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The Jemez National Recreation Area Assessment Report

This Assessment Report is a first step in developing a management plan for the Jemez National Recreation Area (JNRA). The next step will be to complete an environmental analysis process (this would include either an Environmental Assessment - EA, or an Environmental Impact Statement -EIS), with additional public participation, to identify and evaluate a range of management plan alternatives for the JNRA.

This document describes the prominent natural resource and social conditions affecting the JNRA. After each section of existing condition descriptions is a shaded box containing a list of "Goals, Standards, and Guidelines", which are strategies the agency can use to address the specific existing conditions described. These Goals, Standards and Guidelines will be the foundation for developing the JNRA management plan, which will eventually be incorporated into the Forest Plan.

Following each box of "Goals, Standards, and Guidelines", is an italicized listing of *possible actions* that address the "Goals, Standards, and Guidelines", and may be proposed some time in the future. The *possible actions* are not all inclusive, and are not part of the decision to be made in the JNRA management plan. The JNRA management plan will emphasize broad, programmatic direction about how the area should be managed. Decisions to approve site-specific actions would be made under separate project analyses.

Information contained in this document was gathered from a series of public workshops that were held from May through September 1997, along with written comments received from the public and other agencies, and contributions from resource specialists on the Santa Fe National Forest (see list of Interdisciplinary Team members at the end of this report). Public involvement will continue throughout the next planning phase.

Information contained in this report is not static or final. Corrections and updates may be submitted by anyone at any time, to continuously improve this area assessment.

Jemez National Recreation Area Purpose of Establishment

The Jemez National Recreation Area was established by the United States Congress on October 12, 1993, to conserve, protect, and restore the recreational, ecological, cultural, religious, and wildlife resource values of the Jemez Mountains. Lands within the proposed boundary total approximately 57,650 acres. About 9,350 acres within the boundary are under private ownership, the remaining portion (48,300 acres) is on National Forest System Lands.

Management of the natural resources within the JNRA is permitted only to the extent that such management does not impair the purposes for which the JNRA was established. Recreation activities that are specifically permitted include hiking, camping, hunting, fishing, skiing, backpacking, rock climbing and swimming. Timber harvesting, livestock grazing and mining on valid locatable minerals claims are specifically recognized in the JNRA Act as permitted activities. The Act clearly addresses the issue of land acquisition and it should be noted that the Forest Service has no plans to condemn any private land within or adjacent to the JNRA. A copy of the Act is provided in Appendix A.

The Jemez National Recreation Area and the Forest Plan

Situated in the northcentral portion of New Mexico, the JNRA is located on the Jemez Ranger District of the Santa Fe National Forest (Maps 1 and 2). The JNRA is accessed by State Highway 4, a State Scenic and Historic Byway, and State Highway 126. The western boundary of the recreation area includes the Rio Guadalupe corridor. The southeastern portion consists of the Jemez River corridor and San Diego Canyon.

It is estimated that nearly 1.6 million people currently pass through the JNRA each year on Highways 4 and 126. These visitors come specifically to enjoy the Jemez Mountains, and often stop at one of the many developed or undeveloped recreation sites in the area.

The management direction that applies to the JNRA currently comes from both the JNRA Act as well as

the Santa Fe National Forest Plan. There are several different management areas established in the Forest Plan within or overlapping portions of the JNRA. However, when the Management Plan for the JNRA is approved, the Forest Plan will be amended to replace existing management areas in the JNRA with a new JNRA management area, and to incorporate any changes in management area direction.

Portions of management areas A, C, E, G, L, M, N, P, Q, and R all fall within the JNRA. Management Area A (less than 1% of JNRA) emphasizes timber production and enhancement of wildlife habitat diversity. Management Area C (61% of JNRA) emphasizes the enhancement of visual quality and developed recreation while protecting essential wildlife habitat and riparian zones. Management Area E (1% of JNRA) emphasizes providing dispersed recreation opportunities, maintaining visual qualities and timber and firewood production. Management Area G (1% of JNRA) consists primarily of low elevation grasslands where emphasis is on key wildlife habitat protection, habitat improvement, and forage and firewood production. Management Area L (5% of JNRA) offers outstanding opportunities for dispersed recreation with emphasis on providing semi-primitive, non-motorized recreation opportunities. Management Area M (1% of JNRA) is a designated Research Natural Area, managed to provide opportunities for research and education. Management Area N (8% of JNRA) emphasizes protecting and enhancing habitat for threatened and endangered species. Management areas P, Q, and R (4%, 3%, and 15% respectively) emphasize cultural resource location, inventory, nomination, and protection, with additional emphasis on timber production, recreation, and wildlife habitat improvement and diversity. Present along the northeast portion of the JNRA is the 3,520 acre congressionally designated *East Fork of the Jemez Wild and Scenic River*.

Geology, Topography, and Climate

Geology and Topography

The geology of the Jemez Mountains provides a variety of dramatic landforms with breathtaking views and vibrant colors. From sheer cliff faces to pock-marked tuff exposures; flat-topped mesas to lush canyon bottoms; the wide expanse of the Valle Grande to the domed peak of Redondo. This extraordinary landscape was created by eons of gradual and cataclysmic geologic events.

Three hundred million years ago, a shallow sea covered much of New Mexico. The weight of hundreds of feet of sea bed sediments formed the fossil rich Madera Limestone. The limestone can be seen above Jemez Ranger Station just north of the Town of Jemez Springs as a greyish or yellow horizontally layered formation. Just above it is the striking, red Abo Sandstone formation which is particularly evident along State Highway 4 and the Jemez River in San Diego Canyon.

Gradual extensional forces in the earth's crust over the last 29 million years was responsible for a tear or rift extending from Leadville, Colorado to El Paso, Texas. The Rio Grande river filled the 450 mile-long rift with sediments more than 8,000 feet deep. The earth's crust is thinner along the rift. Molten rock, called magma, rose to the surface creating a chain of volcanos from Colorado to Socorro, New Mexico. Around 13 million years ago, rising magma on the western edge of the rift (between the Sangre de Cristo Mountains and the Nacimiento Uplands) began a period of volcanic activity which continued to as recently as 65 thousand years ago. The final accumulation of volcanic material would measure 1,000 square miles in size and some 5,000 feet deep.

More volcanic eruptions began 1.3 million years ago with fifty cubic miles of pyroclastic ash pouring down the mountain slopes (in comparison, the Mount St. Helen's eruption of 1980 produced only three cubic miles of ash). The ejection of ash caused the roof of the volcano to collapse forming the Toledo crater in what is now the headwaters of the Santa Clara Creek.

As the 1,000 degree Fahrenheit ash slowly cooled, glass particles welded together to form the lower level of the Bandelier tuff. The degree of welding resulted in cliffs varying from very hard to soft tuff. The harder material forms vertical cliffs. Moderately

welded material is softer and is often "pock" marked from wind erosion or breaks down to form benches or ledges. Slightly welded tuff can be sculpted by water and wind into conical shaped "tent rocks". Cataclysmic eruptions again rocked the area 1.1 million years ago. This time, volcanic rock was thrown as far as Nebraska, Kansas and Oklahoma and ash blanketed much of the Midwest. Another fifty cubic miles of pyroclastic ash was ejected. The hot ash-flows traveled at more than 100 miles per hour and buried most of the older caldera as well as inundated a 400 square mile area up to 1,000 feet deep. More than 200,000 acres of forest were buried. The ash welded together to form the upper Bandelier tuff which was responsible for the formation of the spectacular mesa tops and plateaus of the Jemez Mountains.

Again, ejection of magma caused the volcano to collapse inward and subside, forming the 15 mile diameter 1,000 foot deep Valles caldera in the center of the Jemez Mountains. Later, snow melt filled the caldera with water creating a large lake in the valley floor. Over the next 100,000 years, the magma pushed up the center of the caldera (valley) floor, forming the 11,254 ft. Redondo peak. A dozen or so smaller volcanic domes formed around the three mile wide "moat" of the caldera.

Doming eventually raised the lake level causing a three mile wide breach on the caldera's southwest side. The resulting rush of flood waters is believed to have carved out the spectacular San Diego Canyon. Other breaches may have been responsible for carving San Antonio Creek, the East Fork of the Jemez River and Santa Clara Creek. These creeks and rivers continue to erode the rim of the volcano and drain the caldera. The old lake beds form the extremely flat bottomed valleys of the caldera, called "Valles". Perhaps the most well know valle is the Valles Grande, visible to travellers along State Highway 4.

Around 85,000 years ago the volcano again roared to life. This recent event produced Battleship Rock, a remnant of the small pyroclastic flows which were produced. During this eruption, pumice was ejected 15 miles into the atmosphere, blanketing 13,000 acres of the East Fork of the Jemez River and areas surrounding Los Griegos, Las Conchas and Cerro Pelado Peaks. Obsidian glass formed the Banco Bonito, "glass flow". The Dark Canyon area

between Spence Hot Springs and La Cueva Picnic ground marks the western edge of this glassy flow.

Hot springs throughout the Jemez Mountains, as well as the existence of steam and gas seeps still exist under the Jemez volcanic pile. Although eruptive sequences tend to be tens and hundreds of thousands of years apart and are not expected to occur in the near future, the Jemez Mountains will likely be further affected by future volcanic activity.

Climate

From a warm windy spring to a hot summer with welcomed cool rains; a crisp colorful fall to a snowy peaceful winter, one can expect to enjoy all four seasons in the Jemez Mountains.

Temperatures generally increase quickly in the spring months, slowly peak in July, and then drop very quickly during late summer. Although extremes may reach 106 degrees Fahrenheit, summer temperatures usually range between 50 and 90 degrees F. Winter lows can be below zero but on sunny days the area will warm to about 40 degrees F.

The average annual precipitation is 20 inches with over 50 percent of the annual precipitation being received in the form of summer rains. These rains are locally called the summer "monsoons" and result in increased humidity and thunder storms. Rainfall is usually localized with a high intensity and short duration. A cool, dry fall usually follows the "monsoon" season. In winter, snows are common from December through February. March and April are considered the windy months marked with occasional wide spread rain storms. May and June represent the warm dry period in the Jemez area.

Wind patterns are primarily effected by seasonal temperature and pressure changes. In the winter, winds occur out of the northwest, west, and southwest. Summer winds are predominately from the southwest. Overall, as stated above, spring is the windiest season.

