploring on designated routes, and driving for pleasure on system roads. Caja inventoried roadless area offers a more primitive dispersed recreation experience. Caja del Rio Plateau has the only system trails: Soda Springs (T306) and a trail off Dead Dog Well (T301).

Driving for pleasure and viewing scenery and cultural landscapes is popular along four national scenic byways which pass through this subsection off Forest.

- El Camino Real Scenic Byway follows the Rio Grande and the I-25 corridor north and southwest of Santa Fe. This byway offers diverse history and scenery and is also designated El Camino Real de Tierra Adentro National Historic Trail
- Route 66 pre-1937 alignment National Scenic Byway allows travelers to experience a unique cultural landscape full of the charm and history of the 1950s and 1960s. People from across the country and all over the world experience the American spirit and open road of Historic Route 66 (USDOT FHA 2015b). The historic route runs parallel to Interstate 25 (I-25) and travels through the Pecos/Las Vegas RD, traveling close to the Pecos River at various points.
- The Santa Fe Trail National Scenic Byway, one of the first trade routes, travels east of Santa Fe following New Mexico State Highways and US Highways. Travelers can visit historic sites and landmarks and enjoy spectacular scenery, from rugged mountains to plains (USDOT FHA 2015c). The route is also designated as a National Historic Trail
- Turquoise Trail National Scenic Byway, believed to be an ancient path, travels between Albuquerque and Santa Fe on New Mexico State Highways (USDOT FHA 2015d).

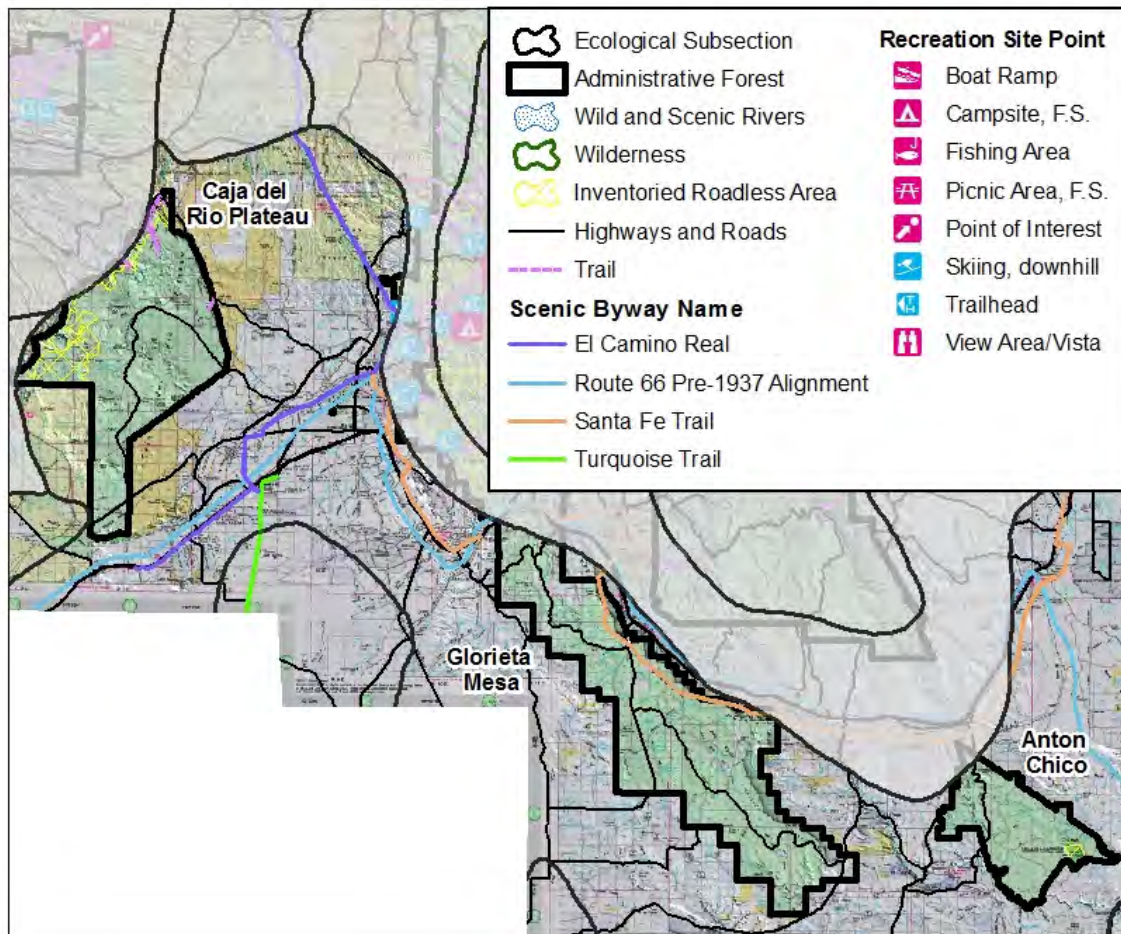


Figure 19. Recreation Opportunities Map for the Manzano Mountains Woodland Subsection

Cultural Ecology

The ecological section description covers an area larger than this scenic character description and includes a section on cultural ecology. McNab and Avers (1994b) describe the cultural ecology over thousands of years. In summary, the earliest human occupation of the Section was characterized by an emphasis on big game hunting supplemented with gathering wild plant foods. Villages tended to be located close to water in the pinon-juniper woodland and lower alluvial fans at the base of the mountains. Today, Native Americans continue to use the mountains for gathering and ceremonial purposes. In more recent history, McNab and Avers (1994b) describe uses as follows:

Beginning in the late 1800's, discoveries of gold and an increase in European settlement throughout the mountains resulted in more intensive use of the higher elevations for mining, logging, and ranching activities. Most of the homesteads and villages were located in the larger valleys or on the eastern slopes of the mountains near permanent water sources. By the turn of the century, logging dominated the activities in the mixed conifer zone, with ranching still playing an important role throughout the mountains. Currently, the area continues to consist primarily of small rural communities, with logging, fuel wood gathering, ranching, hunting, and recreation as the primary subsistence base. Anglo, Hispanic, and Mescalero Apache cultures are present.

Recreational use has increased dramatically over the past few decades, particularly near the larger cities

Ecological Component

Included in the Sacramento-Manzano Mountains Ecological Section (M313B), this subsection is located in north central New Mexico in the Basin and Range physiographic province. The Manzano Mountain Woodland Ecological Subsection (M313Bd) within the Santa Fe National Forest includes about 30 Terrestrial Ecological Unit (TEU) map units and the following GTES map units: 130, 131, 132, 135, 136, 160, 352, 433, 434, and 440. The ecological component below is summarized from Ecological Subregions of the United States (McNab and Avers 1994b), Ecological Subregions: Sections of the Conterminous United States (McNab et al. 2005), Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991).

Dominant Environmental Regimes

Landform/ Geomorphology

Sacramento-Manzano Mountains Ecological Section is located in central and south central in the New Mexico. This ecological section has landforms of moderate-elevation mountains, hills, plains, and scarps. Rocks are sedimentary and igneous in origin (McNab et al. 2005). This subsection is part of three character types described in Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989): eastern Mexican Highlands, Sacramento, and Pecos Valley.



Figure 20. Landforms viewed from Anton Chico near NFSR 85. Starvation Peak to the right and Glorieta Mesa in the distance

General Ecosystem Survey describes the landforms on the Forest as elevated plains, hills, hills and mountains, mountains, and escarpments. Areas on the Forest are characterized by broad plateaus and mesas with flat to rolling relief edged with escarpments or steep river canyons. Major landforms within the Forest include Caja del Rio Plateau, Glorieta Mesa, Anton Chico.

- Caja del Rio Plateau is bound by White Rock Canyon of the Rio Grande on the northeast, Canada Ancha on the east, and the Santa Fe River canyon on the south. Caja del Rio Plateau has generally flat to rolling terrain with numerous steep peaks rising above the plains. Prominent peaks include: Cerro Micho, Montoso Peak, Ortiz Mountain, and Cerro Rito.
- Glorieta Mesa is characterized by gentle relief and a steep escarpment that runs along the northeastern boundary. The escarpment on the mesa edges is a major landform noticed while traveling along Interstate 25. Other landforms on Glorieta Mesa include: Rowe Peak, Punta Pajarita, Valle Grande, and Hurtado Mesa.

- Anton Chico has low relief, rolling hills and is bound by Pecos River on the southern end. Starvation Peak is a prominent landform in this area.

Table 2: Landforms by General Ecosystem Survey map units for the Manzano Mountains Woodland Subsection

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
130	elevated plains
131	hills/mountains
132	hills/mountains, mountains, escarpments
135	elevated plains
136	hills/mountains
160	elevated plains
352	hills/mountains, mountains, escarpments
433	elevated plains
434	hills, elevated plains, escarpments
440*	valley plains

*Located on southern boundary of Caja del Rio Plateau unit along the Santa Fe River

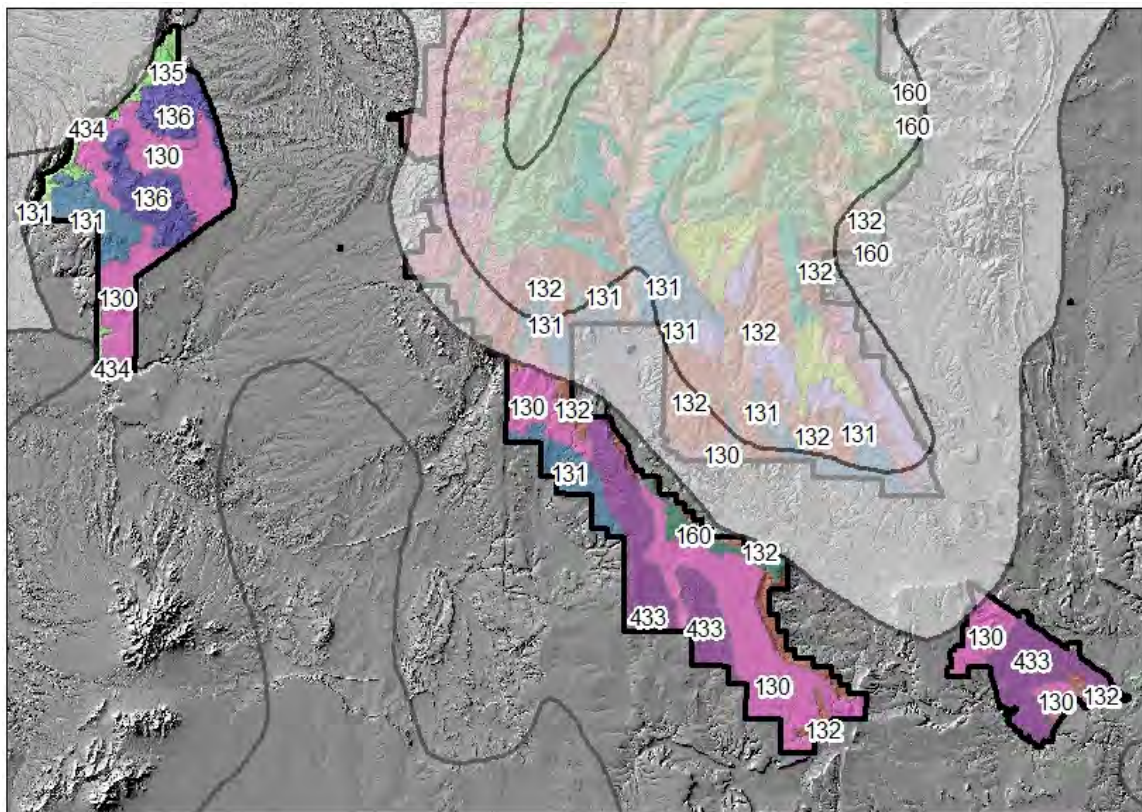


Figure 21. General Ecosystem Survey map units of the Manzano Mountains Woodland Subsection.

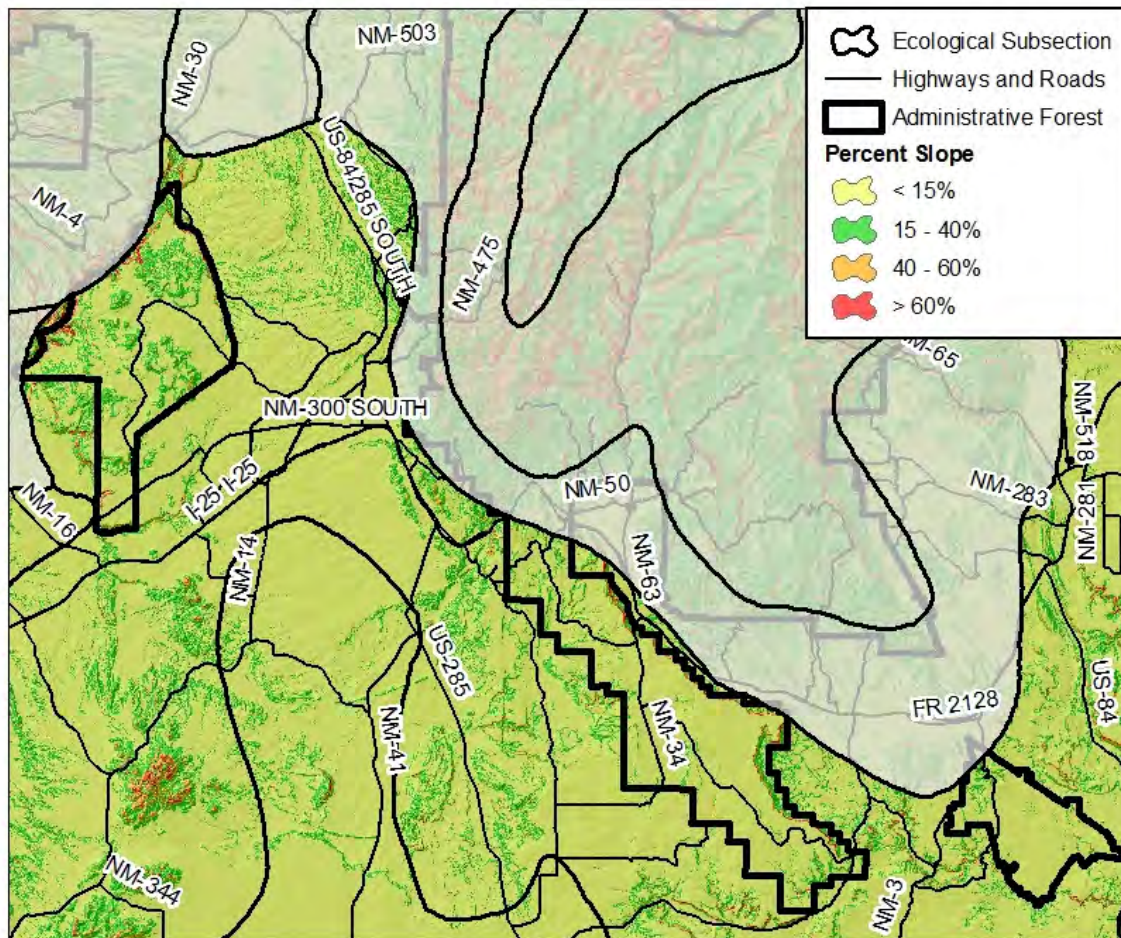


Figure 22. Topography map using percent slope for the Manzano Mountains Woodland Subsection.

Climate

Precipitation ranges from 12 to 35 inches (305 to 900 millimeter), with less than half of the precipitation falling during the winter. Temperature averages 40 to 57 °F (4 to 8 °C); winter temperatures vary throughout this section. The growing season lasts less than 70 to 170 days. (McNab and Avers 1994b).

Surface Water Characteristics

This section supplies much of the water to the Rio Grande and Pecos Valley basins. (McNab and Avers 1994b). Rio Grande, Santa Fe River, and Pecos River, Canada Ancha, and Barbero Canyon are the only perennial streams. Tecolote Creek, an intermittent stream, runs east of Anton Chico. Other streams are ephemeral. Waterbodies are few and are mostly ponds or tanks. Cochiti Reservoir, a prominent waterbody, is used for recreation, flood control, and irrigation (USDA FS 1989).

Existing Vegetation

The vegetation within NFS lands varies across the subsection depending on elevation, aspect, and soils influencing vegetative patterns. At a broad scale, vegetation consists of pinyon-juniper and southwestern shrub-steppe cover types (McNab et al 2005). Stringers of riparian deciduous vegetation occur along water courses.

The vegetation types at the midscale level are discussed by dominance type. Caja del Rio Plateau is dominated by a mixture of juniper, big sagebrush, perennial grasses, blue grama, and some pinyon juniper in the central portion of the unit. Glorieta Mesa is dominated by a mixture of pinyon-juniper, and perennial grasses with ponderosa pine mix in the north and eastern portions of the unit. Anton Chico has vegetation dominated by perennial grasses and juniper with some pinyon-juniper. Riparian vegetation along Rio Grande, Santa Fe River, and Pecos River add distinctive textures and colors in the fall. The following figure depicts the most prominent existing vegetation using midscale vegetation mapping dominance types.

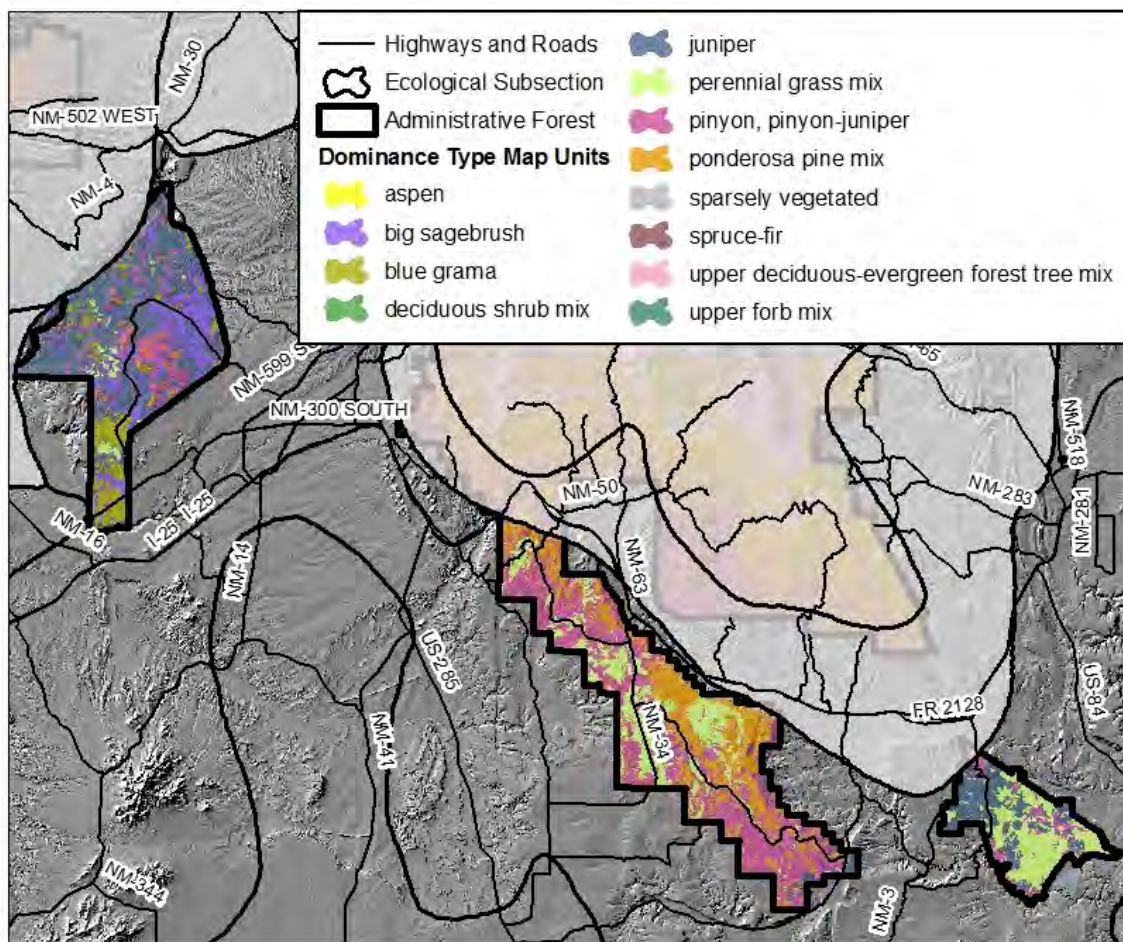


Figure 23. Midscale Vegetation Dominance Types for the Manzano Mountains Woodland Subsection.

Potential Natural Vegetation

At a broad scale, vegetation consists of ponderosa pine, Douglas-fir, and pinyon-juniper. A few areas may support grey oak at the lowest elevations. (McNab and Avers 1994b)

Potential Natural Vegetation types are depicted with Terrestrial Ecosystem Survey vegetation types, as shown in the following figure. Several vegetation communities occur on NFS lands within this subsection. Most of the area is dominated by pinyon-juniper with grasslands of glue grama, fesque, and bluegrass. Ponderosa pine occurs on Glorieta Mesa. Sagebrush and rabbitbrush occur in Anton Chico on flats and washes.

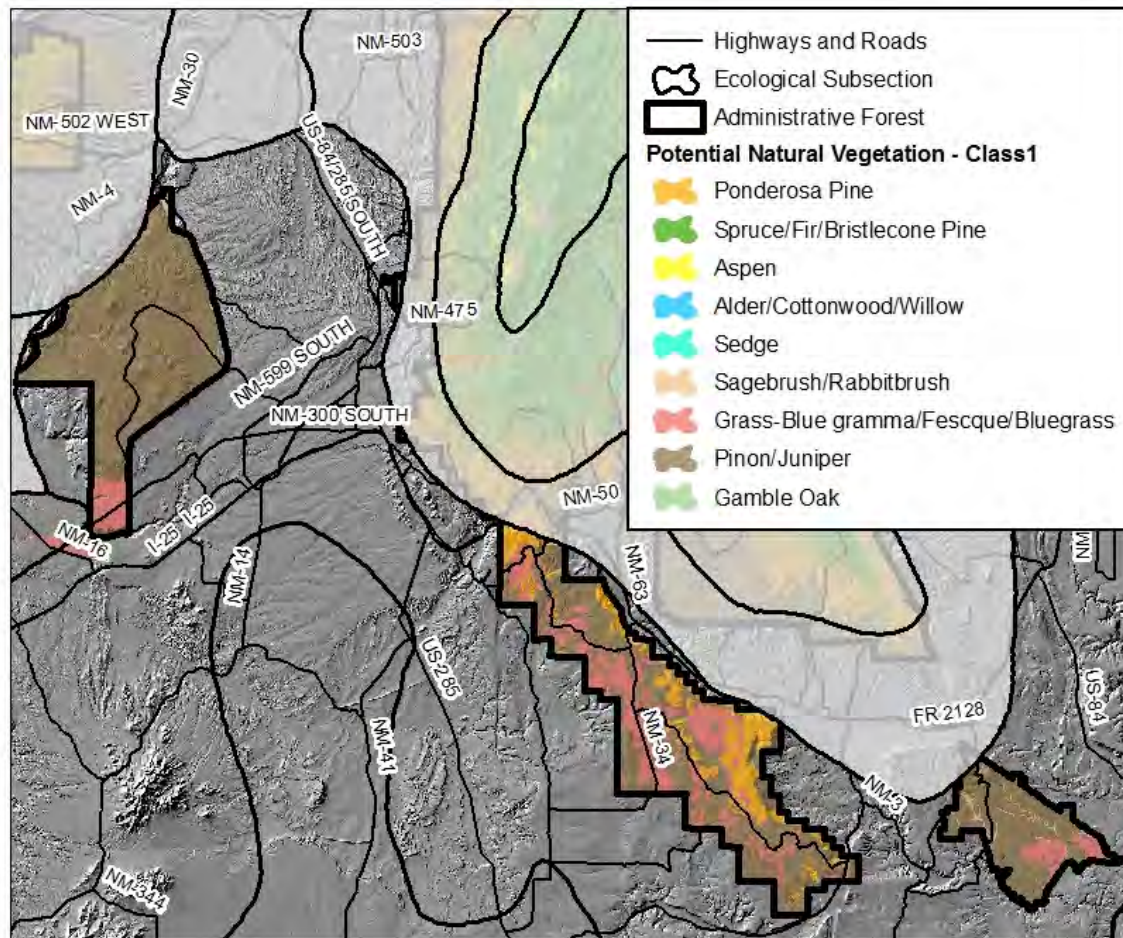


Figure 24. Terrestrial Ecosystem Survey Vegetation Types for the Manzano Mountains Woodland Subsection.

Disturbance Regimes

Across the ecological section natural fire regime averages 3 to 10 years of frequency in ponderosa pine forests (McNab and Avers 1994b). Wildfires vary in frequency and intensity within the vegetation type represented in this ecological subsection. Fires also vary in frequency and intensity, depending on fuel load and moisture. In most cases, historic occurrence has changed from frequent, low intensity, ground fires to infrequent, high intensity, stand replacing fires. However, no large fires have occurred in this subsection. The historic fire regime over much of the area in ponderosa pine and sagebrush dominated areas is less than 35 year fire return interval with low and mix severity with some pinyon-juniper dominated areas having 35 to 200 year fire return interval with low and mixed severity. Grassland dominated areas have less than 35 year fire return interval with replacement severity (LANDFIRE 2014a). The vegetation within this subsection is mostly high departure from these fire regime groups, depending on the vegetation communities present. Some moderate departure occurs in the Glorieta Mesa unit and some low departure in the Anton Chico unit (LANDFIRE 2014b). Other natural disturbances include insect and disease risk in pinyon-juniper mix vegetation types with mortality and damage from pinyon ips.

The Forest continues to feel the effects of drought conditions. Below average precipitation causes increased stress on trees which can make them more susceptible to insect and disease and

increase severity and intensity of wildfires. Drought conditions also affect availability of water resources, which are highly sought by recreationists as well as wildlife.

Human Caused Disturbance

Management activities include livestock grazing, vegetation management to improve range condition, wildlife habitat improvement, other vegetation management, prescribed fire activity, communication sites, utilities, travel management, dispersed recreation use including but not limited to camping, hunting, hiking, and motorized use.

Livestock grazing occurs throughout with noticeable changes to the landscape when looking at grazed and ungrazed grasses, range fences, livestock trails, and water developments. Vegetation management to improve range condition may include prescribed fire, herbicide treatment. These management activities may be noticeable when viewed in the foreground distance zone, but typically do not dominate the landscape. These types of activities occur in an overall naturally appearing landscape with minor deviations when structures or developments are viewed. Occasionally some of these activities change the naturally appearing form, line, color or texture of the landscape. An area of mechanical vegetation manipulation for range improvement dominates the landscape on the Glorieta Mesa unit. Areas of intensive grazing with noticeably bare ground begins to dominate the view from roads in the Anton Chico area on the Pecos/Las Vegas Ranger District.



Figure 25. Grazing allotment in area south of Starvation Peak.

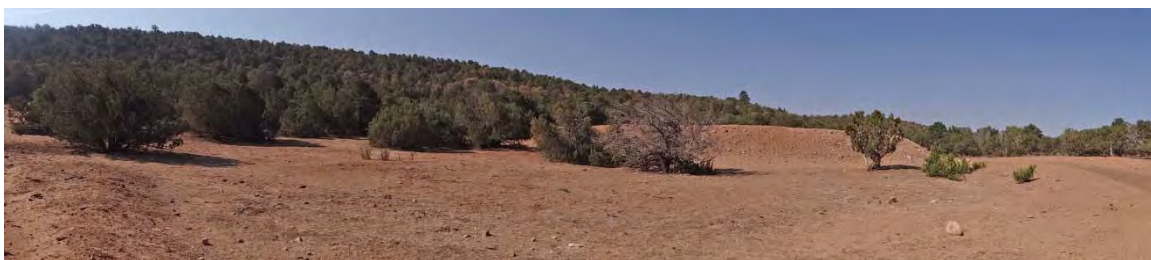


Figure 26. Grazing allotment and stock dam in area south of Starvation Peak.

Wildlife habitat management occurs in the Caja del Rio Plateau unit may include opening rehabilitation, precommercial thinning, water developments, and structural improvements.

Various vegetation management activities are scattered throughout the subsection with precommercial thinning and fuels reduction activities. Pre-commercial and fuels reduction vegetation treatments are often not noticeable once slash disposal has occurred or lop and scatter slash begins to blend with the surrounding vegetation.

The effects of prescribed fire on the landscape are naturally appearing since fire edges typically follow natural vegetative patterns and terrain features. The effects of prescribed fire typically go

unnoticed by forest visitors after a few years, depending on project objectives and amount of moisture received.

Communication sites, utilities, and mining activities are the most noticeable alterations in this landscape when they are viewed. Communication sites with multiple towers may dominate a view due to the strong linear features added to the landscape above a shrub or tree canopy and landform features and vegetative clearing for facilities.

Major power or utility lines are located throughout the subsection. Major utility corridors often dominate the landscape when viewed either with large vertical structures or vegetative clearing making the landscape appear heavily altered. Where vegetative clearing is not needed or minimized, these activities result a landscape which generally appears moderately altered.

Mining and gravel or borrow pits occur in the Caja del Rio Plateau unit in this subsection. Mining, gravel pits, and borrow pits tend to heavily alter the landform component of the landscape and expose noticeably different colored rock and soils. The form and color of the landscape often appears heavily altered by these activities.

Within this subsection, most roads present are suitable for high clearance vehicles only. Roads more easily traveled, suitable for passenger cars, provide access throughout the subsection and include: US and State Highways such as NM Highway 34 and County Roads. These roads, secondary roads, motorized trails, and non-motorized trails are the primary access and platform for viewing scenery and may occur in otherwise naturally appearing landscapes.

Dispersed recreation, primarily in the forms of dispersed camping, hunting, hiking, and motorized use occur across the area. The landscape appears unaltered from these activities.

Sangre de Cristo Mountains Ecological Subsections (M331Fa, M331Fg, M331Fh)

The description of these subsections (M331Fg – Sangre de Cristo Mountains Woodland, M331Fh – Sangre de Cristo Mountains Coniferous Forest and M331Fa – Sangre de Cristo) will be combined because they are all part of the Southern Parks and Rock Mountain Ranges Ecological Section. This description will focus on the portion within the Santa Fe National Forest:

Social Component

Valued Landscape Attributes

These ecological subsections cover the Sangre de Cristo Mountains west of Santa Fe on the Española and Pecos/Las Vegas Ranger Districts. The area is characterized by endless mountains with highly dissected slopes, sharp, angular ridgetops, and deep V-shaped canyons. Features of glaciation, such as cirques, glacial troughs, deep valleys, and sharp combs, are distinctive landforms. The massive mountains have summits ranging from 11,000 feet to over 13,000 feet. Truchas, Pecos Baldy, and Santa Fe Baldy are all prominent peaks rising above timberline. Vegetative patterns vary with elevation, aspect, moisture, and topography. Throughout the subsections, lower elevations are dominated by pinyon pine and juniper, which transitions to ponderosa pine forest as elevation increases. The ponderosa pine forest changes to upper deciduous-evergreen forest with more aspen, spruce, and fir mixing with pine types. Aspen dominates many areas in the Sangre de Cristo Mountains. Aspen dominates areas burned by large historic fires throughout the subsections. The highest elevations in the Pecos Wilderness are dominated by spruce-fir forests, wet meadows intermixed with spruce-fir forests, and subalpine tundra. In the fall riparian vegetation and aspens add breathtaking colors to the landscape. Landforms and vegetation combine for dramatic landscapes comprised of pine and spruce forests, aspen turning golden colors in the fall, and high mountain meadows occurring on steep mountains and in river canyons with high cliffs and rock outcrops. The rugged landscape, high elevation deciduous and evergreen forests and streams provide for distinctive scenic attractiveness throughout much of the subsections. A number of distinctive water features occur including Pecos River, Santa Fe River, Bull Creek, Cow Creek, Rio Mora, Rio Nambe, Pecos Falls, McClure Reservoir, Nichols Reservoir, Katherine Lake, Pecos Baldy Lake, and Santa Fe Lake, to name a few. Visitors are drawn to the beauty of rugged canyons, dramatic landscapes, cool waters, panoramic vistas, recreation opportunities, open spaces, and primitive experiences.

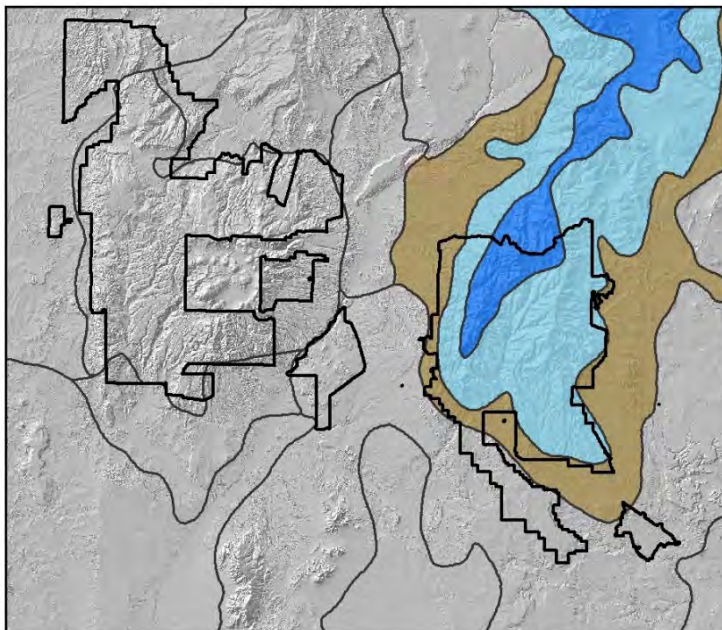


Figure 27. Sangre de Cristo Mountains Ecological Subsections Map (M331Fa, M331Fg, M331Fh)

The landscape has a special place in history with prehistoric ruins and historic sites. Santa Fe National Forest Scenic Byway, Windsor National Recreation Trail (T254), and Pecos National Wild and Scenic River are other popular sights of interest. Most streams are perennial; some are intermittent.

Special or Distinctive Features

Dramatic high elevation mountain landscapes with pine, spruce, and fir forests interspersed with blazing golden aspen in the fall and mountain meadows filled with wildflowers provide for distinctive scenic attractiveness throughout much of the subsections. High mountain lakes and river canyons with high cliffs and rock outcrops add uniqueness and variety to the landscape.



Figure 28. Baldy Lake with Truchas Peak in the background (USDA FS 2014f)

Other Special or distinctive features include:

- ◆ Pecos Wilderness Area offers solitude, very high scenic integrity and wilderness experiences.
- ◆ Santa Fe River watershed has a unique history as it once featured homesteads, sheepherding, logging, and old dams. Now the area is managed for resource protection as a municipal watershed for Santa Fe.
- ◆ Pecos Canyon is a scenic recreation corridor in these subsections. The rugged canyon, rock outcrops, high mountain meadows, and cascading water are uniquely scenic and draw many visitors. The canyon is a popular trout fishing stream. Cathedral Rock, a picturesque roadside pink granite cliff, is a popular climbing area.
- ◆ Falling color viewing of vivid gold aspen is popular. Aspens at Big Tesuque are a draw for visitors.

Water Resources and Wild and Scenic Rivers

Water is a valued resource within these subsections. Perennial streams are found throughout including but limited to: Pecos River, Santa Fe River, Bull Creek, Cow Creek, Rio Mora, Rio Medio, Rio Frijoles, Rio Nambe Rio En Medio, Tesuque Creek, Rio la Casa, Porvenir Canyon, and Gallinas Creek. Intermittent streams also occur throughout the subsections. McClure Reservoir, Nichols Reservoir, Katherine Lake, Pecos Baldy Lake, Santa Fe Lake, and Cowles Pond are just a few of the lakes and reservoirs.

Pecos River is a nationally designated wild and scenic river with wild and scenic designations. Scenery is an Outstandingly Remarkable Value. Scenic values are the rugged granite canyons, waterfalls, interspersed with small high mountain meadows (USDA FS 1987). Scenic attractions include dramatic landscapes of pine and spruce forests interspersed with aspen patches, high cliffs and rock outcrops, mountain meadows of multi-colored wildflowers, and clear water cascading through the narrow valley have attracted people to the area for many years. In autumn, the aspen turns a vivid golden yellow. Panoramic views are revealed near the headwaters of the Pecos River. In the wild segment, the river begins as a high mountain stream, later becoming an array of shallow rapids, churning eddies, and multiple cascades. Pecos Falls is an attractive waterfall and destination for many visitors. In the lower segment, the meandering water through the canyon provides a unique feature in contrast with the arid plains to the east and south. The few structures in the Beatty's flat area and cabins within the corridor are rustic and blend well with the landscape (USDA FS 2003).

The 1987 Forest Plan lists Gallinas Creek as an eligible wild and scenic river, but it was not recommended for inclusion in the National Wild and Scenic River (NWSR) System in the 1987 Forest Plan. Gallinas Creek flows southeast through a narrow V-shaped canyon cloaked in coniferous tree cover of Engelmann spruce, Douglas-fir, and white fir. Outstandingly remarkable values are cultural and landscape character of the community of Gallinas (USDA FS 1987).

Table 3: Jemez and San Pedro Mountains Subsection Designated and Eligible Wild and Scenic Rivers (USDA FS 1987, 2010a)

River	Designation or Status	Outstandingly Remarkable Value
Pecos River	Designated Wild (4.0 miles) Designated Scenic (5.0 miles)	Scenic, Recreational, Cultural/Historic
Gallinas Creek	Eligible, but not recommended for inclusion in the NWSR System in 1987 Forest Plan	Cultural

For eligible streams, the Outstandingly Remarkable Value listed were identified for at least one segment in the Environmental Impact Statement for the 1987 Forest Plan (USDA FS 1987)

Recreation Opportunities

Most of the recreation opportunities section is summarized from the draft forest plan assessment sections written by forest specialists in 2015. Recreation opportunities are developed and dispersed, both motorized and non-motorized, with numerous day use sites, campgrounds, trailheads, trails, and scenic drives. Developed recreation sites are concentrated along the NM Highway 63 in the Pecos River drainage and NM Highway 475 to the Santa Fe Ski Basin, and NM Highway 65 accessing the eastern portion of the area. Popular recreation activities include dispersed camping, camping in developed campgrounds, picnicking, trout fishing, hunting, hiking, horseback riding, and driving for pleasure on system roads and trails designated for motorized use. Back country camping and backpacking are available in Pecos Wilderness.

Driving for pleasure and viewing scenery is popular along NM Highways 475, 63, 65, 283, and 276, designated scenic byways discussed below, and many other Forest roads including but not limited to: NFSR 102, NFSR 263, NFSR 83, NFSR 113, and NFSR 375. Winter use, downhill skiing, cross-country skiing, snowshoeing, and snow play, occurs.

The Española Ranger District in these subsections has a more urban character due to its proximity to Santa Fe, a community with an approximate population of 100,000. The proximity of forest resources to nearby residences is a valued characteristic, offering a range of opportunities which have become part of the residents' lifestyle. Main recreation areas on the Espanola Ranger District area: Borrego Mesa, Aspen Basin, Santa Fe Area, North Española Area.

Pecos/Las Vegas Ranger District in these subsections has a number of developed sites and miles of recreational trails. Pecos Canyon is a scenic recreation corridor in these subsections that contains several of the districts' developed recreation sites. There are also private recreation sites and New Mexico State Department of Game and Fish sites. The canyon has one of the state's most popular trout fishing streams (Pecos River) and several popular rock climbing areas. The eastern portion of the District is located near the Town of Las Vegas. Several other small rural communities also surround this eastern perimeter of the district. Recreation opportunities (picnicking, camping, and viewing for wildlife) exist all along this side of the district and are often used by local college or university students, local residents, or visitors who are drawn to the area by the historic districts in Las Vegas and other smaller communities in the area.

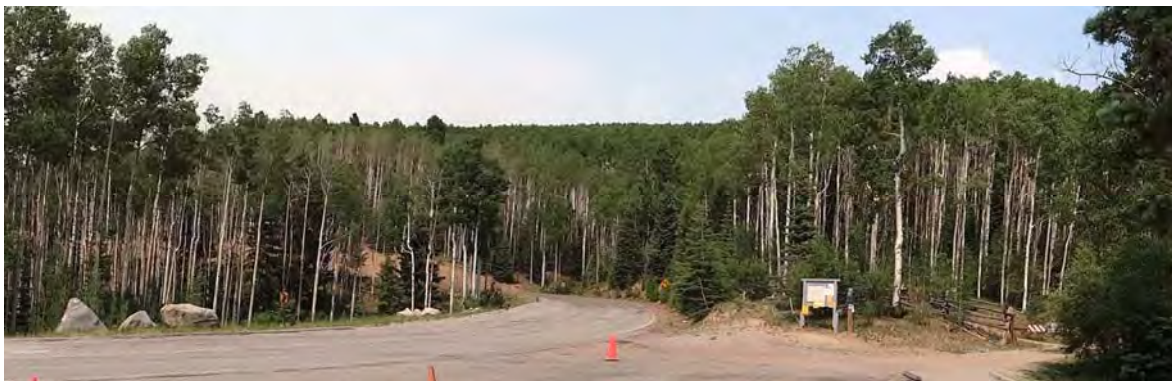


Figure 29. View of vegetation from Aspen Vista on Santa Fe National Forest Scenic Byway

Santa Fe Ski Area

Santa Fe Ski Area is a year-round mountain retreat for local residents of Santa Fe and tourists from all over the world. The ski area offers many different levels of skiing for skiers of all abilities and has an award-winning adaptive ski program for persons with disabilities. In the summer, the ski slopes offer hiking and mountain biking dispersed recreation opportunities. During the fall, the ski area opens a lift for viewing of fall colors. The parking lot of the ski area serves as parking for the Winsor National Recreation Trail trailhead and a gateway to the west side of the Pecos Wilderness.

Santa Fe National Forest Scenic Byway

This nationally-recognized strip of highway starts in the historic downtown plaza in Santa Fe and ends, 16 miles later, at the Santa Fe Ski Area. The drive is most scenic in autumn when the aspen colors are in full effect. Vista Grande Overlook, near the top of the byway, has spectacular views of the Rio Grande Valley between the Jemez Mountains to the West and the Sangre de Cristo Mountains. The cities of Santa Fe, Los Alamos, White Rock, and on clear days, even

Albuquerque are visible from this vista. Big Tesuque and Aspen Vista both have great views of the fall foliage. In addition to great views, a number of campgrounds and picnic areas are located along the way.



Figure 30. View of fall colors from Santa Fe National Forest Scenic Byway (USDA FS 2014d)

Other Scenic Byways

Driving for pleasure and viewing scenery and cultural landscapes is popular along three other national scenic byways which pass through this subsection off Forest.

- The High Road to Taos Scenic Byway takes the traveler through an authentic remnant of Old Spain, still evident in the religion, architecture, topography, history, and people along the route. This byway begins by taking US 285/84 north from Santa Fe and turning east on NM 503 to the Pueblo of Nambe. Occupied since about 1300, this Tewa pueblo was first described by Castaño de Sosa in 1591 as a square structure, two stories high with a central plaza (New Mexico Tourism Department 2015b).
- Route 66 pre-1937 alignment National Scenic Byway allows travelers to experience a unique cultural landscape full of the charm and history of the 1950s and 1960s. People from across the country and all over the world experience the American spirit and open road of Historic Route 66 (USDOT FHA 2015b). The historic route runs parallel to Interstate 25 (I-25) and travels through the Pecos/Las Vegas RD, traveling close to the Pecos River at various points.
- The Santa Fe Trail National Scenic Byway, one of the first trade routes, travels east of Santa Fe following New Mexico State Highways and US Highways. Travelers can visit historic sites and landmarks and enjoy spectacular scenery, from rugged mountains to plains (USDOT FHA 2015c). The route is also designated as a National Historic Trail

Pecos Wild and Scenic River

The Pecos Wild and Scenic River has long been a recreational destination for visitors from the region, as well as from around the country. While the Pecos Wilderness adds value to the wild and scenic river, most visitors come simply to enjoy the water. The river is regarded as one of the state's most popular trout fishing streams (USDA-FS 1987). Local users center their recreation activities on multi-generational family gatherings near the river. In the summer, the river provides relief for visitors coming from the hot, dry environment typical of the southwestern United States. Use is particularly high during this period, with visitors staying often for days or weeks. Popular

activities along the entire WSR corridor include hiking, camping, backpacking, horseback riding, hunting, fishing, water play, photography and sightseeing. Opportunities abound for remote, primitive activities in the wild segment, while the recreational segment offers a range of day and overnight activities from Terrero to Cowles for visitors seeking more developed, less isolated settings that are accessible by automobile (USDA FS 2003).



Figure 31. Pecos River Canyon

Winsor National Recreation Trail

Winsor National Recreation Trail, which is 22 miles long, begins at the end of County Road 72A in Tesuque and ends at Winsor Creek Campground. Within the Española District, the trail is divided into two sections. The lower elevation trail from the Tesuque Trail Head to Aspen Basin is outside of the Pecos Wilderness. The next section from Aspen Basin to Spirit Lake is within the Pecos Wilderness. The trail is open for hiking, backpacking, mountain biking, (only the lower trail outside of the Wilderness) and horseback riding.

Pecos Wilderness

Deep and narrow canyons, long and broad mesa tops, heavily forested slopes, and rugged ridges with peaks above timberline characterize the Sangre de Cristo Mountains of the Pecos Wilderness. On the western side, steep canyons drain toward the Rio Grande. In contrast, to the east lies the relatively gentle upper Pecos River Valley, an area of broad flat mesas and grassy meadows. At least 15 of the lakes offer first-rate fishing, as do 150-plus miles of sparkling streams, where rainbow trout, brown trout, and Rio Grande cutthroat trout can all be found. These waters head the Pecos Wild and Scenic River. The high country elevations range from 8,400 feet to 13,103 feet atop South Truchas Peak, the state's second highest point. The scenery varies from 100-foot-drop waterfalls and crumbled talus slopes to dramatic rock cliffs, towering peaks, and wildflower meadows best caught in July and August. Engelmann spruce, corkbark fir, ponderosa pine, Douglas fir, white fir, limber pine, bristlecone pine, and aspen are the dominant tree species (Pecos Wilderness 2014).