Soil, Water, Riparian, and Air

Soil

Soils are important because they provide a medium for plant growth. The vegetation then provides a sheltering ground cover which discourages erosion and allows soils to form. The soils of the JNRA are diverse and are described in more detail in the terrestrial ecosystem survey of the Santa Fe National Forest (1991). The following section discusses how soils form and what activities contribute to soil erosion.

Soil development is influenced by time, climate, organic materials, relief, and parent material. In the JNRA, a variety of micro climates are present and vary from wet riparian areas to dry mesa tops. Vegetation growth in these areas provides the organic materials needed for soil formation while the slope and topography influence the ability for the soil to establish itself. Finally, soil formation relies on parent material, which in the JNRA is comprised primarily of volcanic (igneous rock), as well as sedimentary and metamorphic rocks.

The condition of a soil becomes a concern when erosion exceeds the amount of sediment and organics being deposited. This often occurs in areas where slopes are steep and where vegetation only partially covers the ground. Within the JNRA, soil erosion, compaction, and reductions in soil productivity are occurring in some localized areas while increased sedimentation is occurring in other places. To address these concerns, the Forest Service uses a set of practices to reduce impacts of actions to the soil, water, and air resources, these are referred to as Best Management Practices (BMP's). The following are some conditions and activities that have the potential to affect soils in the JNRA.

High intensity fires, especially those located on steep slopes have the potential to cause undesirable soil loss. This is due to the lack of vegetation present to stabilize the slopes. Often, after a successful growing season, vegetation returns and the erosion is stabilized. In situations where a fire burns at an extremely high intensity, the soil can be permanently damaged and vegetation cannot effectively grow back. These situations are becoming more common in the southwest, where naturally occurring fire has been suppressed for a number of years. While there have been no recent high intensity forest fires within

the JNRA, there are areas where the potential for damaging fires is present.

Timber sales and mining activities also have the potential to impact soils. Timber sales involve the cutting and removal of timber. The removal often accounts for the majority of ground disturbance. Two timber sales are currently being conducted within the JNRA. Soil issues have been addressed in the planning for both of these sales. While some localized soil disturbance will occur, ultimately, the removal of timber will thin stands and reduce the threat of high intensity wildfires as discussed previously. Timber removal also allows for an increase in grasses and low growing vegetation which can provide effective ground cover.

Pumice mining in the JNRA is a controversial issue. The removal of pumice involves clearing off and stock piling the top soil to access the pumice material. Soil issues are addressed in the planning of all mining projects and there are strict requirements related to re-establishing soil productivity as well as the natural contours of the land.

One of the most common factors affecting soils is trampling which causes soil compaction. Some compaction can be attributed to grazing by wildlife and livestock. Recreation activities are also a leading cause of soil compaction. In the JNRA, the biggest problems with soil compaction are within the riparian areas (along rivers and near springs).

In the JNRA, areas at high elevations (above the piñon-juniper zone) usually have enough ground cover to protect the soils. Down slope erosion and sediment deposition into streams is usually minimal in these areas. In the Lower Jemez and Lower Guadalupe Canyon, erosion is more common due to steep canyon slopes and a low amount of ground cover. It is estimated that about 11,367 acres of the JNRA are located on steep slopes with sparse ground cover and are at a higher risk to erosion. An additional 429 acres of soil located in the piñon-juniper zone is also at a higher risk to erosion due to lack of sufficient ground cover.

Water and Riparian

Two main drainages, the Rio Guadalupe and the Jemez River, are located within the JNRA. These

rivers drain the south side of the Jemez Mountains. They have both been designated by the State for primary use as high quality coldwater fisheries, irrigation sources, and for livestock and wildlife habitat. A portion of the Rio Guadalupe system has also been designated for domestic water supply. Riparian areas are located along these same water courses and in the vicinity of springs. Riparian areas are characterized by distinctive soil types, vegetation, and hydrologic conditions. These areas provide biologically diverse and productive ecosystems. In the southwest (New Mexico and Arizona), riparian areas account for less than 2% of the land, yet over 65% of southwestern animals depend on riparian habitats for their livelihood.

While riparian areas are of great importance to plant and animal species, they are also a primary draw for both cattle and recreation users in the southwest.

Historically, the JNRA area was heavily grazed. Today, the area is managed differently and grazing is at much lower levels. Still, there are localized problems associated with cattle accessing water sources which results in soil compaction. These problems are being addressed by establishing more upland water sources. A water sample taken in 1991 from the East Fork of the Jemez River exceeded State standards for unionized ammonia and total phosphate. This might indicate a problem with livestock/wildlife fecal matter, recreational use, or nearby dwellings. Additional water testing would need to be conducted before a determination could be made on what activities are causing the water quality standards to be exceeded.

Dispersed recreation use is common in riparian areas throughout the southwest and many riparian areas in the JNRA are currently being impacted through recreation use. Visitors tend to want to camp near water sources which results in trampling, soil compaction, vegetation loss, and increased sedimentation being deposited into the streams. This damage is most common along the Rio Guadalupe and East Fork of the Jemez River. These areas exhibit a maze of off road parking, two track roads, and undeveloped pedestrian and OHV trails related to dispersed recreational use.

In the JNRA, the introduction of non-native species in riparian areas has become a concern especially along the Lower Jemez River and the Rio Guadalupe.

These species include salt cedar, Chinese elm, and Russian olive. Non-native species are undesirable for several reasons. Once introduced, they tend to out compete native plants and quickly take over an area. Loss of native vegetation can have devastating effects on wildlife species dependent upon specific plants. The non-native species also alter the effects of fire on riparian areas as they tend to burn at higher intensities.

While riparian areas in the JNRA are generally in good "properly functioning" condition, based on stream survey data combined with ocular estimates by Forest Service resource specialists, the areas are fragile and need to be protected. Compaction resulting from vehicular, pedestrian, and grazing use in riparian areas is resulting in serious localized impacts that need to be addressed.

GOALS, STANDARDS, AND GUIDELINES

Where extensive wildfires occur, take action to assess the degree of resource damage and threat to on and off site values. Identify corrective actions that may be required to protect site productivity from excessive erosion, water quality and timing of flows, and life and property.

Employ Best Management Practices (BMP's) to mitigate actions such as skidding logs, conducting prescribed burns, and conducting road construction/reconstruction activities in upland and riparian zones.

Identify areas that have high erosion rates, due to heavy recreation use, cattle use, road or off-road vehicle use, mining, or other causes, and mitigate to the extent possible in order to meet soil productivity standards.

Identify roads contributing to excessive soil erosion or stream sedimentation and take actions to avoid or minimize impacts.

Prioritize restoration treatment in areas where soil erosion is impacting riparian or water resource values.

Gather sufficient water samples to adequately measure and determine if there is a problem in

meeting State water quality standards. Examine conditions on the Jemez river and tributaries to clarify the cause of reported water pollution problems.

GOALS, STANDARDS, AND GUIDELINES
(continued)

Take corrective action wherever water quality standards are not met due to activities or uses on National Forest Lands in the JNRA.

Ensure that riparian areas continue to meet proper functioning conditions (*Riparian Area Management - Process for Assessing Proper Functioning Condition, USDI - BLM, Technical Reference 1737-9, 1993; revised 1995*). Maintain healthy riparian plant communities.

Reduce cattle impacts within riparian areas.

Reduce human disturbance and recreation impacts to riparian areas. Enhance riparian communities and protect the wet meadows along the Rio Cebolla.

Control and manage sediment being deposited into the East Fork of the Jemez River.

Identify steep slopes, riparian, and other sensitive areas where OHVs should be limited or prohibited.

Control and minimize the presence of non-native species in riparian areas.

Possible Actions

Soil erosion may be reduced by increasing effective ground cover and controlled by installing mechanical measures such as log dams, straw bales, or silt catchment fences in highly erosive areas. Contour felling and seeding activities may also curtail erosion.

Cattle and wildlife impacts on riparian areas may be reduced by providing additional upland water sources for wildlife and cattle. Fencing sensitive riparian areas and limiting the time and amount of grazing that occurs in riparian zone may also be used to reduce impacts.

Recreation impacts on riparian areas may be reduced in localized areas by designating where people can

recreate and park. Installing buck and pole fences, vegetative barriers, or designating administrative closures are also methods that may be used to help prevent recreational impacts to sensitive riparian areas.

Sediment deposition into the East Fork of the Jemez River may be reduced by providing hardened trails and by closing and obliterating non-system roads and trails.

Riparian health may be enhanced by focussing efforts on the health of the riparian plant community. Projects centered around the removal of invasive plants such as Russian olive, Chinese elm, and salt cedar may aid in restoring riparian health.

OHV use may be restricted on selected steep slopes and in sensitive riparian areas through administrative and mechanical closures.

Air

The air-shed over the JNRA is part of the greater air-shed known as the Middle Rio Grande Basin. The JNRA is within Sandoval County, a county that is in attainment with State air quality standards. Activities which may effect air quality are regulated by the State of New Mexico Environmental Department (NMED), and the Federal Government through the Clean Air Act. Ambient Air Quality Standards are noted in the Clean Air Act (CAA) and specified in the New Mexico State Implementation Plan (SIP). The Forest Service and the State of New Mexico have agreed to allow the Forest Service to perform certain activities such as prescribed burning by following guidelines outlined in a Memorandum of Understanding between the two agencies.

There are no Class I air-sheds (areas where air quality is held to a higher standard for aesthetic reasons such as designated wildernesses, or health reasons such as hospitals) within or adjacent to the JNRA. However, the San Pedro Parks Wilderness is located 17 miles to the northwest, the Pecos Wilderness is located 34 miles to the east, and the Bandelier Wilderness is located about 11 miles to the southeast. These areas could potentially be affected by actions within the JNRA. Also, communities, schools, and visitors receive careful consideration

when the Forest Service plans activities which may impact the air quality in or around the JNRA.

Air Quality is physically measured and or modelled to assess potential impacts from planned actions. Currently, the air quality within the JNRA is within the standards set by the SIP. Air quality is also evaluated subjectively each time we look into the sky and take a deep breath. Usually the air quality in the JNRA is outstanding, the sky is a deep blue, and the breeze smells of pine and juniper. Prescribed burns conducted in the spring and fall within or near the JNRA can affect the air quality for several days. Wood smoke can also affect air quality in the JNRA for short periods of time, especially in the winter when wood burning stoves and fireplaces are used. Prescribed burning and wood smoke sometimes create a haze in the valleys. But, wildfires create the greatest impact to air quality as the smoke usually lingers in the air for much longer durations compared to prescribed burns. The recent Dome fire produced hundreds of tons of smoke in the air daily while it consumed over 16,000 acres of forest.

land owners, taking out ads in newspapers, and informing the media of proposed projects.