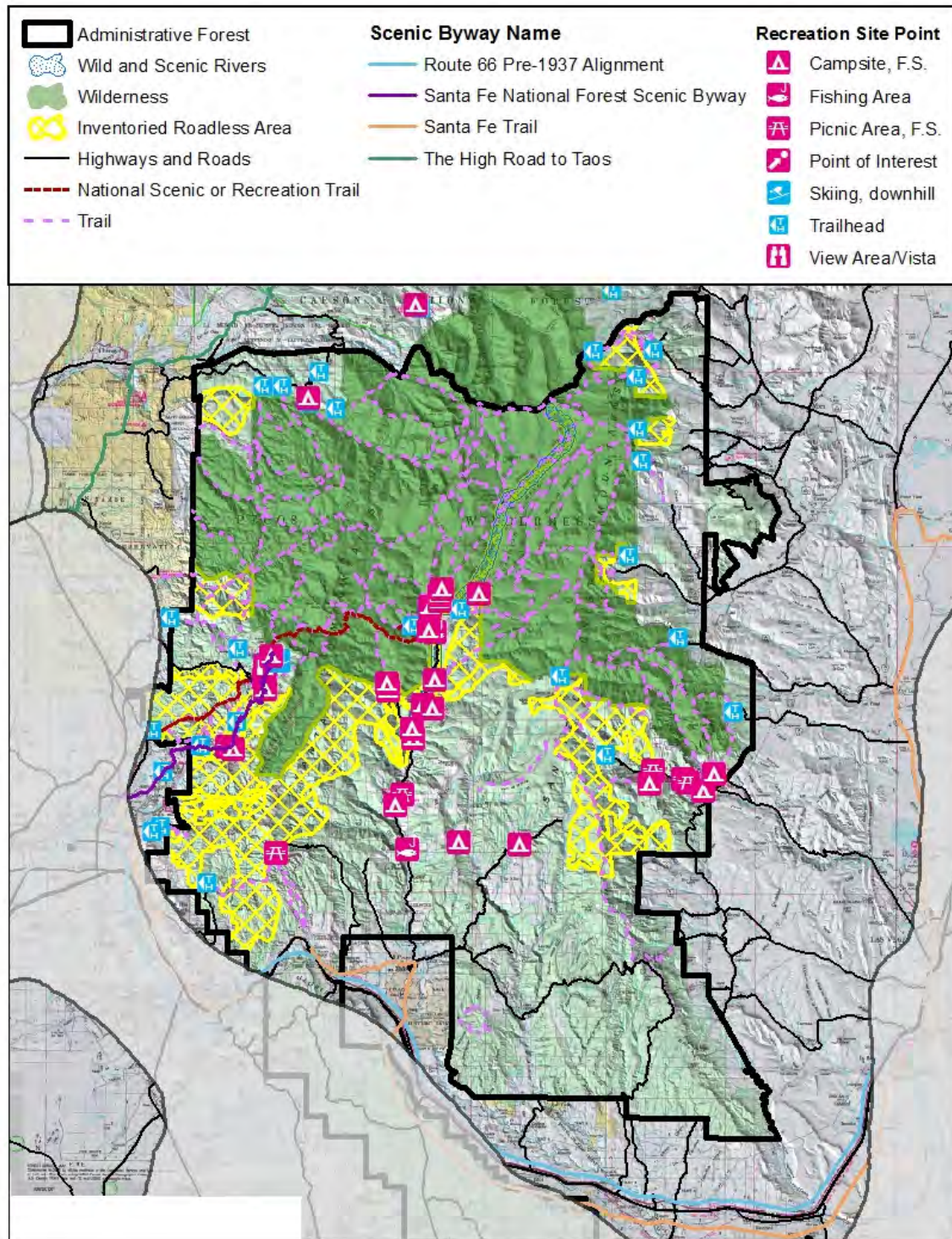


Figure 32. Recreation Opportunities Map for the Sangre de Cristo Subsection

Cultural Ecology

The ecological section description covers an area larger than this scenic character description and includes a section on cultural ecology. McNab and Avers (1994c) describe the cultural ecology as follows:

The Southern Parks and Rocky Mountain Ranges Section is comprised largely of high elevation and very high elevation meadows and mountain ranges, principally the Sangre de Cristo Mountains. High elevation parks and ranges present physical limitations with regard to weather patterns, reduced oxygen levels, lack of abundance and variety in plant and animal communities, and a short growing season. There is little evidence of permanent occupation during prehistoric times, but high elevation areas have been utilized on a relatively limited basis from the earliest dates of human occupation in the Southwest, i.e., since about 12,000 years ago. Although such areas are somewhat inhospitable, prehistoric peoples did make considerable use of various resources found in high elevation areas. These included lithic materials, large and small game, plant materials, spiritual power locations, and various minerals. With heavy reliance on agriculture beginning around 1000 A.D., early farmers began using the lower limits of high elevation areas to grow crops. High elevation areas have the most abundant and most reliable rainfall in the Southwest, which functioned to attract agricultural peoples; but limitations were presented by an increasingly shorter growing season with increase in elevation.

In the earlier portion of the historic period in the 1600's and 1700's high elevation activities included continued hunting and foraging by Native Americans, but with the addition of Anglo fur trapping and Hispanic summer sheep pasturage. As Anglo and Hispanic utilization increased, such activities as hard rock mining, cattle grazing, and timber harvest and freighting grew in importance. These activities were highly dependent on Eastern transportation and market systems. By the late 1800's, more and more farms, ranches, and homesteads made their appearance in the Sangre de Cristo Mountains. Through construction of irrigation systems, supplied with water from the relatively abundant precipitation at high elevations, farmers and homesteaders were able to survive by growing crops to help feed cattle and sheep herds during the harsh winter months. Farms, ranches, and homesteads were generally single-family operations, but a number of small towns, mostly populated by Hispanic peoples, began to spring up. Much of the area within this Section is now national forest land, with a significant portion designated as wilderness. Economic uses of the mountains include recreation, logging, and ranching. Both Hispanic and Native American communities continue many traditional uses of the mountains, and many of the peaks have special religious significance for nearby pueblos.

Ecological Component

Included in the Southern Parks and Rocky Mountain Range Ecological Section (M331F), these subsections are located in north-central New Mexico. The Sangre de Cristo Mountains Coniferous Forest (M331Fh), Sangre de Cristo Mountains Woodland (M331Fg), and Sangre de Cristo (M331Fa) Ecological Subsections within the Santa Fe National Forest include over 50 Terrestrial Ecological Unit (TEU) map units and 21 GTES map units. The ecological component below is summarized from Ecological Subregions of the United States (McNab and Avers 1994c), Ecological Subregions: Sections of the Conterminous United States (McNab et al. 2005), Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991).

Dominant Environmental Regimes

Landform/ Geomorphology

Sangre de Cristo Ecological Subsections are in north-central New Mexico. At the ecological section level, landforms include high mountains with valley plains. Geologic formations are variable and include rocks of igneous, metamorphic, and sedimentary origin (McNab et al. 2005). The Sangre de Cristo Mountains are this ecological section's major landform feature.

The Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989) describes this area in detail. The area is characterized by mountains that have highly dissected slopes, sharp, angular ridgetops, and deep V-shaped canyons. The Sangre de Cristo range is a steep anticlinal uplift, granite cored and flanked by sedimentary which, at places, overarch the crest. Features due to glaciation (cirques, glacial troughs, deep valleys, and sharp combs) are occasionally evident in New Mexico. The mountains in this area are massive mountains for New Mexico with summits ranging from 11,000 feet to over 13,000 feet. On the Santa Fe National Forest, Truchas, Pecos Baldy, and Santa Fe Baldy all rise above timberline (USDA FS 1989).



Figure 33. Landforms and vegetation viewed from Jacks Creek Campground and Trailhead,.

General Ecosystem Survey characterizes the landforms on the Forest as valley plains, elevated plains, hills, hills and mountains, mountains, and escarpments. Major landforms within the Forest include Sangre de Cristo Mountains and Santa Fe Mountains with numerous peaks, mesas, and canyons. Pecos Canyon, Truchas Peak, Pecos Baldy, Lake Peak, Santa Fe Baldy, and Hermit Peak, are prominent landscape features to name a few. Truchas Peak in the Pecos Wilderness towers at 13,103 feet. Detailed soils information can be found in McNab and Avers (1994c). Elevation ranges from 7,500 to 14,000 feet (2,300 to 4,300 meters) (McNab and Avers 1994c).

Table 4: Landforms by General Ecosystem Survey map units for the Sangre de Cristo Mountains Subsections

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
130	elevated plains
131	hills/mountains
132	hills/mountains, mountains, escarpments
160	elevated plains
161	hills/mountains
176	elevated plains, hills/mountains
177	mountains, escarpments
181	elevated plains, mountains
351	hills/mountains
352	hills/mountains, mountains, escarpments
451	hills/mountains
452	mountains, escarpments
466	elevated plains, hills/mountains
471	valley plains
473	mountains
515	valley plains
516	valley plains
517	valley plains
554	elevated plains, hills
558	valley plains
559	valley plains

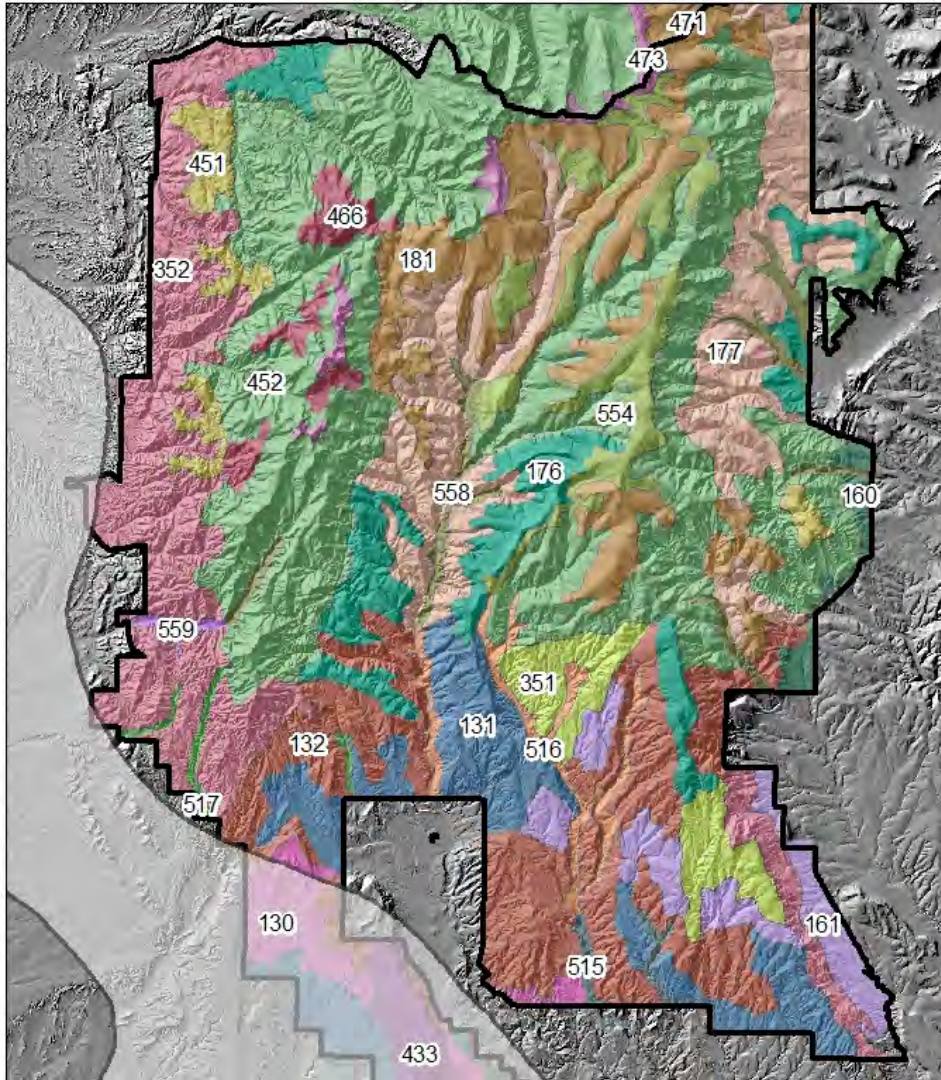


Figure 34. General Ecosystem Survey map units for the Sangre de Cristo Subsections

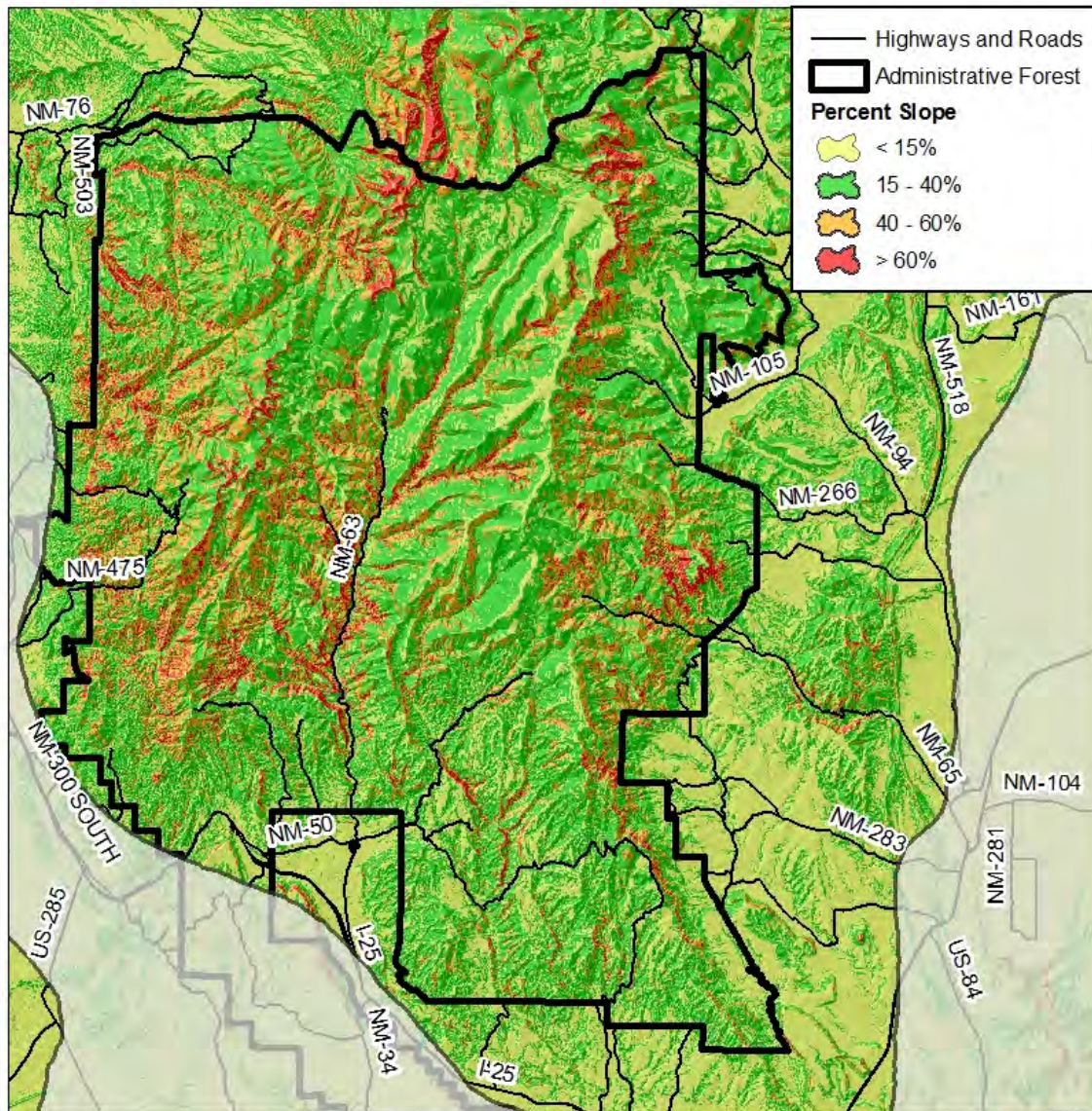


Figure 35. Topography map using percent slope for the Sangre de Cristo Subsections

Climate

Precipitation ranges from 24 to 28 inches (600 to 700 millimeters) annually, with less than half of the precipitation falling during the winter. Temperature averages 32 to 45 °F (0 to 7 °C) and winters are cold. The growing season lasts 70 to 110 days (McNab and Avers 1994c).

Surface Water Characteristics

Across the ecological section, water from streams and lakes is abundant, and ground water is plentiful (McNab and Avers 1994c). The area is drained primarily by small perennial watercourses, which are common throughout. The principle water courses are the Pecos River, which bisects the subsections, and Santa Fe River. Fresh meadows, marshes and bogs are common to parts of the area (USDA FS 1989). Pecos River is a nationally designated wild and scenic river. Intermittent streams are also found throughout. Several natural and man-made lakes or reservoirs are located within the Forest in these subsections that are used primarily for

recreation. Most of the natural lakes are found in glacial cirques in the higher mountains (USDA FS 1989).

Existing Vegetation

The vegetation within NFS lands varies across the subsections depending on elevation, aspect, and soils influencing vegetative patterns. At a broad scale, “coniferous forest is the predominant vegetation. Montane conifer generally dominates the lower mountain slopes while subalpine conifer dominates the upper mountain slopes. Pinyon-juniper woodland and plains grassland can be found in the foothills at the base of the mountains. Aspen and mountain meadow grassland are common to parts of the area. Alpine tundra can be found on the summits of several of the higher mountain peaks. Stingers of riparian deciduous forest and woodland are common along watercourses” (USDA FS 1989, 43).

The vegetation types at the midscale level are discussed by dominance type. Within the subsections, lower elevations in the south and western foothills of the Forest are dominated by pinyon and pinyon-juniper which transitions to ponderosa pine mix as elevation increases. The ponderosa pine mix changes to upper deciduous-evergreen forest mix with more aspen, spruce, and fir mixing with pine types. Aspen dominates many areas in the Sangre de Cristo Mountains. Young aspen dominates areas burned by large recent and historic fires throughout the subsections. The highest elevations in the Pecos Wilderness are dominated by spruce-fir forests, wet meadows intermixed with spruce-fir forests, and subalpine tundra. Riparian vegetation is common in most drainage bottoms. A combination of high elevation and abundant moisture result in a beautiful array of color from flowering plants during the summer months. A figure on the next page depicts the most prominent existing vegetation using midscale vegetation mapping dominance types.



Figure 36. View of vegetation from Aspen Vista on Santa Fe National Forest Scenic Byway



Figure 37. Landform and vegetation from Vista Grande Overlook along Santa Fe National Forest Scenic Byway.



Figure 38. Ponderosa pine stands along NFSR 18

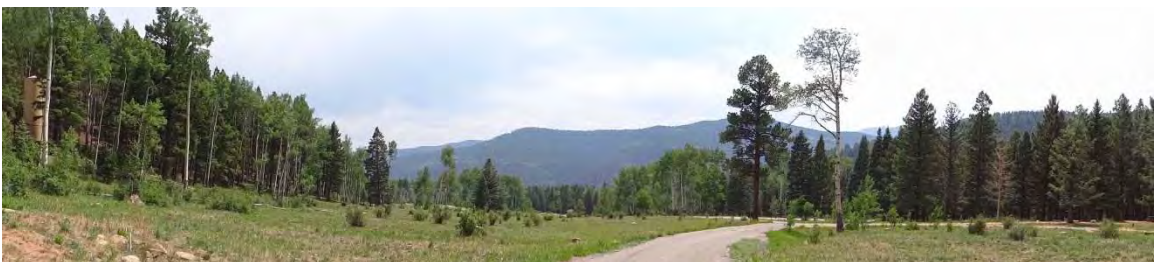


Figure 39. Meadow at Jack's Creek Campground and Trailhead

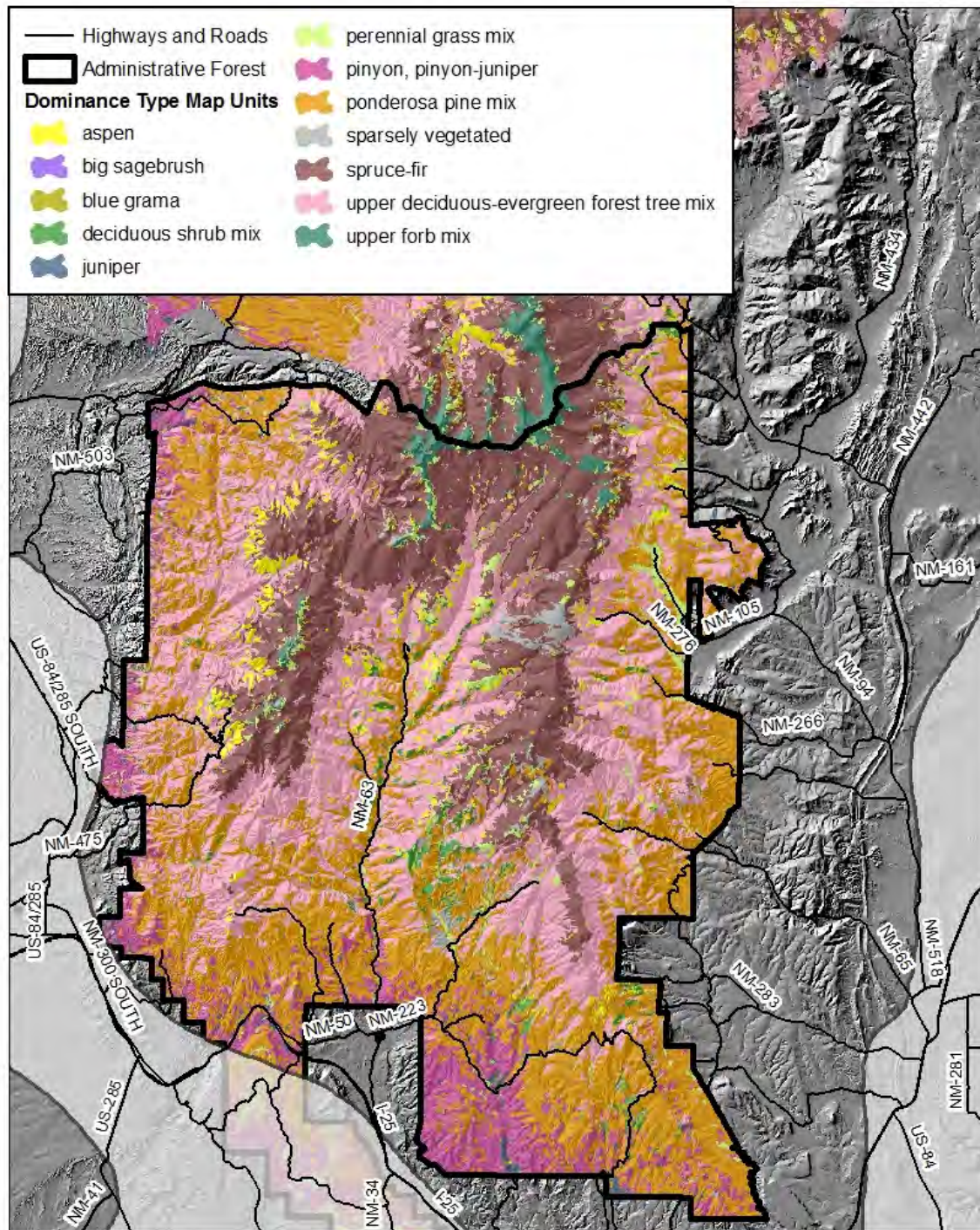


Figure 40. Midscale Vegetation Dominance Types for the Sangre de Cristo Subsections

Potential Natural Vegetation

At a broad scale, predominant vegetation includes Douglas-fir and ponderosa pine in frigid soil temperature regimes; Engelmann spruce and subalpine fir in cryic soil temperature regimes; and kobresia, geum and arenaria in alpine pergelic zones (McNab and Avers 1994c).