Prescribed burn areas may be modified and the time of burning may be adjusted to further reduce the impacts of smoke.

GOALS, STANDARDS, AND GUIDELINES

Continue to obtain a permit from New Mexico Environmental Department (NMED) air quality bureau prior to igniting prescribed burns or allowing unplanned ignitions to burn.

Work with the other agencies, Pueblos and local communities to minimize the impacts to air quality while using prescribed fire.

Continue to use standard precautions to minimize smoke impacts as much as possible.

Where appropriate, utilize methods other than prescribed fire to reduce fuels.

Possible Actions

Smoke impacts may be measured by installing weather monitoring stations and smoke particulate monitoring equipment.

The public may be notified of smoke impacts by posting signs in key locations, sending letters to local

Mining

Mining is an activity that has long been conducted on lands within and surrounding the JNRA. Early mining concentrated on the removal of precious metals with gold and silver being extracted in the Albemarle, Cochiti, and Bland area (east of the JNRA) and copper at the Spanish Queen mine (within the JNRA). These mines are no longer in operation.

Today, the emphasis on mining has shifted from precious metals to pumice. Pumice, an igneous rock described as light weight and porous with the same chemical make-up as rhyolite, is an important commodity in today's clothing and building industry. Pumice mining, unlike mining for other minerals, does not require the use of on site chemicals in the extraction process.

Pumice mining is a controversial issue for the local community. Concerns have been expressed about the general environmentally disruptive nature of mining including the loss of soil and vegetation. An increase in noise resulting from extraction and hauling and the loss of scenic values is considered undesirable. Activities associated with mining, namely, hauling material to the processing plant is a major concern to residents. Once mined, the pumice is hauled out of the area along Forest Roads and State Highway 4. There are narrow, winding portions of Highway 4 where visibility is poor and maneuvering large trucks may be dangerous. The public is concerned that this poses a threat to the safety of residents, travelers, and recreationists who use these roads to access the area.

Mining and the JNRA

When the JNRA was created, many believed the passage of the Act would end mining within the National Recreation Area. So why is mining still allowed and why is a new mine (El Cajete) currently being planned?

The Act did not eliminate mining from the JNRA but it did make some very specific changes regarding the type of mining that could occur in the area. Under the Act:

- Mining in the JNRA for common construction or fill materials would no longer be allowed,
- No lands would be leased for oil and gas exploration or for geothermal development, and

- No new mining claims could be staked within the area.

It must be noted however, that while the act prohibits staking new mining claims, it does permit mining *subject to valid and existing rights*. Under mining law, this statement means that mining can occur within the JNRA on existing, *valid*, mining claims which were staked before the passage of the Act.

Here, validity is an important issue. In the past, mining claims were assumed to be valid unless challenged and often, mining occurred on claims where the validity was never challenged. The Act required that all existing mining claims within the JNRA be examined to determine validity prior to allowing mining activities.

In accordance with the Act, the Forest Service began the lengthy process of determining validity on the mining claims within the JNRA (Map 3). Forest Service mineral examinations of 23 claims to date has determined that only four and one-half claims are valid. The Bureau of Land Management (BLM) has concurred with the Forest Service determination and on January 9, 1997, issued a complaint contesting the validity of 18.5 claims. The claimants maintain that all of their claims are valid and the matter is currently before the Office of Hearings and Appeals for resolution.

Existing and Proposed Mines

When the JNRA Act was passed, the Las Conchas pumice mine was in its final phase of mining and the a proposal had been received for the El Cajete pumice mine.

The Las Conchas mine was operating on unexamined mining claims, removing pumice for common construction purpose and for use in stone washing. The courts determined that pumice occurring in fragments 3/4 inch and larger was considered locatable. Pumice fragments smaller than 3/4 inch were considered common variety.

With the passage of the Act, the mine operator was limited to mining locatable (larger than 3/4 inch) pumice. The only common variety pumice removed was that which had already been contracted and paid for. The last common variety pumice was removed from the mine by December 31st of 1993.

The Las Conchas mine closed in 1996. The west end of the mine had been reclaimed in 1993 and is now successfully stabilized and revegetated. The remainder of the mine was reshaped and seeded in the fall of 1996 and planted with tree saplings in the spring of 1997. The 1996-1997 reclamation work is expected to be successful and will be monitored annually for effectiveness. After three full growing seasons, the reclamation will be evaluated. If the vegetation recovery is not satisfactory, monitoring will continue for additional seasons until the vegetation meets the agreed upon criteria.

The proposed El Cajete mine is located on claims which were determined to be valid. As part of the planning efforts, an Environmental Impact Statement (EIS) was written to disclose the effects of the proposed mine on the environment. In December 1996, the Forest Service issued a Record of Decision which would permit mining at El Cajete, pending the approval of a plan of operation. The Plan of Operation was accepted and approved by the Forest Service on November 18, 1997.

Reclamation

The Act notes that mining must "include requirements for reasonable reclamation of disturbed lands to a visual and hydrological condition as close as practical to their premining condition." The selected alternative in the final EIS for the proposed El Cajete mine was developed to describe how the mine could be planned, implemented, and reclaimed in order to meet the intent of the Act. The Plan of Operation for the El Cajete Mine considered visual impacts by making use of concurrent mining/reclamation techniques and a logical sequencing of mining area units. This provides for vegetation recovery in some areas before views are opened by mining an intervening unit. Vegetation is to be planted or transplanted to shield views into the mine area from Highway 4. Vegetation may also dampen noise impacts. Noise impacts were further addressed by not allowing operations to take place on weekends and holidays. Reclamation of the Las Conchas mine provided information on what was successful for the type of soils and native vegetation present. The Plan of Operation calls for recontouring the landscape and replanting areas with native vegetation. Observations over a period of several years were made at the Las Conchas site which

included periods of drought and extreme precipitation. The Plan of Operations for El Cajete incorporated this information and as a result, the reclamation techniques incorporated into the El Cajete mine Plan of Operations are considered significantly advanced over those used at the Las Conchas mine.

Hydrological impacts were investigated by an intensive drilling program to characterize the sub-surface environment. The results were documented in a hydrological report. Two monitoring wells were established. A water sampling and analysis plan was developed to meet water quality standards in cooperation with the State Environmental Department.

Patents

Patenting is a provision under the Federal Mining laws which allows mining claim lands to be purchased outright by claim owners. Once purchased, the land becomes private property and the owners may do whatever they wish with the land. The JNRA Act however, prohibits patenting within the JNRA.

When the Act was passed, mining claim owners had already filed an application to patent 23 claims which are within the JNRA. The claimants have since filed a law suit for what they believe is the loss of their right to patent the areas described within their patent application. This law suit is pending.

GOALS, STANDARDS, AND GUIDELINES

Continue to consider noise, recreation use, and visual impacts when planning mine areas.

Continue to improve reclamation technology by incorporating new information learned in on-going reclamation efforts.

Improve communication and cooperation between various publics and State and Federal Agencies in regard to mine planning, administration, monitoring and reclamation actions.

Possible Actions

Invite interested public to participate with the Forest Service in mine planning efforts or in monitoring compliance under approved operating plans.

Regularly communicate with potentially affected residents to report on status of proposed or on-going mining projects or reclamation efforts.

Participate in State (mining) Permit Application process review, and continue to invite State Agency review under Forest Service NEPA process.

Fire

Natural Fire History and Current Risk

In the past, naturally occurring fires (lightning fires) were a primary factor in developing and maintaining forest ecosystems in the southwest. Studies of fire scars indicate that previously, natural fires occurred quite often. These frequent fires would spread through abundant grasses and pine needles on the forest floor, and were usually of low intensity. The following table shows the estimated frequency of fire in different vegetation types prior to the turn of the century.

SPECIES	FREQUENCY
Ponderosa pine	2-10 Years
Mixed conifer	5-25 Years
Piñon/Juniper	10-30 Years
Gambel oak	30-100 Years

The fire scar studies show that in the late 1800's there was a sharp decline in the frequency and number of fires throughout the southwest. This decline has been attributed to the reduction in the amount of fuel (grasses and ground cover) available to carry fire. This reduction was likely due in part to livestock grazing and the clearing of land for homes and communities.

By the turn of the century, aggressive fire suppression was common and became more effective as access to forests and fire fighting technology improved. As a result, in less than a century, fire was virtually excluded from southwestern ecosystems. The absence of natural, regularly occurring fire had detrimental effects on the structure, composition and function of southwestern forest ecosystems.

In some places in the JNRA, heavy ground cover, downed logs, and dense forest conditions have created a high fire hazard (MAP 4). As a result, the potential for catastrophic wildfires is present in some areas which threatens the ecological resources and recreation area values. There is an especially high risk of crown fires where the dense forest vegetation creates a "ladder" from the forest floor to the tree canopy. Depending on how close the tree crowns are, crown fires can move through the tree canopies and burn vast acreages in a matter of hours. In addition, the oak and bosque shrublands along the southern end of the Jemez River and along the Rio

Guadalupe have high fuel hazards and are capable of supporting a fast moving brush fire.

In the Jemez Mountains, several such fires have occurred over the past 20 years, including the Dome (1996), La Mesa (1977), Porter (1976), and Cebollita (1971). Portions of the Porter and Cebollita fires burned within the JNRA. The Dome and La Mesa wildfires burned within two miles of the JNRA boundary. These four fires were completely outside any historical range of statistical variability which occurred under the natural fire regime within the JNRA.

Currently the Forest Service is shifting from *fire suppression* to *fire management* and emphasizing the importance of fire's role in certain ecosystems. The Jemez Ranger District has taken an active role in planning and implementing large scale prescribed burns aimed at restoring the forest to conditions which will allow natural fire to resume its role in maintaining healthy ecosystems.

Human Caused Fire History and Current Risk

Human use of the forest has continued to grow over the past several decades. In the JNRA, recreation users number in the tens of thousands. The increase of users to the forest has led to an increase in human caused fires. The greatest concentration of human caused fire in the JNRA is along State Highway 4 from San Antonio Campground east to Las Conchas Campground. From 1986-1992, the number of human caused fires ranged from 1-10 per year. From 1993-1996, that number ranged from 17-49. The most frequent source of human caused wildfires are abandoned campfires. Other causes include cigarettes, sparks from two-cycle engines and chainsaws, children playing with matches, burning candles, arson, and trash burning. There is often flagrant use of fireworks in the forest during dry seasons. The Dome, La Mesa, Porter, and Cebollita fires were all human caused. Human caused fires are increasing, yet the fire fighting personnel on the forest is decreasing due to funding. It seems clear that visitors and residents have not all been adequately educated about fire prevention needs and methods.