Potential Natural Vegetation types are depicted with Terrestrial Ecosystem Survey vegetation types, as shown in the following figure. Several vegetation communities occur on NFS lands within this subsection. Alder, cottonwood, and willow riparian vegetation occurs along perennial stream courses including but not limited to Pecos River, Santa Fe River, and most perennial streams. Pinyon-juniper dominates lower elevations that transitions to ponderosa pine mix as elevation increases with spruce, fir, pine mix at the highest elevations. Aspen occurs within the conifer forests. Sedge and grass mixes dominate large meadows. Blue grama, fescue, bluegrass mix dominate large meadows and high elevations in the mountains in the central portions of the subsections.

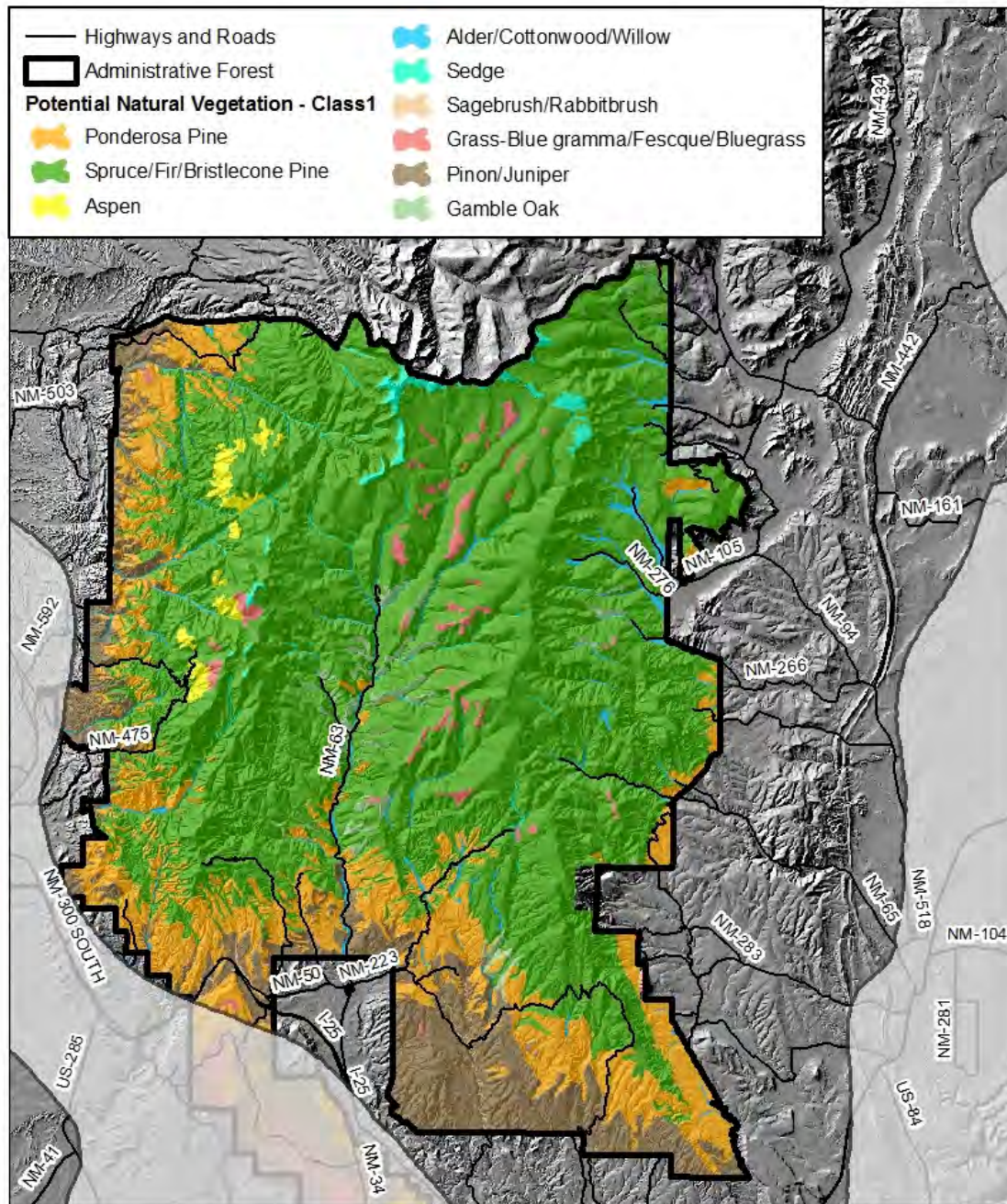


Figure 41. Terrestrial Ecosystem Survey Vegetation Types for the Sangre de Cristo Subsections

Disturbance Regimes

Across the ecological section, fires vary in frequency and intensity in ponderosa pine stands, but may occur when fuel load is high and dry. Fire is rare in areas with cryic temperature regimes and udic soil moisture regimes. The upper mountain slopes are forested, but merchantable timber is scarce. Recreation, mining, and ranching are important land uses (USDA FS 1994c).

Wildfires vary in frequency and intensity within the vegetation type represented in these ecological subsections. Fires also vary in frequency and intensity, depending on fuel load and moisture. In most cases, historic occurrence has changed from frequent, low intensity, ground fires to infrequent, high intensity, stand replacing fires. Uncharacteristic, stand-replacing wildfires pose fire flooding and erosion risk, and insects and disease outbreaks on the Forest. The historic fire regime over much of the area in highest elevations of the upper deciduous and spruce-fir-pine mix is 35 to 200 year fire return interval with replacement severity. The historic fire regime of the lower elevations of the upper deciduous and spruce-fir-pine mix dominated areas have a fire regime group 35 to 200 year fire return interval with low and mixed severity. Ponderosa pine dominated areas have a fire regime group of less than 35 year fire return interval with low and mix severity. The historic fire regime over much of the area in pinyon-juniper dominated areas is 35 to 200 year fire return interval with low and mixed severity (LANDFIRE 2014a). The vegetation within these subsections has mostly high and moderate departure from these fire regime groups depending on the vegetation communities present. Areas of high departure from these fire regime groups occur in the lower elevations of the subsections, while moderate departure occurs in higher elevations. Low departure from these fire regime groups occur in the Viveash Fire area (LANDFIRE 2014b).

Most noticeable changes to scenic conditions across the landscape occur through natural processes such as wildfires, wind events, or flooding. These natural disturbances will continue to shape the vegetation and landform features of the landscape, affecting the overall sustainability of the scenic character. Fire can also benefit scenic character. Historic fires on the Sangre de Cristo Mountains have resulted in large areas of aspen, which provide beautiful golden fall colors intermixed against green conifer covered mountains.

Wildfires which burn with mixed severity have fewer impacts to scenic character than those that burn with high severity, which result in greater tree mortality. Low and mixed severity fires are part of the characteristic landscape. The Tres Lagunas Fire of 2013 burned about 10,000 acres on the Pecos/Las Vegas Ranger District in the Pecos River recreation corridor. When viewed from the NM Highway 63, the fire appears to have burned in a mosaic pattern with mixed severity, a mixture of blackened tree boles, green trees, red needled trees and pockets of crown replacement and blackened trees can be seen (Observation from site visit by author, June 2013).



Figure 42. Views of the Tres Lagunas Fire on hillside showing a variety of effects to vegetation.. Photo taken in June 2013.

Some of the other fires, partially or wholly located within the subsection, which have shaped the landscape setting in this ecological subsection include: 2013 Jaroso Fire, 2011 Pacheco Fire, 2003 Capulin Fire, 2002 Borrego Fire, 2002 Trampas Fire, 1993 Frijoles Fire, 1993 Quemado Fire, and 1971 Cat and Dog Fire. The Jaroso Fire of 2013 burned within the Pecos Wilderness Area with most of the fire area having over 75 percent basal area loss (USDA FS 2014e). The Borrego Mesa Fire of 2002 in the Sangre de Cristo Mountains on Española Ranger District caused widespread tree and vegetation mortality. This high severity fire changed the scenic character in this area and increased occurrences of invasive plant species. The fire also created hazard trees on along Forest Road 306, and Trails 157 and 227 were damaged by the fire and subsequent flooding, which affects opportunities for viewing scenery. The Viveash Fire of 2000 burned on the Pecos/Las Vegas Ranger District resulting in tree mortality with ongoing hazard tree and erosion issues present. It also burned down Cow Creek Campground which has not been rebuilt.

The Blowdown in the Pecos Wilderness, likely caused by a microburst, made nearly every tree in a 1,300-acre area fall over or break off. This blowdown affected several trails in the Pecos Wilderness, including the Panchuela West Corridor, a major throughway involving trails 253,

158, and 156 by burying the trails in multiple layers of downed trees, making them impassible to hikers, and livestock. This event likely occurred in 2005. In 2013, the Jaroso Fire burned through portions of this blowdown.



Figure 43. The 13,000-acre blowdown in the Pecos Wilderness, prior to Jaroso Fire including an aerial view (above) and close-up (below)

Other natural disturbances include insect and disease risk in upper deciduous and evergreen mix vegetation types with mortality or damage from western spruce budworm, spruce beetle, western balsam bark beetle, fir engraver, Douglas fir beetle, and western tent caterpillar causing aspen defoliation to name a few. Aspen defoliation can greatly affect scenery since fall colors are a big part of the economy and tourism industries. The primary tree species people travel to look at in New Mexico are aspens, and defoliation can have many different economic and ecologic impacts

(NM State Forestry 2012). Ponderosa pine dominated types have insect and disease risk with mortality or damage from western pine beetle. Pinyon-juniper vegetation types include mortality and damage from pinyon ips.

The Forest continues to feel the effects of drought conditions. Below average precipitation causes increased stress on trees which can make them more susceptible to insect and disease and increase severity and intensity of wildfires. Aspen defoliation is a separate issue from sudden aspen decline (SAD), which appears to be drought related and not driven by insects or diseases. Recent drought and dry weather may have an impact on aspen health and potentially increase the occurrence of SAD in the state (NM State Forestry 2012). Drought conditions also affect availability of water resources, which are highly sought by recreationists as well as wildlife.

Human Caused Disturbance

Management activities include livestock grazing, wildlife habitat improvement, other vegetation management, prescribed fire activity, communication sites, utility lines, travel management, developed recreation including campground and downhill skiing, and dispersed recreation use including but not limited to camping, hunting, hiking, caving, backpacking, and motorized use on designated system roads and trails. About half of the Forest lands within this subsection are in the highest elevations of the Santa Fe Mountains within the Pecos Wilderness Area. Management activities within this part of the subsection are not noticeable, leaving the valued scenic character intact or unaltered with only minute if any deviations. The existing scenic character and sense of place is expressed at the highest possible level.

Livestock grazing occurs throughout with noticeable changes to the landscape when looking at grazed and ungrazed grasses, range fences, livestock trails, and water developments. Vegetation management to improve range condition may include prescribed fire, herbicide treatment. These management activities may be noticeable when viewed in the foreground distance zone, but typically do not dominate the landscape. These types of activities occur in an overall naturally appearing landscape with minor deviations when structures or developments are viewed.

Wildlife habitat management has occurred in the Davis-Willow area in the Pecos River drainage and may include opening rehabilitation or precommercial thinning. Other wildlife habitat management across the subsections may include water developments and structural improvements.

Various vegetation management activities are scattered throughout the subsections with regeneration, intermediate and selective harvest types with both commercial and pre-commercial components. Regeneration harvest types can sometimes dominate the landscape depending on shape and concentration of harvest units and concentration of roads. The landscape appears slightly altered from these activities in this subsection. Most intermediate and selective harvest prescriptions are not noticed by forest visitors once slash disposal has occurred and skid trails are revegetated. Pre-commercial vegetation treatments are often not noticeable once slash disposal has occurred or lop and scatter slash begins to blend with the surrounding vegetation.



Figure 44. Views of vegetation treatments along Mineral Hill Road (NFSR 18)

The effects of prescribed fire on the landscape are naturally appearing since fire edges typically follow natural vegetative patterns and terrain features. The effects of prescribed fire typically go unnoticed by forest visitors after a few years, depending on project objectives and amount of moisture received.

Most of the subsection, since it is designated wilderness, is accessed through non-motorized trails. Within these subsections, roads present are suitable for passenger cars, roads suitable for high clearance vehicles only, and close or administrative use roads. Roads more easily traveled, suitable for passenger cars or designed for user comfort, provide access throughout the subsection and include: Interstate 25, US and State Highways such as NM Highways 475, 63, 276, and 105, County Roads, and main NFS roads. NM Highway 475, the Santa Fe National Forest Scenic Byway, provides access to the Santa Fe Ski Area and other developments. Some of the main NFS roads providing access include: Holy Ghost Road (NFSR 122), Winsor Creek Road (NFSR 121), Panchuela Road (NFSR 305), Jacks Creek Road (NFSR 555), Pecos Barilla Road (NFSR 83), Gallinas Road (NFSR 263), and Johnson Mesa Road (NFSR 156). Rio la Casa Road (NFSR 113) provides access to the northeastern portion of the subsection, and Borrego Mesa Road (NFSR 306) provides access to the northwestern portion of the subsection. These roads, secondary roads, motorized trails, and non-motorized trails are the primary access and platform for viewing scenery and may occur in otherwise naturally appearing landscapes.



Figure 45. Typical road corridor along Pacheco Canyon (NFSR 102)

Communication sites, utilities, and ski area development are the most noticeable alterations in this landscape when they are viewed. Communication sites with multiple towers may dominate a view due to the strong linear features added to the landscape above a shrub or tree canopy and landform features and vegetative clearing for facilities.



Figure 46. Communication site near Santa Fe Ski Area. This activity is less noticeable from further distances, but dominates the landscape when viewed from closer distances.



Figure 47. Communication site near Santa Fe Ski Area. This activity is less noticeable from further distances (this photo is zoomed in, in order to see the towers), but dominates the landscape when viewed from closer distances.

Major power or utility lines are located throughout the subsection. Major utility corridors often dominate the landscape when viewed either with large vertical structures or vegetative clearing

making the landscape appear heavily altered. Where vegetative clearing is not needed or minimized, these activities result a landscape which generally appears moderately altered.

Santa Fe Ski Area is located within this subsection at the top of the Santa Fe Scenic Byway. The ski area developments moderately alter the scenic character when viewed from the base, as shown below. However, the ski trails and clearing for ski lifts strongly dominate views from further distances, such as those from US Highway 285.



Figure 48. Santa Fe Ski Area from base.

Most road surfaces within the campgrounds and picnic areas along NM Highway 435 and NM Highway 63 are paved. Campgrounds and picnic areas located away from main recreation corridors tend to have gravel, native or dirt surfaced roads. Generally, these recreation activities do not dominate the landscape, borrowing colors, materials, and scale from surrounding landscape features and appear slightly altered.

Dispersed recreation, primarily in the forms of primitive camping, dispersed camping, hunting, hiking, backpacking, driving for pleasure and other motorized use on designated roads and trails occur across the area. The landscape appears unaltered from these activities.

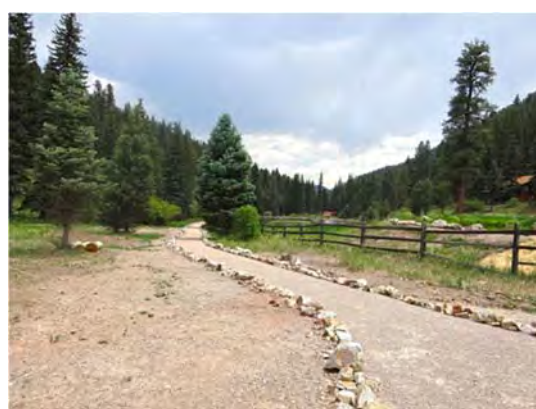


Figure 49. Little Tesuque Picnic Area (on the left) Cowles Pond recreation developments (on the right)



Figure 50. Jacks Creek Campground and Trailhead, an example of moderate existing scenic integrity in close views transitioning to high and very high existing scenic integrity in farther views of the Pecos Wilderness.



Figure 51. Campsite in Porvenir Campground

M331Gk – Brazos Uplift

The description of this subsection will focus on the portion within the Santa Fe National Forest.

Social Component

Valued Landscape Attributes

This ecological subsection covers the southern portions of the Rio Chama Wild and Scenic River and lower elevations of the Chama River Canyon Wilderness on the Coyote Ranger District. Chama River Canyon is multi-colored sandstone canyon which is at times 1,500 feet deep. Towering cliffs, heavily wooded side canyons and historical sites offer unique scenery viewing opportunities. Major narrow and steep wooded side canyons are also distinctive contributions to the scenic character of the area. Multi-colored red and tan sandstone cliffs contrasting with the greens of sagebrush, pinyon juniper, and ponderosa pine characterize the area. Rio Chama meanders through this distinctive canyon and the bright greens of riparian vegetation, which turn colors in the fall, is a unique setting on the Forest. Vegetative patterns are mostly riparian along the river, sagebrush, juniper and pinyon pine-juniper woodlands in the lowlands, and ponderosa pine-Douglas fir mix as elevations increase. In the fall riparian vegetation adds breathtaking colors to the landscape. Rugged canyons and badland rock outcrops along with the vegetation mix provide for distinctive scenic attractiveness in much of the subsection. Rio Chama, Rio Gallina, and Rio Puerco DeChama are distinctive water features. Visitors are drawn to the beauty of the rugged canyons, cool waters for swimming and non-motorized boating, and open spaces offering mostly uncrowded experiences once away from the Chama Canyon Road (NFSR 151). The terrain varies from gently sloping bottoms lands to steep ridges, canyons and escarpments. The landscape has a special place in history including pre-historic and historic ruins seen from the

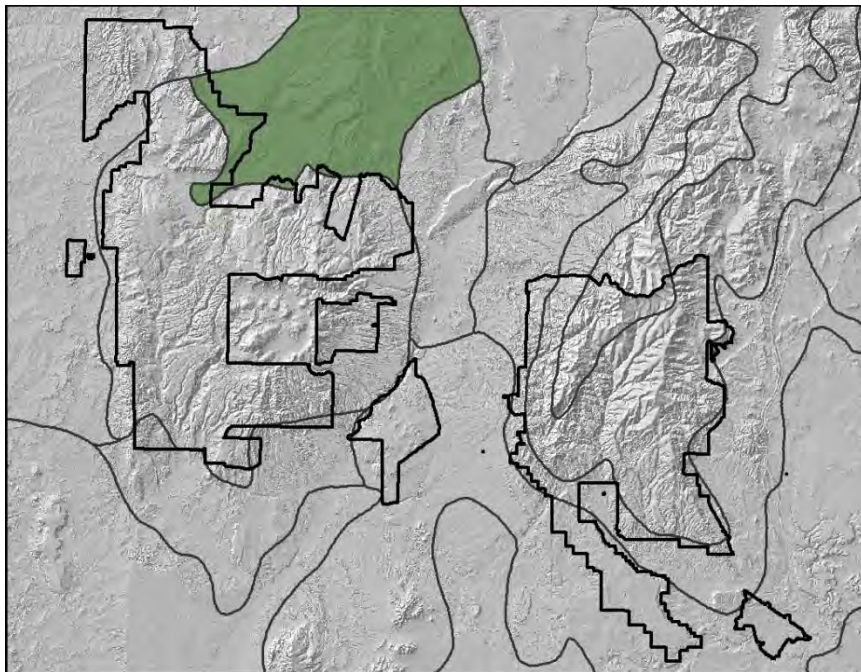


Figure 52. M331Gk – Brazos Uplift Subsection Map

main access road and the Monastery of Christ in the Desert at the road's end. Recreation sites along Chama River Road (NFSR 151), a portion of the Continental Divide National Scenic Trail, (T813), and Potrero Trail (T76) are other popular sights of interest. Rio Chama, Rio Gallina, Chavez Canyon, and Rio Puerco DeChama are the main perennial streams.

Special or Distinctive features

The Rio Chama is a major tributary of the Rio Grande in northern New Mexico. It flows through a multi-colored sandstone canyon which is at times 1,500 feet deep, and through a designated

wilderness area and inventoried roadless areas on the Forest. Towering cliffs, heavily wooded side canyons and historical sites offer an outstanding wild river backdrop for the fisherman or float boater (NWSRS 2014).



Figure 53. Chama River Canyon Wilderness, an example of very high existing scenic integrity.

Other Special or distinctive features include:

- ◆ Chama River Canyon Wilderness for its solitude, high scenic quality and unaltered scenic integrity
- ◆ Numerous side canyons: Chavez Canyon, Rio Gallina, Joaquin Canyon, Canada de la Presa, Ojitos Canyon, Canada de las Fuertes, Canada del Portero, and Huckaby Canyon and Rio Cebolla just to the north of the subsection
- ◆ Ruins in the Chama River Canyon such as Poshuouinge Interpretive Site, which lies in the lower Chama valley, is ancestral to the Tewa Indians, who presently live in a series of pueblos near Española. Poshuouinge is located next to US Highway 84.
- ◆ The brightly colored cliffs and badlands of this and surrounding areas were made famous by the paintings of Georgia O’Keeffe.



Figure 54. Ruins in foreground in Chama River Canyon (on the right)

Water Resources and Wild and Scenic Rivers

Water is a valued resource within this subsection. Rio Chama, Rio Gallina, Chavez Canyon, Rio Puerco DeChama, and lower portions of El Rito Encino and Agua Sarca are the major perennial

streams. Intermittent streams also occur throughout the subsection. Abiquiu Reservoir is a major waterbody occurring off-forest in the subsection, but adds to the overall Forest setting.

Rio Chama is a nationally designated wild and scenic river with wild and recreational designations in this subsection. Including portions within the Brazos Uplift and Chaco Basin High Desert Shrubland Subsections about 21.5 miles are designated wild and about 9.5 miles are designated recreational. The outstandingly remarkable values on the Forest for the Rio Chama are: scenery, recreational, geological, wildlife, and cultural/historic. Scenic values are chiefly related to the layering of intensely colored shale, sandstone, limestone, and gypsum, ranging from grey, to pink, to white. Canyon reaches 1,500 feet at maximum depth. Interaction with thick coniferous forest at some points heightens effects of colors (USDA FS 1987).