Campground hosts and Forest Service employees make efforts to communicate fire prevention messages to the public in a variety of ways in the

JNRA. Materials and information are made available through the Jemez Ranger District office to visitors. Fire Prevention programs are conducted at the various schools, camps and in surrounding areas by request. Signs are posted throughout developed sites, in areas of popular use, and on major roads within the JNRA. In times of severe fire danger, restrictions are placed on campfires and some areas are closed to the public.

Wildland/Community Interface

Fire management in the JNRA is especially complicated in areas referred to as the "urban interface" where the forest or "wildlands" interface with communities. The communities of Jemez Springs, Sierra de los Pinos, La Cueva, Sulphur Springs, Cañon, and Gilman are within or adjacent to the JNRA boundary. Seven Springs and Thompson Ridge are within one mile of the JNRA and are accessed by traveling through the JNRA.

People are building further into the forest and the forest is continuing to encroach into the currently open meadows creating a fire hazard surrounding established communities. The communities of Sierra de los Pinos, Thompson Ridge, and Seven Springs are under the greatest threat from wildfire. In the Sierra de los Pinos urban interface, a fuel break is currently under construction and a 7000 acre prescribed burn is scheduled for 1998. The completion of these two projects should significantly reduce the hazard presented by a wildfire. Additional projects focussing on constructing fuel breaks and providing fuels hazard reduction are in the planning phase for Thompson Ridge, Seven Springs, Jemez Springs, La Cueva, and Sulphur Springs.

The community of Jemez Springs presents less of a hazard due to the fuels adjacent to the community. Parts of La Cueva and Sulphur Springs are in or adjacent to large meadows which provide a relatively safe situation. Cañon and Gilman are surrounded for the most part by fairly discontinuous fuels. The 1993 Buchanan prescribed burn substantially reduced the nearest threat to Gilman by reducing the dense ponderosa pine stands which existed to the west and northwest of the community. However, the condition of the fuels and topography surrounding some communities and the lack of fire safe building materials in some homes, may continue to present a

high level of hazard in some communities in spite of hazard reduction projects.

The potential of a fire moving from the forest into the urban interface is closely paralleled by the threat of a fire moving from the interface onto the forest. Fires may start from trash burning, use of chainsaws or motorbikes, smoking, fireworks, or from a fire inside a home. Areas where the most serious threats to human life occur are where there is a combination of high fuel hazard conditions and a high risk of human or lightening caused fire. While Forest Service personnel cannot enter structures and are not equipped or trained in structural fire fighting, fires in the urban interface pose the greatest threat to the safety of firefighters because they are fought more aggressively due to the high value and risks associated with life and property.

Hazardous fuels and fire situations affecting the JNRA do not end at the JNRA boundaries. Thus, the Forest Service is forming cooperative agreements with Pueblos and communities that are mutually affected by the fire hazard situation. Fuel hazard reduction is important both on and off the National Forest lands in areas adjacent to the JNRA such as Virgin and Joaquin Mesas.

GOALS, STANDARDS, AND GUIDELINES

Reduce the risk of catastrophic wildfires.

Use management ignitions and natural ignitions (lightning) to enhance and accomplish resource objectives, particularly in fire dependent ecosystems.

Design management treatments to imitate some of the historic lightning caused fire patterns that occurred in the JNRA prior to aggressive fire suppression.

Reduce the number of human caused fires in the JNRA. Inform and educate visitors to the JNRA and residents surrounding the area about fire prevention.

Increase public awareness of the benefits of prescribed fires. Inform publics about occasional

short duration reductions in air quality due to smoke from burns or controlled natural fires.

Identify, prioritize, and protect wildland urban interface areas at risk to wildfires.

Possible Actions

The risks associated with wildfires may be reduced by using natural and management ignited prescribed fires. Other fuel treatments include thinning and pruning of trees to eliminate ladder fuels and other heavy fuel accumulations.

Human caused fires may be reduced by increasing public awareness through fire prevention programs, community outreach, media information, and brochures.

Increasing the amount of law enforcement and prevention efforts during times of high fire danger in the JNRA, especially around the 4th of July when fireworks are used, may also reduce human caused fires.

Wildland urban interface areas may be protected by developing a strong partnership between the Forest Service, the State of New Mexico and the various private land owners. The partnership will provide opportunities for pooling of funds and will involve all parties with planning and implementing projects that cross ownership boundaries. These partnerships will address how to reduce and maintain acceptable fuel hazard levels, fire suppression roles and responsibilities, communication processes, and training needs.

Vegetation

When visiting the JNRA, one can expect to view a wide range of vegetation (Map 5). From colorful displays of lush grasses, shrubs, and flowers to a range of coniferous and deciduous trees. Most of the forest communities in the area are located below 9,500 feet in elevation and fall into two defined life zones, the Transition and Canadian.

Coniferous Trees

At lower elevations, within the Transition life zone (5,600 to 7,500 feet elevation), a piñon-juniper forest community is present. Higher within the Transition zone, pure ponderosa pine stands and a mixture of ponderosa pine, Douglas-fir, white fir, limber pine and blue spruce can be viewed. These higher elevation forests are often referred to as "mixed conifer" because a mixture of species can occur at any particular location. Above the Transition zone (about 9,000 feet) is the Canadian life zone, where Engelmann spruce and sub-alpine fir or corkbark fir dominate.

Of the forested area within the JNRA, approximately 51% consists of ponderosa pine and dry mixed conifer tree types, 26% consists of woodland tree types (piñon pine, one-seed juniper, Rocky Mountain juniper, and Gambel oak), 22% is comprised of wet mixed conifer trees (white fir, blue spruce, and limber pine), 1% consists of aspen, and less than 1% consists of spruce-fir.

Deciduous Trees

Deciduous trees (trees that lose their leaves in the winter) common to the JNRA include oak, aspen, Rocky Mountain maple, cottonwood, willow, and alder. Oak is often located within the ponderosa pine and Douglas fir communities, but is seldom larger than oak brush. Aspen and Rocky Mountain maple are generally found in the wetter areas of the mixed conifer forest along with the Douglas fir, white fir, and spruce. Sometimes aspen can be found as pure stands in areas that have been severely burned. These stands are most noticeable in the fall when their leaves change and they grace the hillsides with glorious gold tones. Cottonwoods, willows, and alder are drawn to moisture and can be found at lower elevations where they provide cool shade along stream channels and adjacent to springs.

Forest Health

While it may not be obvious to all visitors of this scenic area, in some parts of the JNRA, the long-term health of the forest is at risk. Management activities over the past 100 years (fire suppression, timber harvesting, and grazing) have altered the tree species make-up, density, and distribution.

The absence of frequent, low-intensity natural fires has had a significant impact on the health of the forest. Without natural fire, many stands have become overly dense thickets of very small or pole-sized trees. These dense stands limit the natural growth of understory plants, suppress the growth and development of old large trees, increase the potential for insect and disease infestation, and inhibit the movement of large animals through the forest. These "unhealthy" stands are at risk to catastrophic fire which in turn results in a lack of biological diversity and a risk to many natural resources.

The lack of natural forest fires has also changed the vegetation patterns in the JNRA. Where aspen once existed as a patchwork of small stands over the landscape, it has been shaded out by firs and spruce. In places, there is a lack of snags and large down logs for wildlife habitat. Grassy meadows are being lost to tree invasion. Oak brush and ponderosa pine components are being reduced as spruce and fir species encroach into tree stands. The understory plants are also suffering due to closed canopies. Loss of understory plant cover influences wildlife species and may contribute to changing hydrologic patterns within the JNRA.

Research Natural Area

Monument Canyon Research Natural Area - consists of 640 acres located in Section 9, T18N, R3E. It was established in the 1930's to monitor the "natural" processes of a ponderosa pine stand evolving free of disturbance. It should be noted however, that ponderosa pine growing free of disturbance is actually an abnormal process in nature.

The ponderosa pine ecosystem evolved for thousands of years in a regime of frequent disturbance by fire. Mature stands were

characterized by large ponderosa pine growing in even-aged groups with an understory of grasses and forbs. Early surveys showed an average of 35 trees per acre growing in these stands. Monument canyon supports an average of 3000 trees per acre. Large areas are closed and shaded with virtually no understory growth. The health of remnant mature pines (some are over 400 years old) is showing signs of sudden decline likely due to severe overcrowding and competition with smaller trees. The remaining stand of pole and sapling size trees are growing in overcrowded conditions and are unable to thrive.

The research being gathered is varied and has been critical in documenting the fire history of the Jemez Mountains. This controlled environment has offered invaluable data regarding the effects of excluding disturbance from an ecosystem born of fire.

There is a conflict in allowing this stand to continue toward its demise which would ultimately be by fire (Moir and Deitrich, 1988). In applying a fire behavior model (Rothermel, 1991), a crown fire in this stand would be predicted to over-power the influences of topography and wind. This is due to the massive volume of fuel available in the form of a dense stand of stagnated trees. A fire of this magnitude would threaten the communities within the Vallecitos de los Indios, located one mile to the east. Fire fighter safety and the surrounding historical and natural resources would also be threatened. A fuelbreak has been constructed and other hazard reduction projects are ongoing surrounding the Research Natural Area. These will reduce the risk of a fire spreading into this section of land. However, it would be desirable to reduce the hazard within the Research Natural Area. Any work would be done in cooperation with the researchers involved. The information gathered as we bring this stand into a sustainable condition would be as valuable as the data gathered as it grew to its current state.

Harvesting and Wood Products

Wood products have long been an important resource to the communities of Northern New Mexico. Timber management began in the Jemez Mountains in the early 1900's when the area east of State Highway 4 was referred to as the Jemez National Forest. Land to the west of State Highway 4 was privately owned up until the 1960's. While almost all suitable areas in the JNRA were harvested

at least once in the past, clear-cutting was not common. In fact, the majority of the harvests were partial cuts.

Partial cuts called *sanitation/salvage* cuts began with removal of insect infested and diseased trees. However, these treatments could do little to improve the health of the rapidly changing forests. Increasingly, *intermediate cuts* were used to reduce the density of the overstocked stands. Regeneration cuts called *shelterwood and seed tree cuts*, were also used to replace an entire stand by leaving seed trees standing to seed and establish a new stand.