Figure 55. Rio Chama in north end of Chama River Road (NFSR 151) corridor

Recreation Opportunities

Recreation opportunities are developed and dispersed. Developed recreation sites are concentrated on Chama River Road (NFSR 151), including campgrounds, day use sites, and boat launches. Popular recreation activities include camping, picnicking, trout fishing, non-motorized boating (float boating), dispersed camping, hiking, horseback riding, and driving for pleasure on system roads. Back country camping and backpacking are available in Chama River Canyon Wilderness. Driving for pleasure and viewing scenery is popular along NM Highway 96, along the southern portion of the subsection through the Forest, and Chama River Road (NFSR 151).

Chama River Canyon Wilderness and Rio Chama Wild and Scenic River

Chama River Canyon Wilderness totals about 50,300 acres. The Rio Chama Wild and Scenic River, which is popular among river rafters and canoeists, runs through six miles of the Wilderness. The remainder of the Rio Chama Wild and Scenic River is located outside of wilderness between the two sections of the Wilderness in the canyon bottom and north of the Wilderness.

Water rafting and primitive camping are popular along Rio Chama. Floating the river offers access to many interesting side canyons with trails leading to peaks and mesa tops. Float boaters

enjoy two or three day trips on Class II rapids on the entire 31-mile segment (advance permits required), or half day trips on the lower segment (no advance permits required) (NWSRS 2014). Trout often flourish in the river, and onshore residents include mule deer, black bears, elk, coyotes, and mountain lions (Chama River Canyon Wilderness 2014).

Rio Chama's beauty is so impressive that most use is concentrated there with little use occurring in the grassland that dominates the upland portion of the area. Trail access is minimal above the colorful sandstone bluffs and lovely rock formations that rise to high rims on both riverbanks. Continental Divide National Scenic Trail through Continental Divide National Scenic Trail (T813) crosses the Wilderness through Joaquin Canyon and Ojitos Canyon and Potrero Trail (T76) through Canada del Portero. Varying canyon elevations also provide a wide range of vegetation, from low-lying pinion-juniper woodland to ponderosa pine and fir (Chama River Canyon Wilderness 2014).

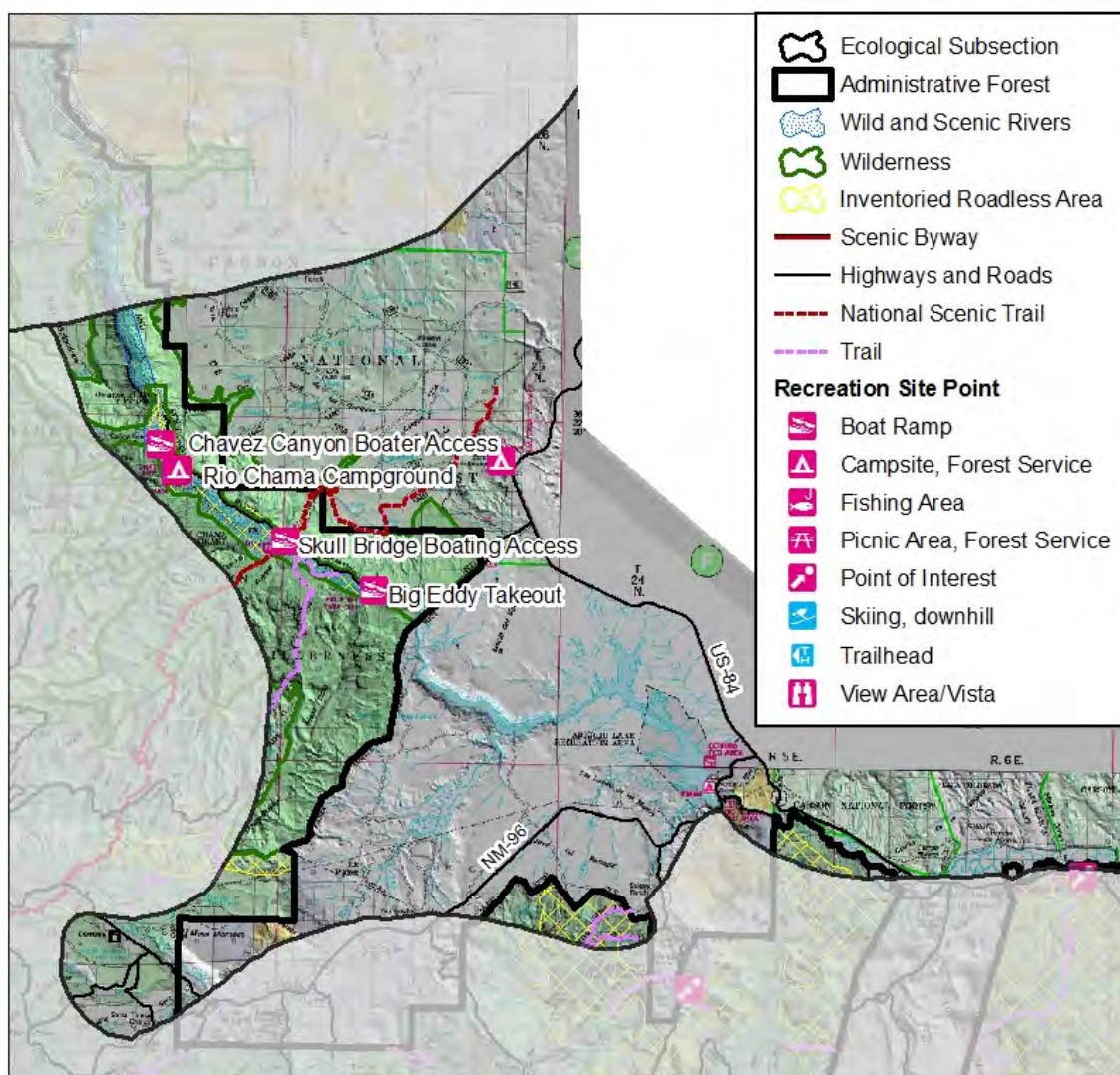


Figure 56. Recreation Opportunities Map for the Brazos Uplift Subsection



Figure 57. Rio Chama at Big Eddy Takeout

Cultural Ecology

A boater's guide brochure for the Rio Chama Wild and Scenic River (USDI BLM date unknown) includes history of the area as follows:

People probably first entered the Rio Chama Valley around 12,000 years ago. For thousands of years, they hunted and foraged, raveling with the season to take advantage of available wild plant and animal resources.

Native people began to farm as populations increased. Some of the earliest evidence of agriculture in the United States has been found in the Rio Chama Valley. The Tewa Pueblos are the direct descendants of these early settlements. Even so, the Chama Canyon remained remote, with widely dispersed, small fortified settlements.

Arriving Europeans found the canyon inhabited by the Jicarilla Apaches. The Spanish began building in the Rio Chama Valley in the early 1700s. Navajo, Utes, Apache, and Comanche frequented the area for hunting, grazing, trading, and occasional raids.

In 1750, Abiquiu was permanently settled. In the 1850s, with the forced removal of the Utes and other tribes, successful Hispanic homesteads and communities were established throughout the Rio Chama Valley.

In the early 20th century, the area was well known because of the town of El Vado (now under the reservoir). Forested areas were logged and rail lines built which contributed to the increased populations. The Ward Ranch originated as a homestead during this era.

Ecological Component

Included in the South-Central Highlands Ecological Section (M331G), this subsection is located in north central New Mexico in the Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow physiographic province. The Brazos Uplift Ecological Subsection (M331Gk) within the Santa Fe National Forest includes over 30 Terrestrial Ecological Unit (TEU) map units and the following GTES map units: 135, 137, 160, 161, 349, 421, 434, 440, 441, and 501. The ecological component below is summarized from Ecological Subregions of the United States (McNab and Avers 1994c), Landscape character types of the national forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991).

Dominant Environmental Regimes

Landform/ Geomorphology

The South-Central Highlands ecological section is characterized by mountains dissected by narrow stream valleys with steep gradients. High walled plateaus and steep walled canyons are common. Soils formed in this area are of sandstones, siltstones, shales, and carbonates (McNab and Avers 1994c). The area is characterized by horizontal sandstone beds that have been subject to great erosion creating tablelands, rock terraces, canyons, and dry washes (USDA FS 1989).



Figure 58. Landforms of the Rio Chama Canyon from NFSR 151 entrance from the south.

General Ecosystem Survey characterizes the landforms on the Forest as valley plains, elevated plains, hills, hills and mountains, mountains, and escarpments. Major landforms within the Forest include Rio Chama Canyon, numerous side canyons, and the surrounding mesas. Detailed soils information can be found in McNab and Avers (1994c).

Table 5: Landforms by General Ecosystem Survey map units for the Brazos Uplift Subsection

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
135	elevated plains
137	mountains, escarpments
160	elevated plains
161	hills/mountains
349	hills/mountains, mountains, escarpments
421	hills, elevated plains, escarpments
434	hills, elevated plains, escarpments
440	valley plains
441	valley plains
501	valley plains

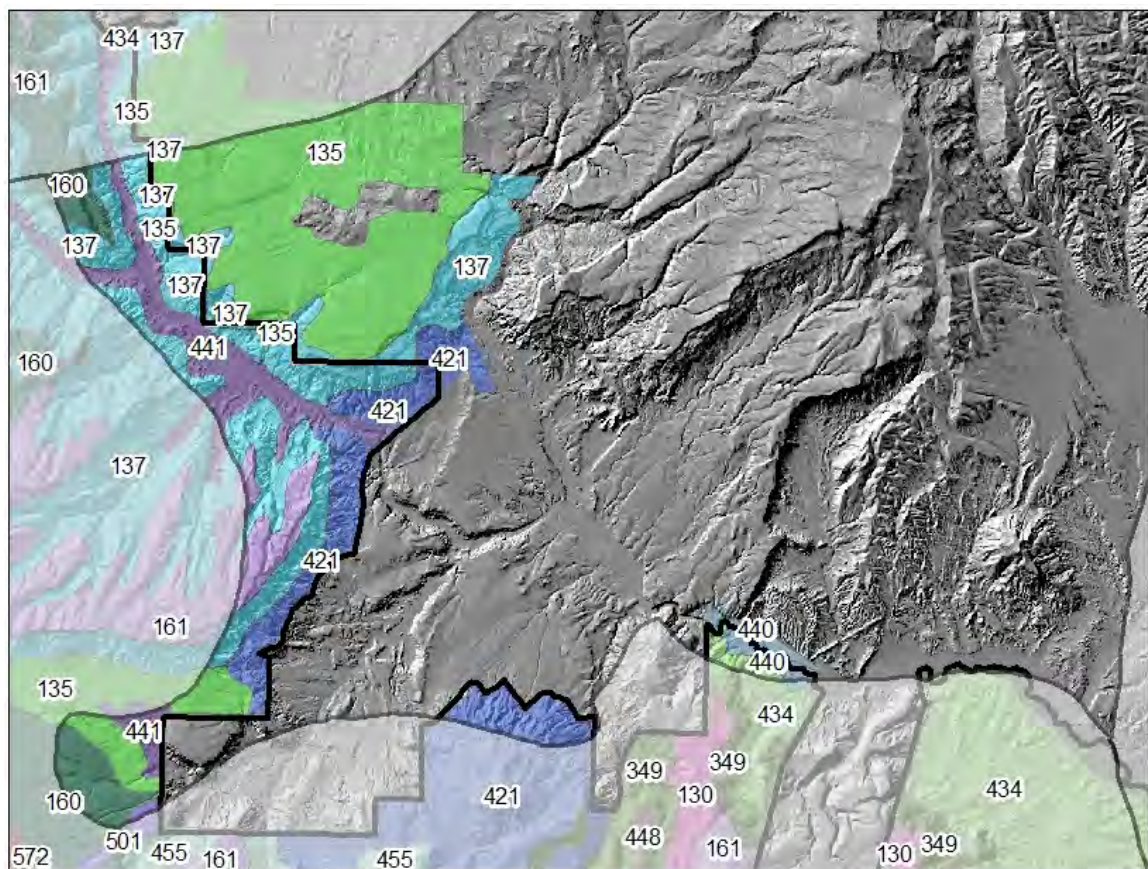


Figure 59. General Ecosystem Survey map units for the Brazos Uplift Subsection

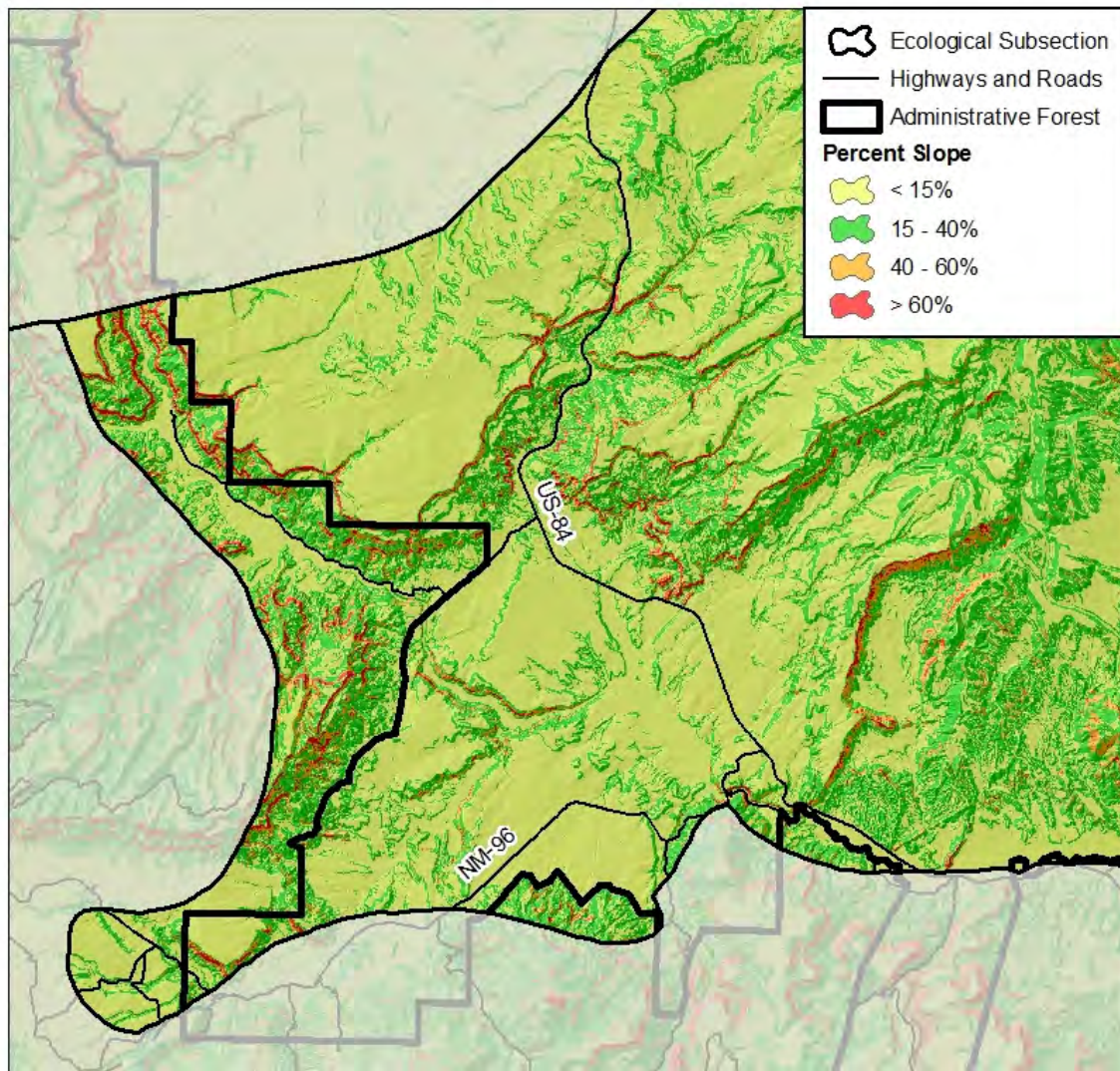


Figure 60. Topography map using percent slope for the Brazos Uplift Subsection

Climate

Precipitation ranges from 15 to 30 inches (370 to 750 millimeters). Temperature averages 32 to 45 °F (0 to 7 °C). The growing season last less than 70 days (McNab and Avers 1994c).

Surface Water Characteristics

Across the ecological section, water from streams and lakes is abundant, and ground water is plentiful (McNab and Avers 1994c). Perennial streams include: Rio Chama, Rio Gallina, Chavez Canyon, Rio Puerco DeChama, El Rito Encino, and Agua Sarca. Rio Chama is a nationally designated wild and scenic river. Many intermittent streams are found throughout the subsection. Few natural or artificial lakes are located within the Forest in this subsection.

Existing Vegetation

The vegetation within NFS lands varies across the subsection depending on elevation, aspect, and soils influencing vegetative patterns. At a broad scale, pinyon-juniper woodland, ponderosa pine mix, plains grassland, saltbush, and sagebrush dominate most of the area. Stringers of riparian

deciduous forest and woodland occur along water courses. Vegetation can be open to sparse with bare soil and bare rock common (USDA FS 1989).

The vegetation types at the midscale level are discussed by dominance type. The canyon bottom is dominated by juniper and a mix of deciduous shrubs and perennial grasses and blue grama. The vegetation mix transitions to pinyon-juniper woodlands and ponderosa pine forest mix as elevations increases. Ponderosa pine is mixed in pinyon-juniper at lower elevations and Douglas fir at higher elevations. Along NM Highway 96, big sagebrush and pinyon-juniper is most common. Riparian vegetation along Rio Chama, Rio Gallina, and Rio Puerco add distinctive textures and colors in the fall. A figure on the next page depicts the most prominent existing vegetation using midscale vegetation mapping dominance types.



Figure 61. Rio Gallina drainage viewed from end of Chama River Road (NFSR 151)



Figure 62. Vegetation at a Rio Chama picnic area

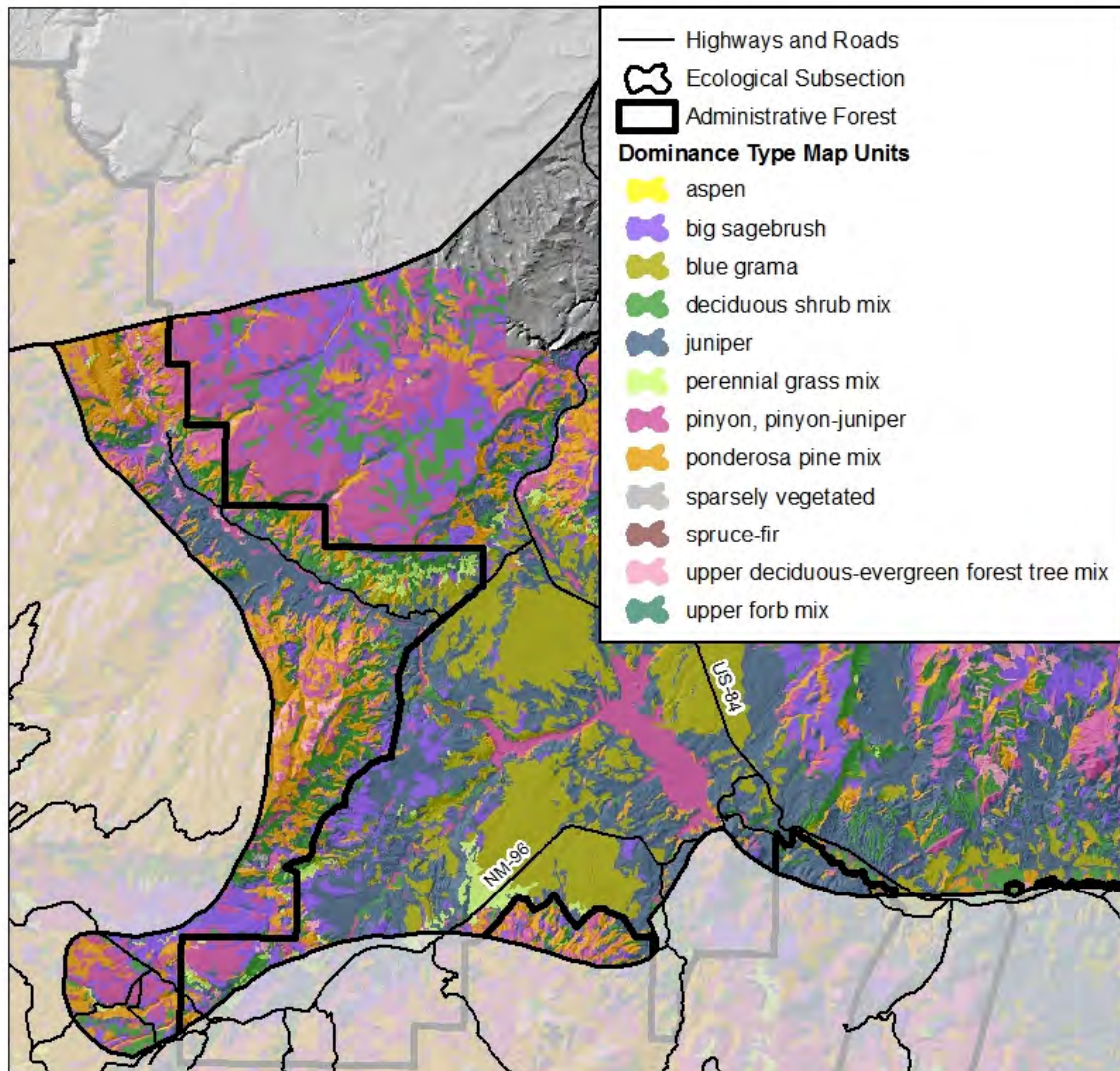


Figure 63. Midscale Vegetation Dominance Types for the Brazos Uplift Subsection

Potential Natural Vegetation

At a broad scale, vegetation ranges from shrub and grasslands and forests. Vegetation is also classified pine-Douglas-fir forest, Great Basin sagebrush, and juniper-pinyon woodland (McNab and Avers 1994c).

Potential Natural Vegetation types are depicted with Terrestrial Ecosystem Survey vegetation types, as shown in the following figure. Several vegetation communities occur on NFS lands within this subsection. Alder, cottonwood, and willow riparian vegetation occurs along Rio Chama and Rio Gallina. Sagebrush and rabbitbrush occurs in the canyon bottom. Pinyon-juniper dominates above the canyon bottom and transitions to ponderosa pine mix as elevation increases with some spruce, fir, pine mix at the highest elevations.

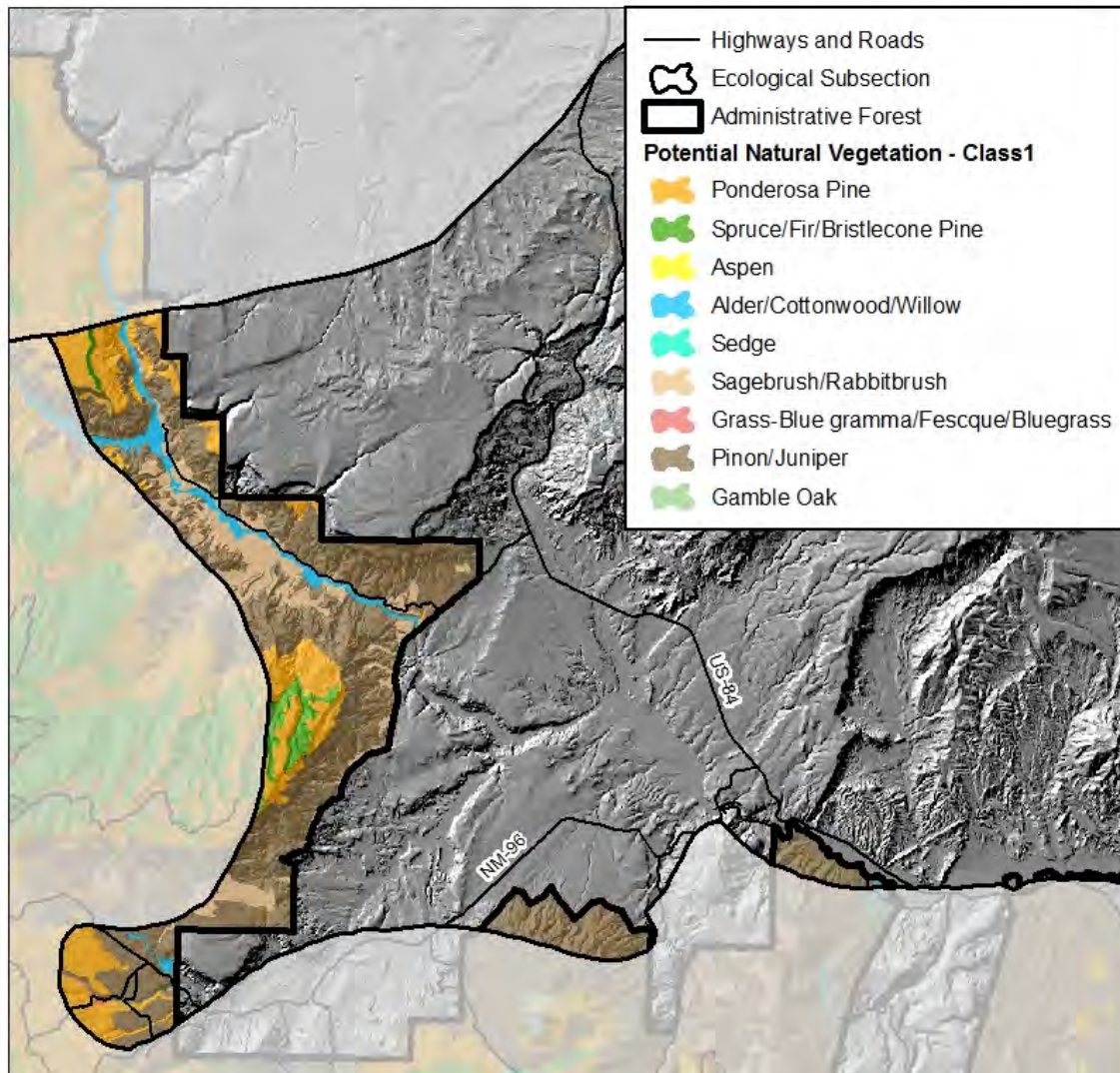


Figure 64. Terrestrial Ecosystem Survey Vegetation Types for the Brazos Uplift Subsection

Disturbance Regimes

Across the ecological section, fire, insects, and disease are principal sources of natural disturbance (USDA FS 1994c). Wildfires vary in frequency and intensity within the vegetation type represented in this ecological subsection. Fires also vary in frequency and intensity, depending on fuel load and moisture. The historic fire regime over much of the area in pinyon-juniper and sagebrush dominated areas is 35 to 200 year fire return interval with low and mixed severity. Some ponderosa pine areas have a fire regime group of less than 35 year fire return interval with low and mix severity (LANDFIRE 2014a). The vegetation within this subsection is mostly low departure in pinyon-juniper types with moderate departure in sagebrush and ponderosa vegetation types (LANDFIRE 2014b). The level of vegetation departure is departure from the fire regime groups and is dependent on the vegetation communities present. Some areas in pinyon-juniper and sagebrush vegetation have high departure from their fire regime groups (LANDFIRE 2014b). Several fires, including Prieta Fire of 2000 (about 1,150 acres) and Alta Fire of 2008 (about 830 acres), have shaped the landscape setting in this ecological subsection. Other natural disturbances include insect and disease risk in ponderosa pine mix and pinyon-juniper vegetation types with mortality from Douglas-fir beetle, fir engraver, and pinyon ips.

The Forest continues to feel the effects of drought conditions. Below average precipitation causes increased stress on trees which can make them more susceptible to insect and disease and increase severity and intensity of wildfires. Drought conditions also affect availability of water resources, which are highly sought by recreationists as well as wildlife.

Human Caused Disturbance

Management activities include livestock grazing, vegetation management to improve range condition, other vegetation management, prescribed fire activity, utilities, travel management, developed recreation and dispersed recreation use including but not limited to camping, picnicking, primitive camping, water rafting on Rio Chama, hunting, hiking, and motorized use. About half of the Forest lands within this subsection are within the Chama River Canyon Wilderness Area. Management activities within this part of the subsection are not noticeable, leaving the valued scenic character intact or unaltered with only minute if any deviations. The existing scenic character and sense of place is expressed at the highest possible level.



Figure 65. Rio Chama entrance from south along Chama River Road (NFSR 151).

Livestock grazing occurs throughout with noticeable changes to the landscape when looking at grazed and ungrazed grasses, range fences, livestock trails, and water developments. Vegetation management to improve range condition may include prescribed fire, herbicide treatment. These management activities may be noticeable when viewed in the foreground distance zone, but typically do not dominate the landscape. These types of activities occur in an overall naturally appearing landscape with minor deviations when structures or developments are viewed.

Various vegetation management activities are located in the vicinity of NM Highway 96 in this subsection with mostly fuels reduction and pre-commercial components. The landscape appears slightly altered from these activities in this subsection. Most fuels reduction activities are not noticed by forest visitors once slash disposal has occurred and skid trails are revegetated. Pre-commercial vegetation treatments are often not noticeable once slash disposal has occurred or lop and scatter slash begins to blend with the surrounding vegetation.

The effects of prescribed fire on the landscape are naturally appearing since fire edges typically follow natural vegetative patterns and terrain features. The effects of prescribed fire typically go unnoticed by forest visitors after a few years, depending on project objectives and amount of moisture received.

Utilities are the most noticeable alterations in this landscape when they are viewed along NM Highway 96 and its vicinity. Major power or utility lines are located throughout the subsection. Major utility corridors often dominate the landscape when viewed either with large vertical structures or vegetative clearing making the landscape appear heavily altered. Where vegetative clearing is not needed or minimized, these activities result a landscape which generally appears moderately altered.

Within this subsection, most roads present within the area are suitable for high clearance vehicles only. Roads more easily traveled, suitable for passenger cars, provide access throughout the subsection and include: US Highway 94, State Highways 96, County Roads, and main NFS roads. Some of the main NFS roads providing access include: Chama Canyon Road (NFSR 151), Mesa Poleo Road (NFSR 62), and Agua Sarca Road (NFSR 172). These roads, secondary roads, motorized trails, and non-motorized trails are the primary access and platform for viewing scenery and may occur in otherwise naturally appearing landscapes.

Most road surfaces within the campgrounds and picnic areas have gravel, native or dirt surfaced roads. Generally, these recreation activities do not dominate the landscape, borrowing colors, materials, and scale from surrounding landscape features and appear slightly altered.

Dispersed recreation, primarily in the forms of dispersed camping, hunting, hiking, and motorized use occur across the area. The landscape appears unaltered from these activities.



Figure 66. Rio Chama Campground

M331Gm – Jemez and San Pedro Mountains

The description of this subsection will focus on the portion within the Santa Fe National Forest. The North Central Rio Grande Intermontaine (315Hb) and Southern San Louis Hills (331Jd) subsections will be covered in the scenic character description of this ecological subsection. Chama River Canyon Wilderness, although partially in this subsection, will be fully described with the Brazos Uplift subsection (M331Gk).

Social Component

Valued Landscape Attributes

This ecological subsection covers the Jemez Ranger District as well as portions of the Cuba, Coyote, and Española Ranger Districts, including the Jemez, San Pedro, and Nacimiento Mountains. The area is characterized by mountains mostly having rounded and smoothed crests and sharp V-shaped canyons with steep walls. The area is a maturely dissected plateau with streams spaced relatively far apart. The Nacimiento Mountains are flat topped ranges along the western boundary of the area. A series of impressive hogback ridges stretch nearly 40 miles along the west face of the Nacimiento Mountains. The Jemez Mountains have thick ash falls and tuffs that have weathered to form interesting cliffs and by sedimentary beds that have eroded to expose colorful formations of yellow sandstone and dazzling red beds. The San Pedro Mountains are high, moist, rolling mountaintops. The Valle Grande, one of the world's largest calderas is found within the Jemez Mountains in the Valle Caldera National Preserve (USDA FS 1989). Bandelier National Monument, also in this subsection, includes rugged but beautiful canyon and mesa country. Jemez National Recreation Area is made of dramatic landscapes with breathtaking views of sheer cliff faces, pock-marked tuff exposures, flat topped mesas, lush canyon bottoms. Vegetative patterns vary with elevation, aspect, moisture, and topography. Throughout the subsection, lower elevations are dominated by pinyon pine and juniper, which transitions to ponderosa pine forest mix as elevation increase. The ponderosa pine mix changes to deciduous-evergreen forest mix with more aspen, spruce, and fir mixing with pine types. Aspen dominates many areas along the western portions of the subsection in the Nacimiento and San Pedro Mountains. The highest elevations along 31 Mile Road (NFSR 144) and in the San Pedro Parks Wilderness are dominated by spruce-fir forests with numerous meadows and large grassy "parks." A combination of high elevation and abundant moisture result in a beautiful array of color from flowering plants during the summer months in the San Pedro Mountains.

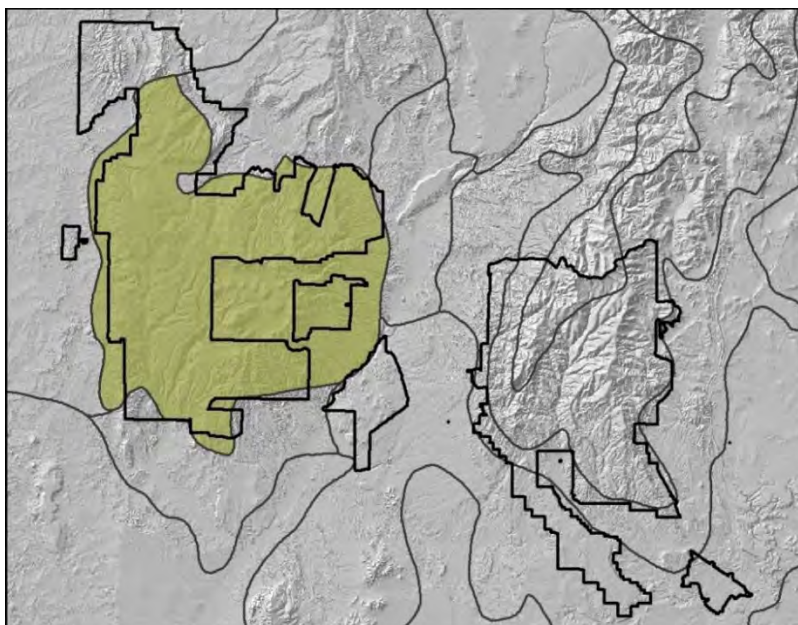


Figure 67. M331Gm – Jemez and San Pedro Mountains Subsection Map

In the fall riparian vegetation, oaks and aspens add breathtaking colors to the landscape. Rugged canyons and colorful rock outcrops, high elevation deciduous and evergreen mix, and sought after streams and riparian corridors provide for distinctive scenic attractiveness throughout much of the subsection. There are a number of distinctive water features including Jemez River, East Fork Jemez River, Rio Guadalupe River, San Antonio Creek, Jemez Falls, Spence Hot Spring, San Antonio Springs, and San Gregorio Lake, to name a few. Visitors are drawn to the beauty of rugged canyons, dramatic landscapes, cool waters, recreation opportunities, and open spaces. The landscape has a special place in history with prehistoric ruins and historic sites. Jemez Mountain Trail National Scenic Byway, Puye Scenic Byway, Cañones National Recreation Trail (T102), Continental Divide National Scenic Trail, Gilman Tunnels on NFSR 376, and East Fork Jemez National Wild and Scenic River are other popular sights of interest. Most streams are perennial streams; some are intermittent.



Figure 68. Rock formations and mesas in the Jemez National Recreation Area



Figure 69. View north of NM Highway 96 on the Coyote Ranger District.

Special or Distinctive features

Jemez National Recreation Area provides for outstanding scenery viewing and recreation opportunities and dramatic, colorful, and distinctive landscapes. Steep, rugged cliffs of red, tan, and cream colors also add unique variety and distinctiveness to landscapes north of NM Highway 96 on the Coyote Ranger District.

Other Special or distinctive features include:

- ♦ San Pedro Parks and Dome Wilderness Areas offer solitude, very high scenic integrity and wilderness experiences.
- ♦ Bandelier National Monument and Valle Caldera National Preserve have distinctive landscape features in this subsection, including rugged canyons, sweeping valleys, and Redondo Peak. However, this scenic character description will focus on the Santa Fe National Forest.

- ◆ Soda Dam, along the Jemez Mountain Trail National Scenic Byway, is a natural dam formed by thousands of years of minerals from a natural spring. A variety of hot-spring sources exist in the area of Soda Dam, including several small seeps, which can be found in the small cave adjacent to the dam.
- ◆ A number of distinctive water features include but not limited to: Jemez River, East Fork Jemez River, Rio Guadalupe River, San Antonio Creek, Jemez Falls, Spence Hot Spring, San Antonio Springs, and San Gregorio Lake, to name a few. The associated riparian vegetation adds color and variety to these areas.
- ◆ Gilman Tunnels are on Forest Road 376, the most highly travelled Forest Road on the forest. They were part of the former Santa Fe Northwestern Railway through the canyon which was used to haul lumber from the Jemez Mountains.



Figure 70. Soda Dam along the Jemez Mountain Trail National Scenic Byway



Figure 71. Rio Guadalupe and Gilman Tunnels in the Jemez National Recreation Area

- ◆ Popular hot springs are located within this subsection. Spence Hot Spring, accessed by a short hike, includes a small pool that accommodates a low number of people. San Antonio Hot Springs, accessed by a 5 mile hike, is a collection of hot springs flowing out of a steep hillside and forming several usable pools. The springs' source was bolstered by the Civilian Conservation Corps (CCC) in the 1930s to ensure a regular flow. The viewshed of the surrounding valley, creek, and forest is exquisite. The only improvement has been the formation of several rock-lined pools. McCauley is about a 1.5 mile hike from Battleship Rock and another 1.5 miles to the waterfall. The springs are beautiful with crystal clear, warm water. The top pool is about 30 feet wide and 2-3 feet deep and there are a few smaller, deeper pools downstream.
- ◆ Rock formations, such as Battleship Rock and Tea Kettle Rock are unique features. Tea Kettle Rock Interpretive Site, on Forest Road 103 in the Jemez Mountains, includes a rock formation named for its distinctive and largest arch, which spans 12 feet and is formed from red sandstone.

- ◆ Tsi Pin Pueblo, also called Tsi'pin or Tsi'pinouinge, is a remarkable pueblo ruin located on Pueblo Mesa near the village of Cañones in the northern Jemez Mountains. Although the site is on Santa Fe National Forest land, numbers of visitors are limited per day by permit. Tsi Pin was occupied between 1200 AD and 1325 AD. The village had somewhere between 335 to 400 ground floor rooms, sixteen kivas, and a central plaza.



Figure 72. Tea Kettle Rock (on the left) and Tsi Pin Pueblo (on the right)

Water Resources and Wild and Scenic Rivers

Water is a valued resource within this subsection as streams, water bodies, and springs. Perennial streams are found throughout including but limited to: Jemez River, East Fork Jemez River, Rio Guadalupe River, San Antonio Creek, Santa Clara Creek, Rio de las Vacas, Rio Cebolla, Cañones Creek, Coyote Creek, Palvadera Creek, San Juan Canyon, Peralta Canyon, Cochiti Canyon, and Frijoles Canyon. Intermittent streams also occur throughout the subsection. San Gregorio Lake is a man-made reservoir which serves as an irrigation catchment as well as a stocked fishery. Popular hot springs include Spence Spring, San Antonio Hot Springs, and McCauley. Jemez Falls, a cascade dropping more than 100 feet, is a distinctive feature along East Fork Jemez River (USDA FS 2002a).

East Fork Jemez River is a nationally designated wild and scenic river with wild, scenic and recreational designations. Scenery is an Outstandingly Remarkable Value. Scenic values are of the Valles Caldera, the rugged Valles Rhyolite cliffs, interactions of rock, vegetation, and water (USDA FS 1987). Scenic attractions include striking views of conifer-covered mountain peaks, open mountain meadows, impressive volcanic rock formations, dazzling multicolored rock cliff faces, and a tumbling river with its lush vegetation. The color, variety, and vastness of the landscapes are unique when compared to the arid landscapes beyond the Jemez Mountains (USDA FS 2002a).

The 1987 Forest Plan lists Rio Guadalupe and Cañones Creek as eligible wild and scenic rivers, but they were not recommended for inclusion in the National Wild and Scenic River (NWSR) System in the 1987 Forest Plan. Cañones Creek scenic values are related to the enclosed canyon with mesas defining the rims (USDA FS 1987). Rio Guadalupe scenic values center on a short stretch around the Guadalupe Box (USDA FS 1987). Rio Cebolla, San Antonio Creek, East Fork Jemez, Jemez River, and Rio Guadalupe are also listed as key fishing opportunities (USDA FS 2002b).

Table 6: Jemez and San Pedro Mountains Subsection Designated and Eligible Wild and Scenic Rivers (USDA FS 1987, 2002a, 2010a)

River	Designation or Status	Outstandingly Remarkable Value
East Fork Jemez	Designated Wild (4.0 miles) Designated Scenic (5.0 miles) Designated Recreational (2.0 miles)	Scenery, Recreational, Geologic, Ecological, Fisheries, Wildlife
Rio Guadalupe	Eligible, but not recommended for inclusion in the NWSR System in 1987 Forest Plan	Scenery, Geological, Wildlife, Cultural/Historic
Cañones Creek	Eligible, but not recommended for inclusion in the NWSR System in 1987 Forest Plan	Scenic, Recreational, Fisheries, Wildlife, Cultural/Historic

For eligible streams, the Outstandingly Remarkable Value listed were identified for at least one segment in the Environmental Impact Statement for the 1987 Forest Plan (USDA FS 1987)



Figure 73. East Fork Jemez Wild and Scenic River (on the left) and East Fork Jemez River riparian area (on the right)

Recreation Opportunities

Most of the recreation opportunities section is summarized from the draft forest plan assessment sections written by forest specialists in 2015. Recreation opportunities are developed and dispersed, both motorized and non-motorized, with numerous day use sites, campgrounds, trailheads, trails, and scenic drives. Developed recreation sites are concentrated around San Pedro Parks Wilderness and in Jemez National Recreation Area. Popular recreation activities include dispersed camping, camping in developed campgrounds, picnicking, trout fishing, hunting, hiking, horseback riding, and driving for pleasure on system roads and trails designated for motorized use. Back country camping and backpacking are available in San Pedro Parks Wilderness and Dome Wilderness. Driving for pleasure and viewing scenery is popular along NM Highways 4, 96, 126, 501, and 502, designated scenic byways discussed below, and many other Forest roads including but not limited to: NFSR 376, NFSR 10, NFSR 103, and NFSR 144. Some winter use, skiing and snowmobiling, may occur. Pajarito Mountain Ski Area is located near Los Alamos within this subsection on non-National Forest ownership.

On the Cuba and Coyote Ranger Districts, residents of this area have used local campgrounds and dispersed recreation areas, as well as trails and forest roads, for generations to hunt, fish, camp, hike, and hold family reunions. Other visitors travel from further to participate in recreation

activities including camping, fishing and hiking. Most of the campgrounds and trailheads on this District are located near San Pedro Parks Wilderness. Popular dispersed camping areas include Church Meadows and a variety of sites along the Rio de las Vacas. San Gregorio Lake is a simple less than one mile hike from the wilderness boundary. San Gregorio is frequented by local visitors to San Pedro Parks Wilderness.

The Jemez Ranger District has the majority of developed recreation sites on the Forest and received some of the highest recreation use. Outdoor enthusiasts come to hike, camp and picnic; anglers to try their luck on the numerous perennial streams, rock climbers have opportunities to challenge technical climbing skills, while others find more passive enjoyment of viewing natural settings in contrast to urban life. Many visitors come to the district to drive the highways for pleasure or to view the changing fall colors, or simply just to get away from the desert heat. The abundance of flowing water is an important resource that draws visitors to the Jemez Mountains. Dispersed camping mostly occurs along the NFSRs 376 and 10.

The Española Ranger District in this subsection has a more rural to urban character due to its proximity to Los Alamos. The proximity of forest resources, including a number of trails, to nearby residences is a valued characteristic that offers a range of opportunities that have become part of the lifestyle of those residents.

Jemez National Recreation Area

Jemez National Recreation Area Management Plan (USDA FS 2002b) contains detailed description of the Jemez National Recreation Area. Jemez National Recreation Area provides for outstanding scenery and recreation opportunities and is made of dramatic landscapes with breathtaking views of sheer cliff faces, pock-marked tuff exposures, flat topped mesas, lush canyon bottoms. The outstanding scenery is one of the main resources drawing an estimated nearly 1.6 million visitors to the Jemez National Recreation Area each year. State Highways 4 and 126 and NFSR 376 are main access roads in the area. State Highway 4 is part of the Jemez Mountain Trail National Scenic Byway. The western boundary of the national recreation area follows Rio Guadalupe corridor, the southeastern portion consist of the Jemez River corridor and San Diego Canyon, and northeastern portion follows the southern edge of Valle Caldera National Preserve. All but two of the district's developed campgrounds and one picnic area are located within the national recreation area. The two main river corridors, Rio Guadalupe and Jemez River, receive the highest recreation use. Camping, wildlife and scenery viewing, fishing, hunting, hiking, swimming, soaking in hot and warm springs, picnicking, rock climbing, horseback riding, cross-country skiing, and driving for pleasure are some of the more popular activities.

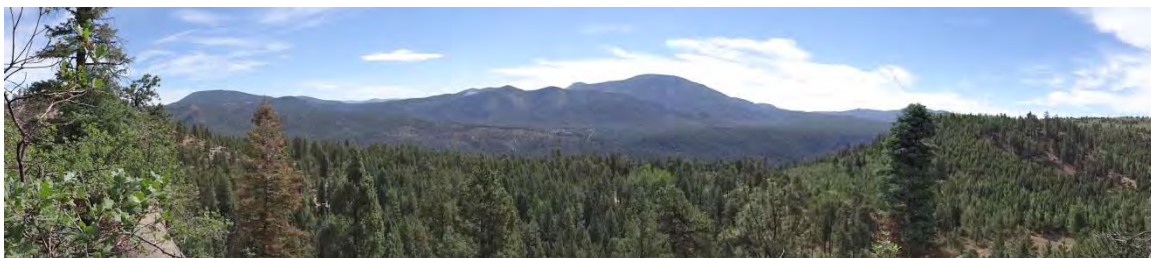


Figure 74. View from Redondo Peak from Jemez Mountain Trail National Scenic Byway

Jemez Mountain Trail National Scenic Byway

Jemez Mountain Trail National Scenic Byway travels past amazing geological formations, ancient Indian ruins, an Indian pueblo, and the Jemez National Recreation Area. Some unique stops along the route are Soda Dam (a natural dam formed by thousands of years of minerals from a natural spring), Seven Springs and the ancient cliff dwellings at Bandelier National Monument (USDA FS 2014d).