Today, the Santa Fe National Forest practices a more conservative policy related to timber removal using primarily uneven age management. Treatments are aimed at maintaining a continuous, yet diverse, forest cover over the landscape. Harvest treatments are now less apparent to visitors, and timber removal is used as a tool to improve overall forest health. Two timber sales (the Guadalupe and Bench) are currently being implemented in the JNRA.

While large product removal has played a key role in the history of the JNRA, small products and non-commercial thinning have also been utilized. The small products available in the JNRA play an important role in the lives of individuals living in the surrounding communities. Small products include vigas, latillas, and fuelwood. Many homes in the area are constructed out of resources from the National Forest. These homes often incorporate heavy wood beams (vigas) interlaced with aspen poles (latillas) in their roofs. Wood products are also used in the construction of corrals and fences. Perhaps one of the most important small products available is fuelwood. In many of the homes located in the surrounding area, wood stoves and fire places are often the sole or main source of heat throughout the snowy winter months.

Understory and Riparian Vegetation

When people describe the vegetation in a forest they often focus on the overstory trees. The understory plant life, however, is very diverse and makes up an important part of the ecosystem. In the JNRA, a wide variety of plant species provide a blanket of vegetative color beneath towering trees.

Understory plants are composed of grasses and forbs (known as herbaceous species), and shrubs (known as woody species). They grow under the canopy of trees, in openings such as meadows, and along water courses (riparian areas). The understory is very important because it stabilizes the soil, limits erosion, and provides an important source of forage and cover for a variety of wildlife and livestock. Some common upland grasses, forbs and shrubs found in the JNRA are listed below by their common name:

Grasses: mountain brome, mountain muhly, Arizona fescue, June grass, blue grama, wolf-tail, pine drop-seed, Indian rice grass, bottle-brush, squirrel-tail, orchard grass, little blue-stem, three awn, Kentucky blue grass, and Nebraska sedge.

Forbes: yarrow, sagewort, fleabane, wild strawberry, and vetch.

Shrubs: Kinnikinnick, deerbrush, mountain mahogany, buckwheat, ground juniper, Gambel oak, and New Mexico locust.

Riparian vegetation is especially important. It provides habitat for a variety of wildlife, stabilizes streams banks, and captures sediments before they are deposited into streams. By preventing sediment from entering streams, fish habitats are protected.

Understory and riparian plants not only support wildlife, they also provide an important resource to humans. Many plants in the JNRA were used prehistorically for food, dyes, medicinal treatments, and in manufacturing tools. Wild oregano, onion, currant, Indian rice grass, raspberries, and strawberries likely provided flavorful additions to the prehistoric diet and continue to be used today. Dyes and paints are manufactured from rabbitbrush (yellow dye), Beeplant (black designs on pottery), and Paintbrush (red dye). The medicinal qualities of yarrow, wolfberry, and broom snakeweed are well known to the Pueblo people living adjacent to the forest and the stout branches of some shrubs (currant and locust) provide favored hardwoods for manufacturing bows and arrow shafts. Traditional communities continue to use understory plants for ceremonial, medicinal, and traditional purposes. Therefore, maintaining access to traditional use areas is important.

In portions of the JNRA, the abundance and diversity in the understory vegetation has been negatively affected. Past activities such as overgrazing, construction and use of roads, off road vehicle use, timber sale activities, beaver removal projects, dispersed camping, and fire suppression have reduced the abundance and diversity of understory and riparian vegetation.

Today, project planning involves careful consideration of effects on riparian areas. As a result, the general health of riparian areas within the JNRA has improved, but much can still be done to rehabilitate areas that have been previously damaged.

Along the Jemez River and its tributaries, riparian vegetation is in a generally healthy condition. Above the community of Jemez Springs, the riparian areas are rather narrow with alder, willow, and a variety of sedges and grasses dominating the area. Below Jemez Springs the flood plain of the canyon widens with cottonwood dominating the flood plain and willow and alder being present along the streambanks. Threats to this riparian area include non-native species which are beginning to out compete native plants.

The Rio Cebolla from Fenton Lake to Porter Landing consists of a wide flood plain dominated by willow, alder, and wet meadow vegetation. Localized portions of this area are in poor condition resulting from past grazing practices, timber sales, and road use. Today, a significant impact to this area is related to recreation activities. Fragile meadows are currently being driven through and dispersed camping has resulted in trampled vegetation.

GOALS, STANDARDS, AND GUIDELINES

When compatible with the act, continue to provide wood products in the form of saw timber, fuelwood, and vigas and latillas as a tool to improve forest health .

Protect sensitive plant species.

Promote the health of forest overstory, understory, and meadows.

Work in cooperation with the Monument Canyon researchers to gather research as well as provide for the safety of nearby communities.

Allow research in the Monument Canyon Research Natural Area to incorporate treatment of vegetation as part of proposed and ongoing research projects.

GOALS, STANDARDS, AND GUIDELINES
(continued)

Restore understory vegetation in heavily impacted areas.

Consider the unique Research Natural Area values in fire suppression strategies when working in or adjacent to the area.

Allow prescribed fire, using planned and unplanned ignitions in the Monument Canyon Research Natural Area to maintain the fire dependent ecosystem.

Possible Actions

Sensitive plant species may be protected by enhancing forest health through thinning and burning projects, minimizing new road construction, monitoring road use in localized areas, and closing/obliterating non-system roads.

Forest health (overstory, understory and meadows) may be promoted and improved through vegetative thinning projects and prescribed burn fire treatments.

Unnatural vegetation conditions in the Monument Canyon Research Natural Area may be addressed by identifying opportunities to work with researchers to bring the stand back to its natural condition. Selective thinning and vegetation treatments may be employed. Fire hazards in this area may be reduced by providing a defensible fuel break surrounding the area.

Native riparian vegetation may be retained in the Lower Jemez and Rio Guadalupe by conducting treatments to remove non-native plants.

Recreational impacts on understory vegetation may be reduced by closing and fencing off sensitive areas and seeding, spreading slash, and distributing woody debris to bring areas back to a healthy vegetative state.

Wildlife

Threatened, Endangered and Sensitive Species

The Jemez Mountains provide habitats for a variety of threatened, endangered, and sensitive species such as the Mexican spotted owl (threatened), northern goshawk (sensitive), and the peregrine falcon (endangered). The following is a list of threatened, endangered, and sensitive species that occur or could potentially occur in the JNRA. The status of some species is noted as *sensitive*. This is a Forest Service designation while the terms *endangered*, *threatened* and *species of concern* are defined by U.S. Fish and Wildlife Service.

Common name	Status
American peregrine falcon	Endangered
Mexican spotted owl	Threatened
Bald eagle	Threatened
Northern goshawk	Sensitive
Zone-tailed hawk	Sensitive
Flammulated owl	Sensitive
Spotted bat	Sensitive
Occult little brown bat	Species of concern
Yuma myotis	Species of concern
Long-eared myotis	Species of concern
Fringed myotis	Species of concern
Western small-footed myotis	Species of concern
Long-legged myotis	Species of concern
Townsend's big-eared bat	Species of concern
NM jumping mouse	Sensitive
Pine marten	Sensitive
Say's pond snail	Sensitive
Wood lily	Sensitive
Jemez Mountain Salamander	Sensitive

The species in the preceding list utilize a variety of forested habitats in the JNRA and surrounding area for nesting, roosting, and foraging. Habitat areas range from canyon/cliff areas to riparian zones. An important component to some habitats are snags and down logs. Down logs provide cover for wildlife. Snags and other trees with cavities provide desirable nest and roost habitats for many species. Unfortunately, snags are sometimes taken (poached) without obtaining a permit from the Forest Service, and down logs are often removed by the public for fuel wood.

The continuous increase in visitors to the JNRA may increase potential conflicts with some wildlife species. In addition, there has been a concern that northern goshawk populations and reproduction rates may be declining. Several factors including past timber harvesting, fire suppression, livestock grazing, and drought may be associated with the current status of this species. Mexican spotted owl habitat is being mostly affected by the overly dense stands of small trees that without treatment, will not develop into suitable mature forest habitat, and could be destroyed by stand-replacing wildfires.

Game Species

Wild turkey, mule deer, elk, black bear, and mountain lion are the primary game species in the general area. Gambel quail is a desirable game species that no longer occurs in the area. While hunting for some is considered a sport or recreational activity. For many traditional communities hunting is a necessary part of their subsistence.

Over the past decade, wild turkey numbers and distribution have declined in the Jemez Mountains. A combination of climate factors and declining habitat diversity are probable causes for the current low density population. Because of the low population, the spring turkey hunt has been suspended over the past two years.

Mule deer population in the JNRA (and entire Jemez Mountains) is also considered low due to the cumulative effects from poaching, past unlimited hunting, recreational use, road densities, and habitats becoming denser as a result of fire suppression.

During the late 1800's and early 1900's, the elk population in New Mexico was essentially nonexistent. Attempts were made to reintroduce Rocky Mountain elk to the state and in the 1940's and 1960's a number of elk were transplanted in the Jemez Mountain area. Today, it is estimated that about 8000 elk inhabit the Jemez Mountains. Some are concerned about the elk population in the Jemez Mountains and believe that there are too many elk while others feel there are not enough. While elk move around the Jemez Mountains, they tend to congregate in the area known as Baca Location #1. During the winter months, however, they often move to lower elevations and drift in and

out of the JNRA. In places there is a lack of winter range which results in concentrations of elk overusing some areas, leading to resource conflicts. Some believe the large elk population has resulted in competition for forage and a decline in mule deer numbers. There are also conflicting opinions about hunting elk. Some believe that no hunting should occur while others depend on hunting to supplement their diet.

Black bear is a popular game species in the Jemez Mountains. While populations have fluctuated over the past several decades, the bear population has increased over the past few years. The increased number of bears may be due to the implementation of more hunting restrictions and the elimination of spring bear hunts. Currently conflicts between bears and recreationists are rare. However, with recreation increasing and bear populations increasing, there may be an increase in bear and human confrontations.

Mountain lion habitat is present within the JNRA but the species is rarely seen. Extensive statewide hunting of predators in the early 1900's resulted in significant population declines. Today, hunting is seasonally limited and mountain lion populations are recovering. There have been no recent reports of conflicts between mountain lions and humans in the JNRA.

Fisheries

Non-native fish populations of rainbow and brown trout occur in the East Fork of the Jemez River, San Diego Canyon, Lower Jemez River, Rio Cebolla, and Rio Guadalupe Creeks. The Seven Springs fish hatchery provides the Department of Game and Fish with rainbow trout for stocking. Brown trout are currently not being stocked as their population is reproducing on its own. Native to the Jemez Mountains is Rio Grande cutthroat trout, however, this species is no longer present in the JNRA. In general, fishing pressure is considered to be relatively high partly due to streams being easily accessible.

Other Species

A variety of migratory birds, non-game species, and predator species are present in the JNRA providing

opportunities for wildlife and bird watching. Coyotes, kit foxes, bobcats, raccoons, ring-tail cats, skunks, migratory birds, rodents, beavers, and rabbits are present. Wolves once roamed this area but no longer occur. These species are dependent on a variety of habitat areas and at times, there are conflicts with human use of areas that previously provided habitat to these species.

Over the past five years, beavers have gradually expanded their range within the JNRA. Conflicts between beavers and human use of riparian areas occur near developed and dispersed recreation sites. At times, beaver dams result in flooding of recreation areas or roads. Also, people report unsightly chewed trees and stumps resulting from the construction of dams.

Wildlife and Habitat

Forest conditions and human occupancy and use are the primary factors that affect the viability of wildlife species and their habitats. Road density and recreation use is high in some places in the JNRA which causes harassment of some species and interferes with their movement or ability to access more suitable habitat or water sources.

Reductions in fire occurrence in the Jemez Mountains has led to a gradual decline in habitat quality and biological diversity (i.e., species composition, relative plant health or vigor, and forest structure). The lack of fire has resulted in: accumulations of woody fuel materials; increases in small trees, primarily nine inches in diameter or less; increases in tree competition for water, sunlight, soil nutrients, and other resources; increases in the threat of disease, parasites, and insect impacts; deficits of large trees greater than 18 inches in diameter; declines in openings and savannas; and changes in the abundance and composition of plant species in both the understory and overstory.

Declining biodiversity poses a considerable threat to the viability of wildlife species and their habitats. Forest managers are concerned that they may not be able to restore sustainable ecological conditions soon enough to aid in the recovery of threatened or endangered species.

GOALS, STANDARDS, AND GUIDELINES

When planning Forest projects, emphasize/incorporate the needs of threatened, endangered, and sensitive species and the habitats to the extent possible.

Maintain and develop breeding and foraging habitats for Mexican Spotted Owl, Northern Goshawk, and other raptors according to the guidelines as specified in the 1996 Forest Plan amendments.

Reintroduce Gambel quail to the JNRA.

Improve mule deer and wild turkey habitats and limit hunting until the population has recovered.

Maintain or increase the existing elk population as a resource for hunting and wildlife viewing.

Increase the amount of winter elk range habitat and calving areas.

Maintain or improve black bear habitats. Minimize the potential conflicts between black bears and recreationists.

Re-establish Rio Grande cut-throat trout populations in areas above Soda Dam and the Gilman tunnels.

Where desirable, improve riparian and aspen habitat conditions to encourage beaver colonization. Control beaver numbers and distribution to reduce undesirable impacts to riparian areas, roads, and recreation sites.

Enhance wildlife habitat.

Enhance wildlife viewing opportunities.

Identify and reduce conflicts between recreation use and wildlife access to existing water sources and other key areas.

Manage game and non-game habitat in a manner which contributes to the recreational experience.

Possible Actions

Elk habitat and populations may be improved by working with the New Mexico Department of Game and Fish and by identifying and seasonally closing calving and wintering areas to vehicle access.

Rio Grande Cut Throat trout may be re-established by working with the New Mexico Department of Game and Fish to identify possible re-establishment methods such as renovating the Seven Springs fish hatchery; converting it into a hatchery for Rio Grande cutthroat trout.

Aspen regeneration programs may include burning and timber harvesting in selected areas.

Wildlife breeding and wintering areas may be enhanced through projects including prescribed burning and thinning. Habitat may also be enhanced by closing roads and limiting access to sensitive habitat areas. Planning the location, design, and season of use for new and existing recreation facilities may also further reduce impacts to wildlife habitat.

Conflicts between recreation users and wildlife species may be reduced by developing upland water sources for elk, deer, and other species. Selective lowland water sources can be designated for wildlife use while other areas remain open for recreational use.

Livestock Grazing

The Jemez Ranger District and surrounding area contain several small predominantly Hispanic villages. Spanish village residents retain their traditional values and depend on the use of natural resources, including grazing and use of forest products. While livestock grazing contributes to the economy of local communities and counties, for most permittees in northern New Mexico, grazing is generally not a commercial venture. Rather, it is a means of subsistence. Grazing cattle contributes to a sense of personal identity, prestige within the community, pride of life-style, and a feeling of self-sufficiency. Maintaining this traditional way of life helps create a strong sense of community and family values.

Permittees in the Jemez Mountains are generally families who depend on several sources of income and do not make their sole living from livestock production, but, a good portion of their income does come from livestock. An average permittee with a 20 cow-calf herd will typically sell 15 yearlings annually for a gross income of about \$5,500-6,000. The permittees who graze cattle in the JNRA primarily reside in the surrounding communities of Jemez Springs, Cañon, Gilman, Ponderosa, San Ysidro, Cuba, Española, Pena Blanca, Bernalillo, Rio Rancho and Albuquerque, and continue to have strong ties to the area. They typically own small ranches (<200 acres) and their permits to graze cattle on public lands have been integral to their overall operations. Most have long family histories of grazing the lands that now make up these grazing "allotments".

Since the 1960's, people of other cultural backgrounds have moved into communities around the Santa Fe National Forest. Many have relocated from urban areas, commute to Albuquerque, Santa Fe, or Los Alamos for employment and use the forest for primarily recreational activities. They are concerned about the effects of cattle grazing on the National Forest, and some feel that cattle grazing on public land is not compatible with protecting natural resources and recreational values.

Seven allotments are within or overlap portions of the JNRA (Map 6 and 7). The developed recreation areas within the JNRA are off limits to grazing. In addition, most of the riparian areas are not grazed. For example, the main stem of the Jemez River and nearby slopes to the mesa tops are not grazed and

the East Fork Jemez from Jemez Falls to the confluence with the Jemez River is not grazed. With the exception of a 2-3 acre administrative horse pasture in La Cueva, San Antonio Creek is not grazed from San Antonio Campground to the confluence with the East Fork of the Jemez River. Small parcels of private pasture land are grazed along the Jemez River below Jemez Springs and San Antonio Creek in La Cueva.

Limited seasonal grazing occurs in the majority of the remaining riparian zones within the JNRA. Due to high recreational demand and riparian vegetation concerns, grazing management in these areas tend to be for short durations (1-3 weeks) and during the time of year when recreational use is relatively low (prior to Memorial day and after November 1).

The remainder of the JNRA falls within upland areas characterized by mixed conifer. Primary recreational users in this area are hunters, cross country skiers, snowmobilers, and sightseers that take short forays off of the main highway. Grazing within these areas occurs during summer months for extended periods of use. Some areas are grazed on a rotational basis for 3-8 weeks varying the season of use annually, while other areas are grazed season long (June through October).

In general, range conditions in areas with dense overstory are in poor to fair condition as the over abundance of trees has resulted in competition for light and water. In these areas, the amount of ground vegetation is decreasing. Lack of fire has contributed to overstory encroachment into meadows and grasslands which previously provided abundant understory forage.

In grasslands, meadows, previous timber sale locations, and in areas where the tree canopy is more open, the range condition is considered as fair to good. These areas are stable and some are showing signs of improvement due to improved grazing management practices.

While traditionally the JNRA has been used for both grazing and recreation activities, conflicts between recreation and cattle grazing have been increasing in recent years. Some hikers and mountain bikers do not want to use trails used by cattle, or to camp in areas where cattle have bedded, primarily due to the cow manure in those areas. On the other hand,

ranchers have sometimes been blamed for trash in the area that was actually left by recreation visitors. One conflict between grazing and recreation occurs when allotment fences limit access or do not have adequate crossing areas for recreation users. Some fences have been cut down by hikers, causing an unfortunate cost and burden on the permittees who have to maintain the fences. Some people dislike the appearance of barbed wire fences, however, pole fences that may be more aesthetically pleasing to some, are more expensive.

Sometimes forest users leave gates open which allows cattle to access riparian areas during unscheduled grazing periods. This problem is most common in Fogon Canyon. Here, when gates are left open, cattle are able to access the riparian zone at a time when heavy dispersed camping is occurring. Another problem occurs when hunters and campers use or camp within or around corrals at times when ranchers need the corrals to work their cattle.

One of the conditions affecting grazing management in the JNRA is that there are currently not enough water developments to provide for grazing away from all streams or natural water sources. In addition, forage availability is well below the potential of the area due to overly dense forest stands that limit the growth of grasses in the understory. Also, some closed roads have been limiting permittee access to water wells and their ability to effectively move cattle from pasture to pasture.

Each allotment is broken into grazing management units (pastures). The following section summarizes each allotment.

San Diego Allotment

The San Diego Allotment is the largest allotment (area and head months grazed) on the Jemez Ranger District. The allotment was established in the mid-1960's when the San Diego Land Grant was obtained by the Forest Service. Prior to 1950 it was estimated that approximately 7100 head of sheep, 250 head of cattle, and 100 head of horses grazed the area for a total of 11,000 head months. A head month is a term used to describe the amount of grazing use in a specific area over a period of time. As an example, ten head months could refer to one animal using an area for ten months or ten animals using the area for one month. A 1967 watershed

condition survey indicates that the allotment had been "badly abused", and grazing was eliminated from the area from 1967 to 1972.

Today the allotment is grazed by approximately 262 head of cattle for a total of 2235 head months, only twenty percent of the grazing level prior to 1950. Currently, the allotment is managed under a rest rotation grazing system, where grazing duration and time of use in most grazing units are altered annually. Grazing areas encompassed by the JNRA, are within Guadalupe Canyon, Cebolla Canyon, Lake Fork Canyon, Lake Fork Mesa, Schoolhouse Mesa, and the south side of the canyon along State Highway 126.

Cebolla-San Antonio Allotment

Prior to the 1970's, the allotment was grazed by cattle, sheep and horses. In the early 1970's the allotment was converted to strictly cattle use. Only a small portion of this allotment falls within the JNRA. A total of 311 head of cattle utilize this allotment from June 1 through September 30 under a deferred rotation grazing system. Then, a portion are removed and 149 head continue to graze through October 30. The majority of grazable rangeland within the JNRA portion of this allotment is found within the canyon bottom on the south side of State Highway 126 east of Fenton Lake and near the Horseshoe Springs area. This area is shared with the San Diego Allotment in which the San Diego Grazing Association uses the area in the spring, while Cebolla-San Antonio permittees use it in the fall.