Puye Cliffs Scenic Byway

Puye Cliffs Scenic Byway is a pleasant drive through an area of low hills covered in pinyon, juniper and blue grama grass. The rolling hills start to flatten out after a few miles of driving, and the road continues to climb. Puye Cliffs is visible in the distance, and the Jemez Mountains appear on the horizon. Pinyon-juniper gives way to ponderosa pine at the base of the mesa on which Puye Cliffs are carved. The portion of the road that is open to the public ends at the cliff dwellings. This scenic byway is accessible only by tours offered by the Santa Clara Pueblo (New Mexico Tourism Department 2015a)

East Fork Jemez National Wild and Scenic River

The river corridor has long been a recreation destination for visitors from the region, as well as from around the country. Local users center their recreation activities around multi-generational family gatherings near water. For some, a hike along the Trail 137 is not complete without a relaxing dip in the natural pools at McCauley Warm Spring. Throughout the river corridor, day use is high in the summer months, and overnight use, both in developed sites and dispersed sites, occurs spring through autumn. Commonly observed activities include hiking, fishing, camping, photography and sightseeing. After snowfall, day use is again high when cross-country skiing, snowmobiling, tubing and snowshoeing are popular (USDA FS 2002a).

Cañones National Recreational Trail

Cañones National Recreation Trail is 6 miles long, begins at Cerro Pavo Trailhead and ends where it meets with Trail 102. This trail offers spectacular views of the Cañones Canyon walls. The canyon provides habitat for numerous types of wildlife. The trail is open for hiking, fishing, and equestrian or other non-motorized uses.

Continental Divide National Scenic Trail

The Continental Divide National Scenic Trail (CDNST) is a designated hiking trail running 3,100 miles between Mexico and Canada. Several sections of this trail, totaling about 40 miles, pass through the subsection. The Continental Divide National Scenic Trail crosses through the San Pedro Parks Wilderness and the Cuba and Coyote Ranger Districts from Cuba, New Mexico, to the Carson NF.

San Pedro Parks Wilderness

Although the elevation averages 10,000 feet above sea level, San Pedro Parks Wilderness is known for high, moist, rolling mountaintops with numerous meadows and large grassy “parks.” Dense stands of Engelmann spruce and mixed conifers compete for space with small stands of aspen.



Figure 75. San Pedro Parks Wilderness

San Gregorio Reservoir, a small irrigation reservoir predating the establishment of the San Pedro Parks Wilderness, is the largest body of water. Clear streams wander through the forest openings and are usually abundant with trout. There is frequent afternoon rainfall in July and August. This rainfall enables the meadows to flourish with bluegrass, oat grass, sedge, rush, and Rocky Mountain iris, only to be covered with snow in November. Campsites with abundant water appeal to backpackers, as do the nine major trails. Trails receiving the heaviest use are the Vacas Trail to San Pedro Park (T 51) and the Palomas Trail (T50), which joins the Vacas Trail (San Pedro Parks Wilderness 2014).

Dome Wilderness

The Dome Wilderness is bordered by the Bandelier Wilderness to the east. The Wilderness has primitive canyon lands and prehistoric ruins, as well as an abundance of wildflowers and strawberries in spring. Elevations peak at 8,200 feet, and then drop to 5,800 feet at Sanchez Canyon. The Saint Peters Dome Trail (6 miles) gives access to this wilderness, starting on the north end near the Dome Lookout and losing elevation as it runs south past canyon walls and through stands of large pines, then across Sanchez Creek, a fishless stream that endures periods of extremely low water. The Capulin Trail (2 miles) also begins in the northern portion of the area. The Capulin Trail ends at the Bandelier National Monument boundary (Dome Wilderness 2014). The Dome Fire in the 1990s burned the majority of the wilderness. Then in 2011, the Las Conchas Fire reburned the wilderness almost completely.

Research Natural Areas

Monument Canyon Research Natural Area, about 640 acres, was established in 1933 to preserve in a natural state of typical area of western yellow pine forest found in New Mexico (USDA FS 2002b). Cañada Bonito Proposed Research Natural Area, about 300 acres, is an example of an outstanding high-elevation Thurber fescue (*Festuca thurberi*) community at or very near its climax expression.

Cultural Ecology

The area has been used for thousands of years. Bandelier National Monument includes evidence of a human presence here going back over 11,000 years. Tsi Pin was occupied between 1200 AD and 1325 AD and housed more than one thousand people at a time (USDA FS 2014a).

Families have lived off the land for many generations. Local communities still use the land for cattle and sheep grazing and agricultural needs. The Jemez, Zia, and Jicarilla Apache Pueblos neighbor the Cuba Ranger District and are closely tied to the natural resources of the land for a number of activities and uses (USDA FS 2014b).

The Jemez Mountains are very important to the people of the Jemez Pueblo. The Santa Fe National Forest works with the Pueblo to maintain their cultural landmarks, and to make sure that the management of the land is in accordance with the local community (USDA FS 2014c).

The ecological section description covers an area larger than this scenic character description and includes a section on land use. McNab and Avers (1994c) describe the land use as more than 50 percent as Federally owned. The remainder is in farms, ranches and private holdings. Most of the grassland and much of the open woodland is grazed. Some small valleys are irrigated. Recreation mining, and timber harvest are important land uses.

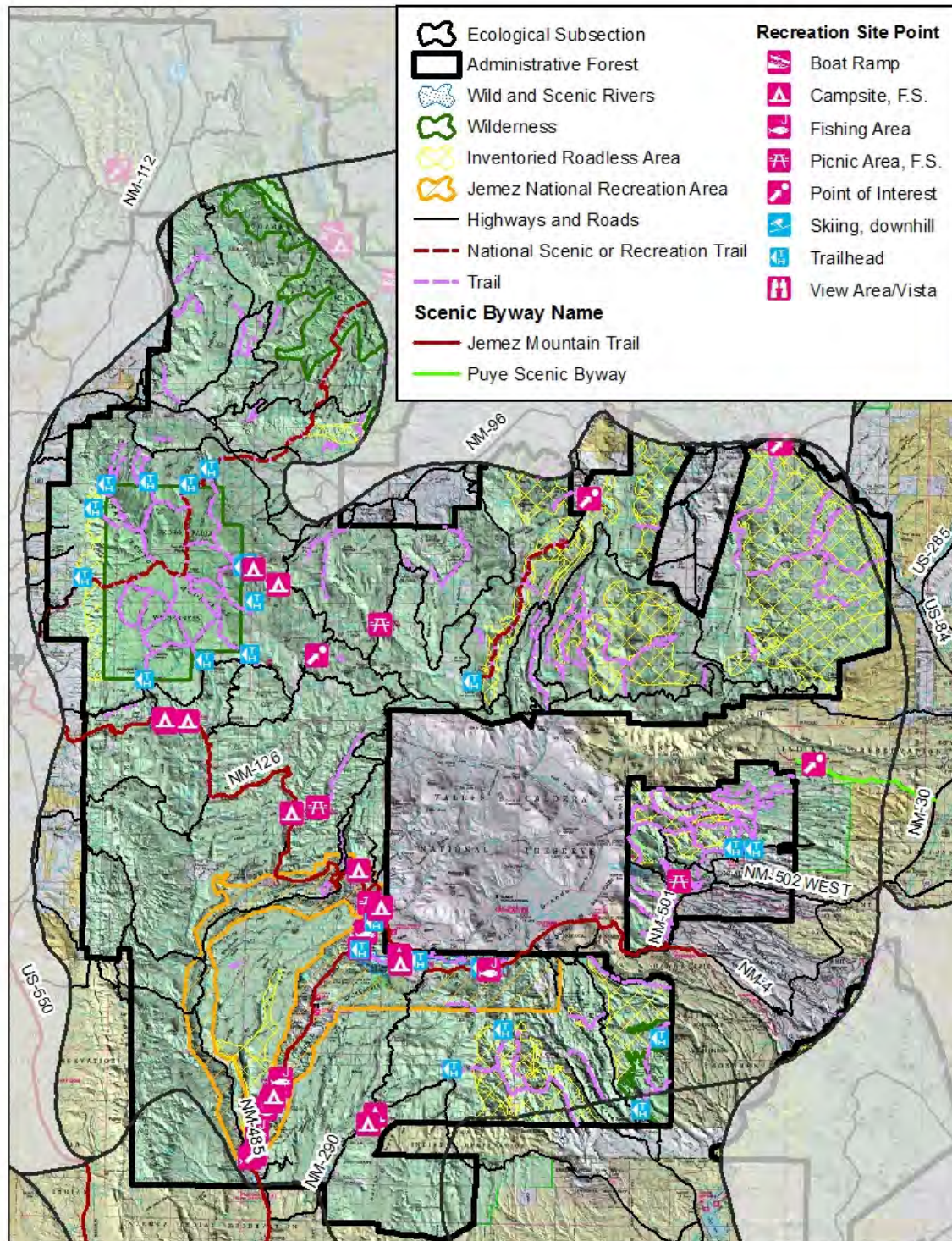


Figure 76. Recreation Opportunities Map for the Jemez and San Pedro Mountains Subsection

Ecological Component

Included in the South-Central Highlands Ecological Section (M331G), this subsection is located in north central New Mexico in the Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest - Alpine Meadow physiographic province. The Jemez and San Pedro

Mountains Ecological Subsection (M331Gm) within the Santa Fe National Forest includes over 30 Terrestrial Ecological Unit (TEU) map units and about 25 GTES map units. The ecological component below is summarized from Ecological Subregions of the United States (McNab and Avers 1994c), Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989), and General Ecosystem Survey for the Southwestern Region (USDA FS 1991).

Dominant Environmental Regimes

Landform/ Geomorphology

The South-Central Highlands ecological section is characterized by steeply sloping to precipitous mountains dissected by many narrow stream valleys with steep gradients. High walled plateaus and steep walled canyons are common. Soils formed in this area are of sandstones, siltstones, shales, and carbonates (McNab and Avers 1994c).

The Landscape Character Types of the National Forests in Arizona and New Mexico (USDA FS 1989) describes this area in detail. The area is characterized by mountains that have for the most part rounded and smoothed crests and sharp V-shaped canyons with steep walls. The area is a maturely dissected plateau with coarse texture (the streams are relatively far apart). The Nacimiento Mountains are flat topped ranges that form the western boundary of the area. A series of impressive hogback ridges stretch nearly 40 miles along the west face of the Nacimiento Mountains. The Jemez Mountains have thick ash falls and tuffs that have weathered to form interesting cliffs and by sedimentary beds that have eroded to expose colorful formations of yellow sandstone and dazzling red beds. The Valle Grande, one of the world's largest calderas is found within the Jemez Mountains in the Valle Caldera National Preserve (USDA FS 1989).

General Ecosystem Survey characterizes the landforms on the Forest as valley plains, elevated plains, hills, hills and mountains, mountains, and escarpments. Major landforms within the Forest include Jemez Mountains, Nacimiento Mountains, San Pedro Mountains, San Miguel Mountains, Valle Grande, Virgin Mesa, numerous mesas, plateaus, and canyons. Cerro Pedernal is a prominent landscape feature, towering at 9,870 feet in the northern portion of the subsection. Detailed soils information can be found in McNab and Avers (1994c). Elevation ranges from 7,545 to 14,110 feet (2,300 to 4,300 meters) (McNab and Avers 1994c).

Table 7: Landforms by General Ecosystem Survey map units for the Jemez and San Pedro Mountains Subsection

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
130	elevated plains
131	hills/mountains
132	hills/mountains, mountains, escarpments
135	elevated plains
137	mountains, escarpments
160	elevated plains
161	hills/mountains
176	elevated plains , hills/mountains
349	hills/mountains, mountains, escarpments
352	hills/mountains, mountains, escarpments
421	hills, elevated plains, escarpments

GES map unit	Landforms summarized from Region 3 GES Manual (USDA FS 1991)
430	elevated plains
434	hills, elevated plains, escarpments
440	valley plains
441	valley plains
448	hills/plains, elevated plains
451	hills/mountains
452	mountains, escarpments
454	elevated plains, hills
455	mountains, escarpments
466	elevated plains, hills/mountains
471	valley plains
501	valley plains
555	mountains
558	valley plains
559	valley plains
572	mountains



Figure 77. San Antonio Creek on the Jemez Ranger District

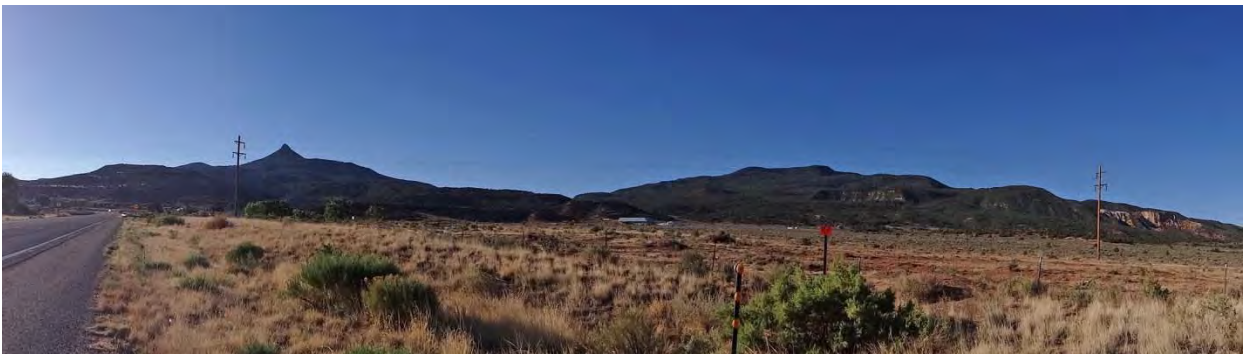


Figure 78. Landscape viewed south of NM Highway 96. Cerro Pedernal is the prominent peak on the left.

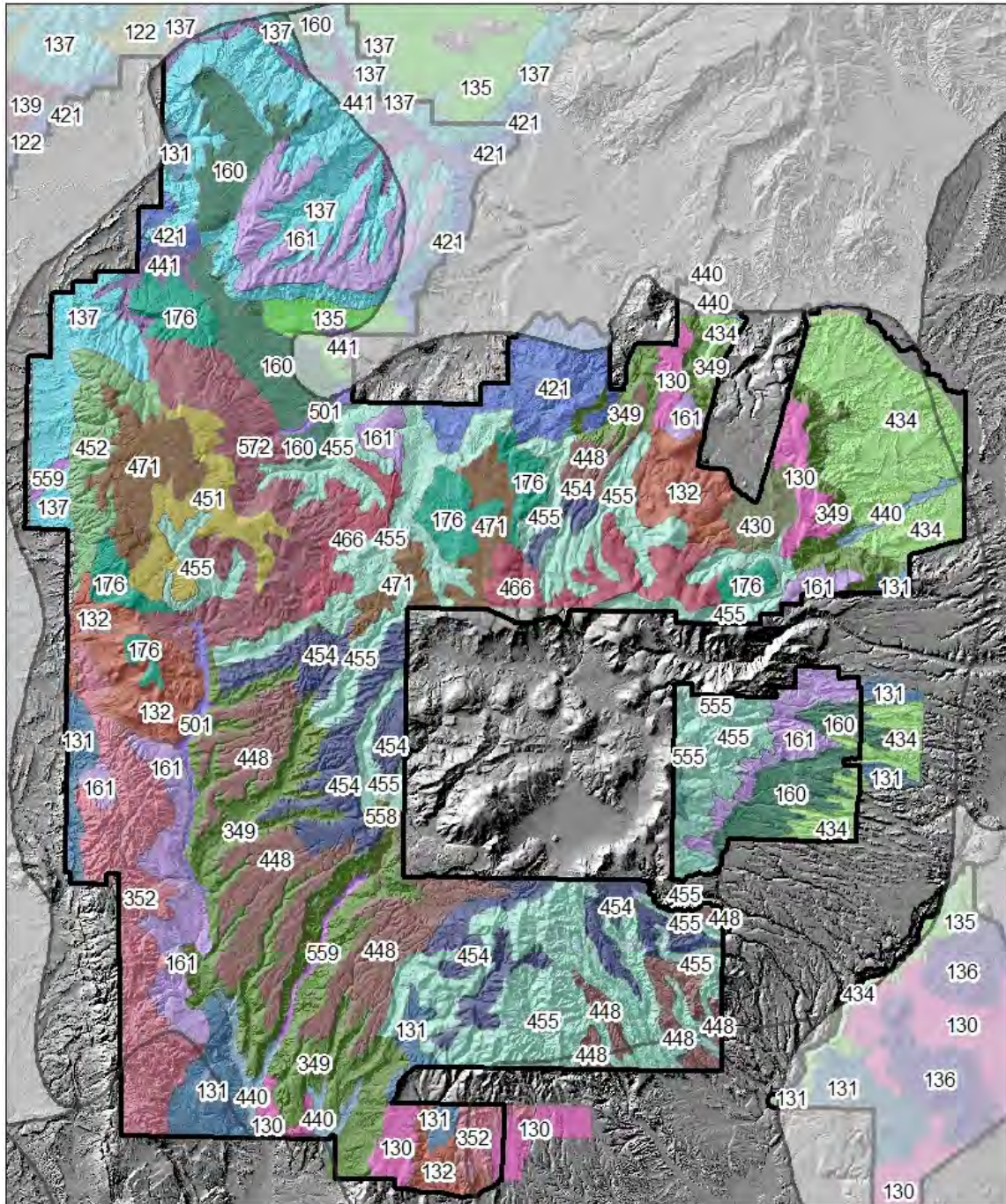


Figure 79. General Ecosystem Survey map units for the Jemez and San Pedro Mountains Subsection

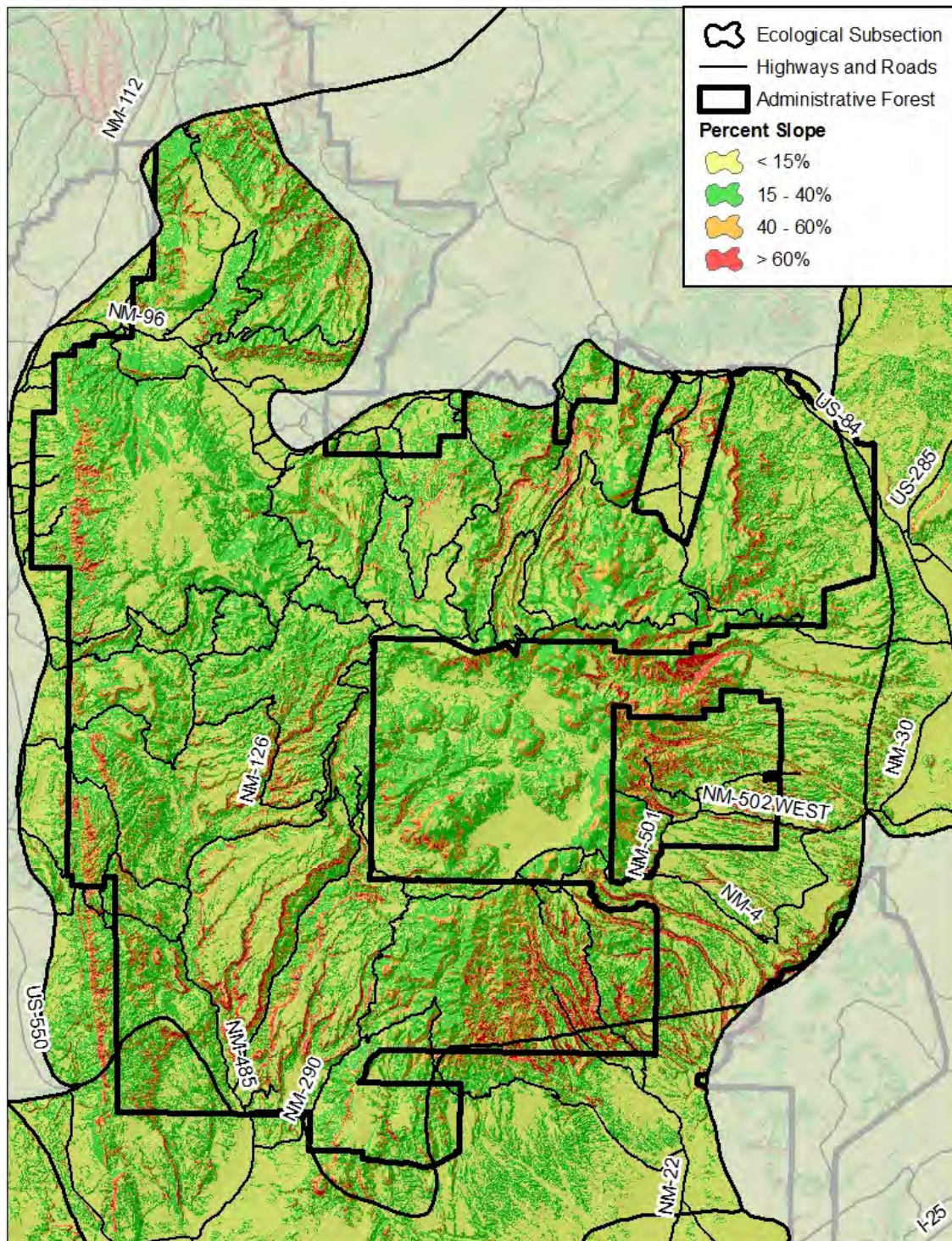


Figure 80. Topography map using percent slope for the Jemez and San Pedro Mountains Subsection

Climate

Precipitation ranges from 15 to 30 inches (370 to 750 millimeters). Temperature averages 32 to 45 °F (0 to 7 °C). The growing season last less than 70 days. (McNab and Avers 1994c).

Surface Water Characteristics

Across the ecological section, water from streams and lakes is abundant, and ground water is plentiful (McNab and Avers 1994c). The area is drained primarily by small perennial watercourses, which are common throughout. The principle water course is the Rio Grande River, which runs along the southeast subsection boundary and Rio Chama along the northeast subsection boundary. The Jemez Mountains area is noted for its hot springs. Fresh meadows, marshes and bogs are common to the area (USDA FS 1989). East Fork Jemez River is a nationally designated wild and scenic river. Intermittent streams are also found throughout, and a few natural or artificial lakes are located within the Forest in this subsection.

Existing Vegetation

The vegetation within NFS lands varies across the subsection depending on elevation, aspect, and soils influencing vegetative patterns. At a broad scale, “coniferous forest is the predominant vegetation in the mountains. Montane conifer generally dominates the lower mountain slopes while subalpine conifer dominates the upper mountain slopes. Pinyon-juniper woodland, plains grassland, and sagebrush dominate the basins. Aspen and mountain meadow grassland are common to parts of the area. Riparian deciduous forest and woodland are common along watercourses” (USDA FS 1989, 43).