V Double Slash Allotment

Formerly the Jemez, Paliza, San Jose, and Borrego Allotments, the portion which falls within the JNRA is within the watershed to the south as seen from State Highway 4 with the Baca Location #1 to the north. The portion falling within the JNRA has been managed for cattle use as early as the 1940's. Throughout the 1970's and 1980's it was managed under a rest rotation system from June 1 through September 30. Currently it is managed under a deferred rotation grazing system and the area within the JNRA is typically utilized from July through September by 148 cattle. This allotment also contains a portion of the East Fork of the Jemez Wild and Scenic River and the East Fork Trail which are popular fishing, swimming, hiking, dispersed

camping, and cross country skiing areas. Because these areas are also accessible to cattle, some conflicts of uses may exist.

Vallecitos Allotment

The JNRA portion of this allotment falls within Cat Mesa and the western slopes of Cerro Pelado. This allotment has been managed for cattle grazing since the 1930's. It received a high degree of use from sheep trailing through to market from the Baca Land and Cattle Company and trespass horses (approximately 65 head). Up until 1983, it was managed as one grazing unit with season-long grazing from May 1 to October 31. It is currently managed under a four pasture deferred rotation system and is utilized by 102 head of cattle. Generally, cattle graze the JNRA portion of the allotment in the months of June through September.

Las Conchas Allotment

The JNRA entirely encompasses the Las Conchas Allotment which lies north of State Highway 4 and south of the Baca Location #1. The East Fork Jemez Wild and Scenic River flows through the allotment, however, the majority of it is currently off limits to grazing.

Prior to 1946, the allotment was primarily grazed by about 30-40 head of cattle and horses. Between 1946 and 1970 it was primarily grazed by 25 horses. Since the 1970's it has been grazed by 25-27 head of cattle. It is utilized from June 1 through September 30 under a deferred rotation grazing system. The East Fork of the Jemez River is off limits to grazing from Las Conchas fishing site downstream to where it enters the V Double Slash Allotment. This was implemented in 1997 to minimize conflicts with recreationists along the East Fork Trail. Cattle use of the remainder of the East Fork of the Jemez River within this allotment will likely be further restricted as water sources are developed on upland sites and fences are erected to stop cattle from entering the riparian zone.

Peralta Allotment

The JNRA overlaps the northern portion of Peralta Allotment in the headwaters of Peralta Canyon

draining to the south and the north facing viewshed as seen from State Highway 4 just prior to entering the Baca Location #1. This allotment has existed at least since the 1920's. Due to extremely rough topography preventing substantial fencing, this allotment has been managed as one pasture and is grazed season-long from June 1 through October 15 by a total of 100 head of cattle.

Del Norte Allotment

The JNRA overlaps the northern portion of Del Norte Allotment in the headwaters of Medio Dia and Bland Canyons draining to the south and the north facing viewshed as seen from Highway 4 just after entering the Baca Location. Although records of this allotment only date back to the 1940's it can be assumed that cattle have grazed under permit at least since the 1920's. Due to rough topography, this allotment has been managed as one pasture and is grazed season-long from June 1 through October 31 by a total of 80 head of cattle.

GOALS, STANDARDS, AND GUIDELINES

Improve range management practices.

Improve range conditions and provide higher quality forage designed to provide better distribution of animals.

Open and maintain roads as needed for proper grazing management, such as to access water developments and to move cattle between pastures.

Design fences to accommodate recreation use and minimize vandalism to fence lines. Enforce regulations when individuals are caught cutting fences.

Minimize conflicts between range and recreation use.

Minimize cattle use along the East Fork of the Jemez River.

Possible Actions

Range management practices may be improved by modifying pasture use schedules, modifying the season of use, developing allotment plans, constructing fences and water developments, and retaining seasonal grazing limits in riparian areas.

Range conditions and forage may be improved by thinning and burning areas to encourage grass and shrub regeneration.

Conflicts with recreationists may be reduced by minimizing cattle use in riparian zones and installing walk through fence crossings.

Cattle use along the East Fork of the Jemez River may be minimized by limiting access to the river through installing fences, limiting time and season of use, and by developing alternative water sources.

Heritage Resources, Prehistoric, Historic, and Traditional Uses

The JNRA contains a rich and extensive prehistoric record that has been largely unrecorded. The area also contains a record of the more recent historic past including the remains of both Hispanic and Anglo settlements. Evidence of past ranching, mining, and timbering activities is also present.

The JNRA Act specifies that management must ensure protection of religious and cultural sites. The Act also recognizes religious values as part of the purpose for establishing the JNRA. Often in this document, and especially in the Social section, *religious* values or uses are discussed or referred to as *traditional* values or uses. Religious or traditional practices and the location of special sites are not discussed in specific detail due to their sensitive nature and significance to surrounding communities.

Archeological evidence indicates that the Jemez Mountains have been used by people since 10,000 BC. While no sites dating to this early period have been recorded within the JNRA, stone tools from obsidian sources in the vicinity have been found at Paleo Indian sites throughout the southwest. These tools provide evidence that the resources of the Jemez Mountains were used by humans as early as 10,000 years ago.

The earliest recorded sites in the area date to around 5,000 BC and consist of chipped stone scatters left over from making stone tools used in hunting, food processing, and other daily activities.

Jemez Cave, located along the Jemez River above Soda Dam, has some of the earliest known evidence of agriculture in the region dating to 881 BC. During this period, the Jemez Mountains were likely used seasonally for hunting and resource gathering.

A more settled farming life-style appeared in the northern Rio Grande in the period from AD 600-1175. Populations in the region continued to increase between AD 1175-1350, likely related to movement of people from the north out of the Mesa Verde and Chaco Canyon areas. These periods are not well documented in the Jemez Mountains. However, following these periods, evidence of significant population growth is present in the archaeological record.

The majority of sites in the Jemez Mountains were constructed and occupied after AD 1300 and are

considered ancestral to the Pueblo of Jemez. Both oral tradition and archaeology indicate that the Jemez People migrated to the area from the north sometime before AD 1300. They lived in villages, farmed, and hunted on the mesas and in the canyons of the Jemez Mountains as do their descendants today. They built pueblos ranging in size from 50 to 3000 rooms and consisting of two, three, and four stories. These are some of the largest archeological sites in North America. It is believed that the population of the Jemez area before Spanish contact may have been around 30,000.

Early Spanish contact was made by Coronado's expedition in 1541, but the Jemez lifeway changed little until Spanish colonization of the region began in 1598 under the leadership of Don Juan de Oñate.

With Spanish colonization, the Jemez were forced down from the scattered mesa top pueblos to villages in San Diego Canyon. Here it was easier for the Spanish to maintain control. A mission was established at *Guisewa* (Current Jemez State Monument) and another, *San Diego de la Congregacion* was likely constructed at what is now the present day Jemez Pueblo of *Walatowa*.

During the 1600's, discontent with Spanish rule, fueled by famine and disease, grew among the Pueblo peoples of the region. In 1680, the Jemez joined forces with other Rio Grande groups in the Pueblo Revolt which forced the Spanish out of the area for 12 years. During the Spaniards' absence from 1680-1692, the Jemez abandoned Jemez Pueblo and returned to the villages on the mesas.

Reconquest of the pueblos began in 1692 with defeats of the Jemez by the Spanish in 1694 and 1696. After 1696, some of the Jemez went west for several years before returning in the early 1700's to Jemez Pueblo or *Walatowa*. *Walatowa* has been continuously occupied since that time.

During the late 1600's and 1700's, land grants were made in the name of the Spanish Crown to Pueblo peoples and to Hispanic settlers to encourage colonization, farming, and ranching. By 1800 sheep herding and cattle raising were growing in importance.

Mexico gained its independence from Spain in 1821, and New Mexico became a Mexican territory.

Following the Mexican War, New Mexico became a part of the United States in 1848. During the mid and late 1800's and early 1900's the importance of farming, ranching, and mining grew.

The Forest Service history in the Jemez began in 1905 with the creation of the original Jemez Forest Reserve. In 1915, the Jemez and Pecos Forest Reserves were combined to create the Santa Fe National Forest. Since that time, land use has included recreation, commercial logging, fuelwood harvesting, grazing, and other activities.

In 1922, the logging industry began in earnest in the Jemez with construction of the Santa Fe Northwestern Railroad to haul logs to local saw mills. The Gilman Tunnels, which are located on Forest Road 376, were created during railroad construction.

In the 1930's the US Government established a Civilian Conservation Corps to put unemployed workers of the Great Depression on conservation projects in America. Roads, camps and picnic areas were built by the CCC. The CCC also conducted erosion control projects and planted trees throughout the national forests. In the JNRA, Battleship Picnic ground and Paliza Family Campground were former CCC camps, and currently contain facilities constructed by the CCC. In addition, State Highway 4 was constructed from Jemez Springs to Los Alamos by the CCC. Some rock masonry work can still be found in the headwalls of long abandoned drainages, and is also present on Forest Roads 10 and 269.

Large portions of the JNRA have not been surveyed for archaeological remains. However, based on areas that have had archaeological surveys, some estimates can be made. Currently, over 600 sites have been recorded in the JNRA and it is anticipated that there may be well over a thousand additional sites that have yet to be documented. Prehistoric sites include large pueblos, one to four room fieldhouses, artifact scatters, caves, rock shelters, and rock art (petroglyphs). Historic sites include old logging camps, cabins, railroad grades, mines and corrals. Several sites are currently listed on the National Register of Historic Places and many additional sites are considered eligible to the Register but have yet to be nominated.

Because of the rich cultural background and related use of the Jemez Mountains by traditional communities, a number of issues must be taken into consideration in managing heritage resources in the JNRA. For example, increased road and recreation use has resulted in higher visibility and accessibility to archaeological sites. This increase has led to unintentional damage to archaeological sites. The damage occurs by camping on sites, sitting on fragile ruins, parking or driving over artifact scatters, using rubble from prehistoric structures for campfire rings, and moving surface artifacts through casual collecting. Theft and vandalism also occurs in the form of illegal digging of artifacts and collection of cultural material from the surface of a site. In addition, when archaeological sites are marked by the Forest Service for management purposes, it tends to draw attention to them and invite pot hunting. The site marking can also detract from the natural aesthetics of an area.

GOALS, STANDARDS, AND GUIDELINES

Respect traditional use of forest resources. Address the needs of local pueblo groups and communities. Continue to provide opportunities to conduct traditional activities.