The vegetation types at the midscale level are discussed by dominance type. Within the subsection, lower elevations in the northeast portion of the Forest are dominated by juniper and grasslands which transitions to pinyon-juniper as elevation increases. The lower elevations in the southern portion of the Jemez NRA are dominated by big sagebrush, deciduous shrubs, and juniper, also transitioning to pinyon-juniper as elevation increases. Riparian vegetation is common in most drainage bottoms. Large grasslands and meadows are common in the Valle Caldera National Preserve, south of Abiquiu, and Valle de la Grulla. Wet meadows occur throughout the San Pedro Parks Wilderness and western portion of the subsection. A combination of high elevation and abundant moisture result in a beautiful array of color from flowering plants during the summer months in the western portion of the subsection.

Throughout the subsection, pinyon-juniper transitions to ponderosa pine forest mix as elevation increase. The ponderosa pine mix changes to deciduous-evergreen forest mix with more aspen, spruce, and fir mixing with pine types. Aspen dominates many areas along the western portions of the subsection in the Nacimiento and San Pedro Mountains. Young aspen dominates areas burned by large fires in the southeastern and eastern portions of the subsection. The highest elevations along 31 Mile Road (NFSR 144) and in the San Pedro Parks Wilderness are dominated by spruce-fir forests. Wet meadows occur intermixed with spruce-fir forests in the San Pedro Mountains. A figure on the next page depicts the most prominent existing vegetation using midscale vegetation mapping dominance types.



Figure 81. Landforms and vegetative patterns in the San Antonio Creek drainage

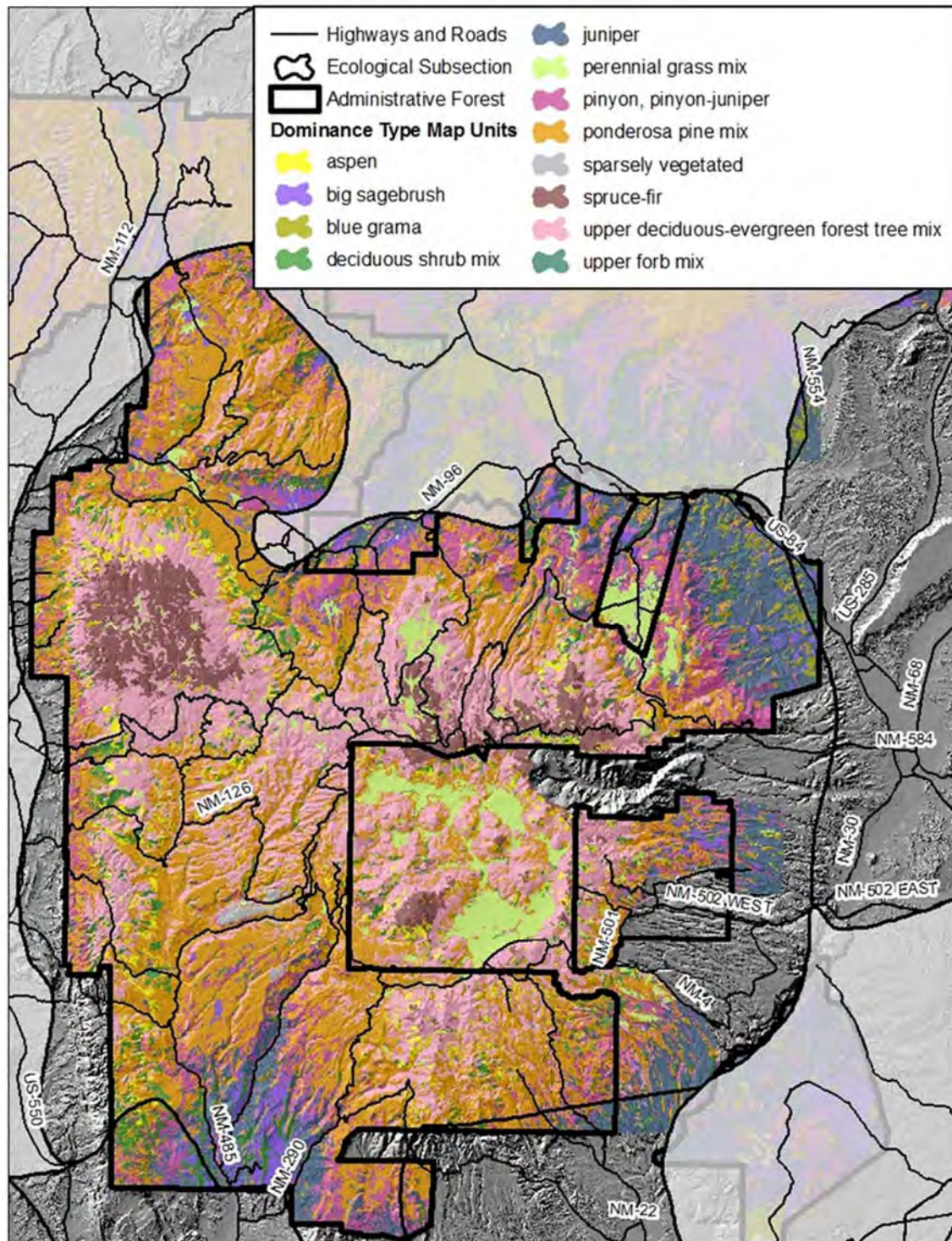


Figure 82. Midscale Vegetation Dominance Types for the Jemez and San Pedro Mountains Subsection

Potential Natural Vegetation

At a broad scale, vegetation ranges from shrub and grasslands, forests, and alpine tundra at the highest elevations. However, alpine tundra does not occur within this ecological subsection. Vegetation is also classified as southwestern spruce--fir forest, pine-Douglas-fir forest, mountain

mahogany--oak scrub, Great Basin sagebrush, juniper-pinyon woodland, and alpine meadows and barren (McNab and Avers 1994c).

Potential Natural Vegetation types are depicted with Terrestrial Ecosystem Survey vegetation types, as shown in the following figure. Several vegetation communities occur on NFS lands within this subsection. Alder, cottonwood, and willow riparian vegetation occurs along perennial stream courses including but not limited to Rio Guadalupe, Jemez River, and streams and wet meadows in the San Pedro Parks Wilderness. Pinyon-juniper dominates lower elevations that transitions to ponderosa pine mix as elevation increases with spruce, fir, pine mix at the highest elevations. Gambel oak and aspen occur within the conifer forests. Sedge and grass mixes dominate large meadows in Valle Caldera National Preserve. Blue grama, fesque, bluegrass mix dominate large meadows in the northern portions of this subsection and is mixed with riparian vegetation types in the meadows in the San Pedro Parks Wilderness.



Figure 83. View landforms and vegetative patterns from NFSR 144 on Espanola Ranger District



Figure 84. View landforms and vegetative patterns from NFSR 144 on Espanola Ranger District



Figure 85. Common ponderosa pine stand viewed from NFSR 103

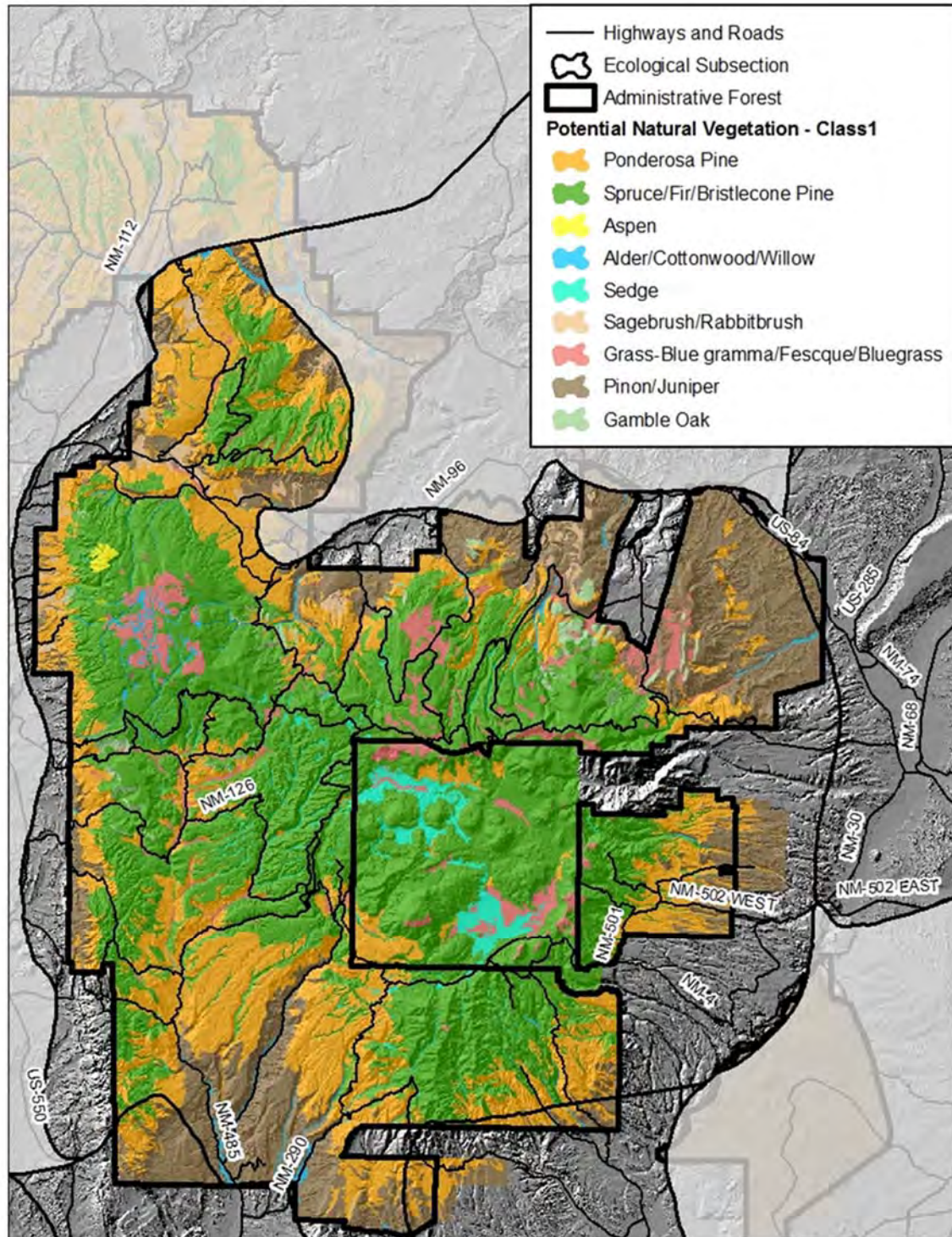


Figure 86. Terrestrial Ecosystem Survey Vegetation Types for the Jemez and San Pedro Mountains Subsection

Disturbance Regimes

Fire, insects, and disease are principal sources of natural disturbance (USDA FS 1994c). Wildfires vary in frequency and intensity within the vegetation type represented in this ecological subsection. Fires also vary in frequency and intensity, depending on fuel load and moisture. In most cases, historic occurrence has changed from frequent, low intensity, ground fires to infrequent, high intensity, stand replacing fires. Uncharacteristic, stand-replacing wildfires pose fire flooding and erosion risk, and insects and disease outbreaks on the Forest. The historic fire regime over much of the area in upper deciduous, spruce fir-pine dominated areas is 35 to 200 year fire return interval with low and mixed severity. Ponderosa pine dominated areas have a fire regime group of less than 35 year fire return interval with low and mix severity. Higher elevations meadows, such as those in San Pedro Parks Wilderness, have a fire regime group of 35 to 200 year fire return interval with replacement severity (LANDFIRE 2014a). The vegetation within this subsection is mostly high and moderate departure with low departure in lowlands from these fire regime groups, depending on the vegetation communities present (LANDFIRE 2014b). Landslides are also common to the mountains in this area (USDA FS 1989).

Most noticeable changes to scenic conditions across the landscape occur through natural processes such as wildfires or flooding. These natural disturbances will continue to shape the vegetation and landform features of the landscape, affecting the overall sustainability of the scenic character. Fire can also benefit scenic character. Historic fires, which result in large areas of aspen, provide beautiful golden fall colors intermixed against green conifer covered mountains. Wildfires which burn with mixed severity have fewer impacts to scenic character than those that burn with high severity, which result in greater tree mortality. Low and mixed severity fires are part of the characteristic landscape.

Some recent uncharacteristic, stand-replacing wildfires have burned through portions of the subsection changing the landscape setting in those areas. The Las Conchas Fire of 2011 burned through over 150,000 acres on the Española and Jemez Ranger Districts, the Valles Caldera National Preserve, and the Bandelier National Monument. This high severity, uncharacteristic wildfire caused widespread tree and vegetation mortality, facility damage, and danger trees and has affected the scenery viewed from Jemez Mountain Scenic Byway, Los Alamos, Pajarito Mountain Ski Area, and many Forest recreation sites and roads. It also caused widespread mortality changing the scenic character from views of conifer forest covered mountains to open shrub and grass covered mountains with standing and fallen dead trees. Widespread post-fire flooding and erosion further altered the scenic character by moving and exposing soils and affecting revegetation and access, since some roads remain closed in the fire area. Areas where the fire burned in a mosaic pattern have a more typical scenic character for the area.



Figure 87. Views of Cochiti Canyon after the Las Conchas Fire, showing widespread tree mortality and remaining standing dead trees. Photos taken in June 2013.

The Cerro Grande Fire of 2000 burned through over 47,000 acres on the Española Ranger District and other ownerships. This high severity, uncharacteristic wildfire caused widespread tree and vegetation mortality, as well as the loss of and damage to homes and structures at Los Alamos National Laboratory. The fire also caused widespread tree mortality on NFS lands changing the scenic character from views of ponderosa pine forests to open shrub, aspen sprout, and grass covered hillsides with standing and fallen dead trees. The Cerro Grande Fire has been slower to revegetate on NFS lands. Shrubs and aspen are beginning to dominate and may provide for some fall color variety in the future as the area recovers.



Figure 88. View of Los Alamos Canyon 13 years after the Cerro Grande Fire, showing revegetation dominated by shrubs. Photo taken in June 2013.

The Thompson Ridge Fire of 2013 burned over 23,000 acres on the Valles Caldera National Preserve causing some vegetation loss. When viewed from the Jemez Mountain Scenic Byway, the fire appears to have burned in a mosaic pattern with mixed severity (Observation from site visit by author, June 2013).

Some of the other fires shaping the landscape setting in this ecological subsection include: 2010 Southfork Fire, 2006 Bear Paw Fire, 2010 Virgin Canyon Fire, 2002 Lakes Fire, 1976 Porter Fire, and 1971 Cebollita Fire. Bear Paw Fire of 2006 burned with stand replacing severity, still dominating views south and east of NM Highway 96, NM Highway 595, and NM Highway 112. A forest covered hillside has been replaced by an open hillside covered in shrubs and grasses with standing, dead trees.

Other natural disturbances include insect and disease risk in upper deciduous and evergreen mix vegetation types with mortality or damage from western spruce budworm, Douglas fir beetle, and western tent caterpillar causing aspen defoliation to name a few. Aspen defoliation can greatly affect scenery since fall colors are a big part of the economy and tourism industries. The primary tree species people travel to look at in New Mexico are aspens, and defoliation can have many different economic and ecologic impacts (NM State Forestry 2012). Pinyon-juniper vegetation types include mortality and damage from pinyon ips.

The Forest continues to feel the effects of drought conditions. Below average precipitation causes increased stress on trees which can make them more susceptible to insect and disease and increase severity and intensity of wildfires. Aspen defoliation is a separate issue from sudden aspen decline (SAD), which appears to be drought related and not driven by insects or diseases.

Recent drought and dry weather may have an impact on aspen health and potentially increase the occurrence of SAD in the state (NM State Forestry 2012). Drought conditions also affect availability of water resources, which are highly sought by recreationists as well as wildlife.

Human Caused Disturbance

Management activities include livestock grazing, vegetation management to improve range condition, wildlife habitat improvement, other vegetation management, prescribed fire activity, communication sites, utilities, mining, travel management, developed recreation and dispersed recreation use including but not limited to camping, hunting, hiking, and motorized use. San Pedro Parks Wilderness, Dome Wilderness, portions of Chama River Canyon Wilderness, and several inventoried roadless areas occur in this subsection. Management activities within these parts of the subsection are not noticeable, leaving the valued scenic character intact or unaltered with only minute if any deviations. The existing scenic character and sense of place is expressed at the highest possible level.

Livestock grazing occurs throughout with noticeable changes to the landscape when looking at grazed and ungrazed grasses, range fences, livestock trails, and water developments. Vegetation management to improve range condition may include prescribed fire, herbicide treatment. These management activities may be noticeable when viewed in the foreground distance zone, but typically do not dominate the landscape. These types of activities occur in an overall naturally appearing landscape with minor deviations when structures or developments are viewed.

Wildlife habitat management occurs scattered throughout the subsection and may include opening rehabilitation, precommercial thinning, water developments, and structural improvements.

Various vegetation management activities and fuels reduction activities occur throughout the subsection with regeneration, intermediate and selective harvest types with both commercial and pre-commercial components. Regeneration harvest types can sometimes dominate the landscape depending on shape and concentration of harvest units and concentration of roads. The landscape appears slightly altered from these activities in this subsection. Most intermediate and selective harvest prescriptions are not noticed by forest visitors once slash disposal has occurred and skid trails are revegetated. Fuels reduction and pre-commercial vegetation treatments are often not noticeable once slash disposal has occurred or lop and scatter slash begins to blend with the surrounding vegetation.

The effects of prescribed fire on the landscape are naturally appearing since fire edges typically follow natural vegetative patterns and terrain features. The effects of prescribed fire typically go unnoticed by forest visitors after a few years, depending on project objectives and amount of moisture received.



Figure 89. Hazard tree removal associated with Las Conchas Fire along St. Peters Dome Road (NFSR 289)



Figure 90. Stumps remaining from past timber harvest, an example of low existing scenic integrity



Figure 91. Another view of stumps remaining from past timber harvest, an example of low existing scenic integrity

Communication sites, utilities, and mining and gravel pits are the most noticeable alterations in this landscape when they are viewed. Communication sites with multiple towers may dominate a view due to the strong linear features added to the landscape above a shrub or tree canopy and landform features and vegetative clearing for facilities.

Major power or utility lines are located throughout the subsection. Major utility corridors often dominate the landscape when viewed either with large vertical structures or vegetative clearing making the landscape appear heavily altered. Where vegetative clearing is not needed or minimized, these activities result a landscape which generally appears moderately altered.

Mining and gravel or borrow pits occur throughout the subsection, including Nacimiento Mine on the western boundary of the Forest. Nacimiento Mine is visible from the surrounding low elevation landscape, as well as from NM Highway 550, and Cuba, NM. The Nacimiento Mine area appears heavily altered with the management activity dominating the characteristic landscape. The San Miguel mine also occurs within this subsection; however, the most noticeable activities occur on private lands. The activities associated with this mine occurring on NFS lands moderately alter the landscape. Other mining, gravel pits, and borrow pits tend to heavily alter the landform component of the landscape and expose noticeably different colored rock and soils. The form and color of the landscape often appears heavily altered by these activities.

Within this subsection, most roads present within the area are suitable for high clearance vehicles only. Roads more easily traveled, suitable for passenger cars, provide access throughout the subsection and include: US Highways and State Highways 4, 96, 126, 501, 502 County Roads, and main NFS roads. Some of the main NFS roads providing access include: Ponderosa Road (NFSR 10), Trail Creek Road (NFSR 20), Dome Road (NFSR 289), 31 mile Road (NFSR 144), Coyote Canyon Road (NFSR 316), Encino Road (NFSR 100), Abiquiu Road (NFSR 31), and Capulin Road (NFSR 76). These roads, secondary roads, motorized trails, and non-motorized trails are the primary access and platform for viewing scenery and may occur in otherwise naturally appearing landscapes.

Most road surfaces within the campgrounds and picnic areas along NM Highway 4 are paved. Campgrounds and picnic areas located away from main recreation corridors tend to have gravel, native or dirt surfaced roads. Generally, these recreation activities do not dominate the landscape, borrowing colors, materials, and scale from surrounding landscape features and appear slightly altered.

Dispersed recreation, primarily in the forms of dispersed camping, hunting, hiking, and motorized use occur across the area. The landscape appears unaltered from these activities.



Figure 92. Jemez Falls Trailhead and day use site

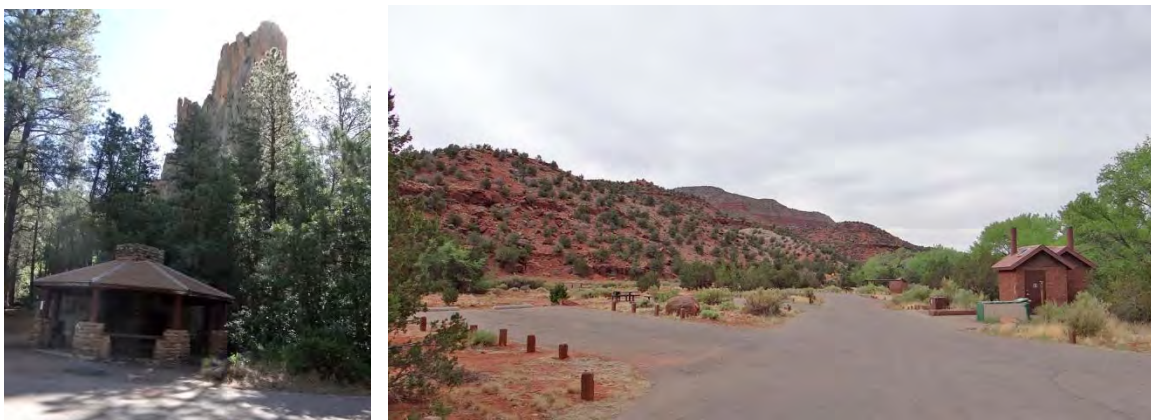


Figure 93. Battleship Rock Picnic Area and picnic shelter (on the left) and Vista Linda Campground (on the right)

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Data sources for maps and ecological components

Recreation Resource Maps: feature classes from Santa Fe SDE geodatabase and T drive Santa Fe Reference Data.

General Ecosystem Survey: Region 3 SDE geodatabase, Feature Dataset:
Gen_Terre_Ecosystem_Survey, Feature Class: GTES

Slope: raster created from 10m Digital Elevation Model, resampled to 30 meters and percent slope determined through Surface Analyst

Existing vegetation: Feature Dataset: Midscale_Existing_Veg, Feature Class:
dominance_type_map_units (attribute field DT_MU_DESC)

Potential Natural Vegetation: Layer file TEU_PotentialNatVeg_AggMapUnitRSW.lyr

Disturbance Regimes:

Vegetation Condition Class: us_110vcc (refresh 2008 download)

Fire Regime Group: us_110frg (refresh 2008 download)

Fire History: SDE geodatabase, Feature Dataset: Fire_Management, Feature Class:
Fire_History_pl

Insects and Disease: Santa_Fe_ADS_1998_2012.mdb, Feature Dataset:
Damage_Derived, Feature Class: SantaFe_Merged_1998_2012