Maintain a balance between protecting the fragile archaeological resources and traditional use areas while providing the public an opportunity to experience the archaeology of the Jemez Mountains.

Explore alternative ways of identifying archaeological sites for protection (other than painting boundaries) during project implementation.

Educate the public on the significance of archaeological sites and their fragile nature.

Protect archaeological sites and monitor on a regular basis. Continue to enforce laws against robbing and desecration of archaeological sites.

Develop volunteer programs where local residents can help monitor and report activities on sites.

Evaluate and nominate, as appropriate, known sites in the JNRA which are not currently listed On the National Register of Historic Places.

Monitor and document all sites listed on the National Register of Historic Places and other high priority sites every other year.

GOALS, STANDARDS, AND GUIDELINES
(continued)

Stabilize or repair damaged important cultural resource sites.

Encourage partnerships and work with pueblo and traditional communities to manage and protect cultural resource sites.

Possible Actions

Disruptive activities in traditional use areas may be reduced by administratively closing selected roads and allowing access for traditional activities. Informing and consulting with tribal and traditional community leaders on proposed projects may help ensure that traditional sites are not impacted.

Alternative site marking techniques may include using biodegradable flagging tape to identify sites. Also, existing paint may be removed from trees in areas where no on-going projects are being implemented.

Publics may be educated on the significance of archaeological sites through: conducting talks in local schools and communities; providing site tours, stabilization and interpretive projects; and distributing brochures and posters to visitors.

Protection of sites may be promoted through increasing law enforcement patrols, fencing high risk areas, and installing remote sensing devices. Volunteer programs where local residents can monitor selected sites may also offer increased protection to sites.

Social

Introduction

The assessment team evaluated the social, cultural, and economic influences, conditions, and trends in and around the JRNA, in the context of the purposes of the Act. Information was gathered from meetings with the public, oral interviews and conversations with individuals, and knowledge gained from past planning efforts. General information was also gathered from publications such as the Statewide Comprehensive Outdoor Recreation Plan (SCORP, 1996), 1990 County census and tourism reports, Bandelier National Monument 1995 visitor surveys and data, and the Jemez Mountain Trail Corridor Plan (a 1996 joint planning effort completed by the Sandoval County Tourism department and the Indian Pueblo Cultural Center). National trends were researched through a 1995 survey on recreation and the environment. In public meetings and oral interviews, questions were asked about topics such as: what are the demands (public desires) and perceived supplies of various types of recreation opportunities; what conflicts exist among different types of uses, values, or user groups; what are the public expectations about management of the JRNA, and several others. While some level of social assessment has been done, we do not assume that the Forest Service is aware of all aspects of the social and cultural uses and values in this area.

Social assessment results are also described in different sections of this document where they relate to other topics. For example, the social, cultural or economic factors related to livestock grazing, mining, firewood and timber cutting, hunting and fishing, or the use of fire, can be found in separate sections on grazing, mining, vegetation, wildlife, and fire. Much of the other social assessment results are found in sections on recreation, scenery, and heritage resources.

This section summarizes the key sociocultural influences, and adds information about population characteristics, recreation and tourism, and public safety/law enforcement.

Key Sociocultural Influences

Social characteristics and issues span a wide range of topics and it is critical to consider social values in project planning. The public generally would like

the Forest Service to find an appropriate balance in providing for the growing recreational demands in this area while maintaining traditional uses and community needs unique to this area. The Forest Service tried to gain a better understanding of how humans once used this land prior to it being managed by the agency, and to better grasp the feelings and values expressed by people who live in this area. We also tried to improve our understanding about the needs and values of the thousands of people who will visit this area each year.

The values and traditions of Pueblo inhabitants have influenced this area for at least 600 years. Their ancestral lands are located on the National Forest. Pueblo ruins scattered across the landscape attest to their past and serve to reinforce their connection to the land. Visiting ancestral sites and shrines located on forest land is not just an important aspect of their traditional life, but a necessary part of their existence.

In addition, the Spanish have been in the area for the past 400 years. They also feel a connection to forest lands. Stories from grandparents detailing past experiences in the forest are often remembered and cherished. Revisiting familiar places on the forest where their ancestors once lived is an activity that provides a sense of connection to the land, unlike that of the occasional recreational visitor.

One cannot discount individuals, not of Spanish or Pueblo descent, who have decided to live in or visit this area for a wide range of reasons. They also feel a connection and sense of ownership to the land in this particular area.

Key traditional uses include collecting plants for medicinal and traditional purposes, grazing to maintain a way of life, cutting fuelwood to keep homes warm, hunting for subsistence, and visiting ancestral sites to maintain identity. It is important to consider these uses in managing JNRA resources, resources that are inter-connected to hundreds of years of continuous human use.

Before passage of the JNRA Act, many believed that designating a portion of the Jemez Mountains as a National Recreation Area would substantially increase visitation to the area. Our research identified that recreation use, new residential development, and tourism in the area had already increased at an exponential rate. Given the existing

trends, it is unlikely that the area will ever return to an "undiscovered" state.

There has been an enormous increase in the number of people driving through and recreating in this area. Considering this, it is understandable that these relatively rapid social changes have already had a significant effect on the local communities, their traditional uses, and their way of life.

In addition, the current expansion of State Highway 44 from Bernalillo to Farmington will likely attract more travelers. The Federal Highway Administration's proposal to improve the State Highway 126 from La Cueva to Cuba could also result in attracting more people seeking a scenic route through the mountains.

Population Characteristics

The following information on population characteristics has been summarized primarily from the 1990 census data. This summary is not intended to provide a comprehensive account of 1990 census data. Also, it is important to note that this information is almost a decade old and in some cases may not accurately reflect the changes that have occurred since the last census. What it does provide is a general picture of growth trends which appear to have continued since 1990. In some instances, 1990 percentages are noted to emphasize the amount of growth that has occurred. At other times, generalizations are made which note increases or decreases rather than exact percentages. Finally, county annual income figures are also not considered to accurately reflect the annual income of these same counties in today's economy.

While the JNRA is located in Sandoval County, it is also heavily influenced by communities in the surrounding counties of Los Alamos, Bernalillo, and Santa Fe. Based on 1990 census data, populations in each of these areas have grown over the decade from 1980 to 1990. The most rapid growth has occurred in Sandoval County which had a growth increase of 82% between 1980 and 1990. This growth has continued over the past eight years and can be largely attributed to growth in the city of Rio Rancho. During this same period, Los Alamos County experienced low (3%) growth, Bernalillo County experienced low to moderate growth (14.5%) and Santa Fe County experienced moderate growth (31%). The population growth in these counties will

likely result in increased visitation to the JNRA, especially for "day-trippers" due to their close proximity to the area.

Many of the smaller communities surrounding the forest (Ponderosa, Jemez Pueblo, San Ysidro, and Cañon) continue to be heavily influenced by traditional Spanish and Pueblo cultures. The larger communities of Rio Rancho, Albuquerque, Santa Fe, and Los Alamos show an increase in populations and influences of a more anglo-saxon ancestry (1990 Census data).

Known population characteristics specific to the JNRA (1997, Trujillo) primarily relate to a growing "mountain subdivision" population. These newer residents often move from urban or suburban areas, bringing different values and expectations to the communities.

It is likely that residents from larger communities (Albuquerque, Los Alamos, Rio Rancho, and Santa Fe) may establish a strong sense of ownership in the JNRA management. This combined with the traditional sense of ownership felt by residents of local communities (Ponderosa, Canon, La Cueva, San Ysidro, and Jemez Springs) may result in conflicts related to different management expectations.

The age structure in the communities surrounding the JNRA reflects national trends, with the greatest percent of the population in the 25-44 year old category. The greatest increase was in the 65 years or older category. Los Alamos and Sandoval counties appear to be the most rapidly aging, with, respectively, a 137% and 86% increase in 65 or older category from 1980 to 1990 (1990 Census data).

Education opportunities are increasing in larger more affluent communities. Over all, about 25% to 33% of the surrounding population 25 years and older have 4 year college degrees. In Sandoval County this percentage is at 20%, but in Los Alamos, over 50% of adults have college degrees (1990 Census data).

Per capita income in the communities varies. Unfortunately, county data does not distinguish individual community information. Sandoval County reported an average yearly income at \$10,900 yet this amount does not accurately reflect the community of Rio Rancho which is currently thriving

with well-paying job opportunities at Intel and other new businesses. Bernalillo County (represented primarily by Albuquerque) and Santa Fe County reported an annual income of \$15,300 which is just above the National average. Los Alamos County, with a per capita income of almost \$23,000 showed the highest annual income. Other than in Los Alamos County, there is a relatively high percent of the population living below the poverty level in the counties surrounding the JNRA (1990 Census Data).

The relatively low per capita income and high poverty levels may make proposals to charge user fees in the JNRA an important issue to the less affluent communities. If fees are collected, it is likely that those paying for use of the forest will closely watch to see how their money is being put to use. Visitors from more affluent communities may have greater flexibility regarding costs and user fees; however, they are likely to be just as adamant about the fairness of any fee system.

Recreation and Tourism Characteristics

National Trends

Outdoor recreation is predicted to continue to grow nationwide, though at a slower rate than in previous decades, and the rate of growth will vary by activity. The data shown in the following two tables was taken from the *National Survey on Recreation and the Environment*, 1995. It shows that people in the US, 16 years and older, participate in the following outdoor recreation activities:

Activity	Percent Participation
Walking	67 %
Sight-seeing	56 %
Picnicking	49 %
Biking	29 %
Hiking	24 %
Developed Camping	21 %
Primitive Camping	14 %

National trends over the 12 years from 1982 to 1994 show that the outdoor recreation activities that have changed the most include:

Activity	Percent Increase
Birdwatching	155 %

Hiking	93 %
Primitive Camping	58 %
Sight-seeing	40 %
Developed Camping	38 %
Picnicking	16 %
Hunting	(-11 %)
Horseback Riding	(-11 %)
Fishing	(-3 %)

State Trends

The 1996 New Mexico Statewide Comprehensive Outdoor Recreation Plan (SCORP) provides some data specific to recreation activities in the State. Visitors to recreation sites in the state most commonly participated in relaxation, sight-seeing, hiking/walking, camping, picnicking and wildlife viewing. Trails were considered the most preferred facilities, with scenic beauty being the most important quality of trails.

The reasons people gave for visiting State recreation sites were to:

- Get away/change from daily routine
- View scenery
- Relax
- Get away from crowds
- Spend time with family

Tourists who visit New Mexico from other states primarily come for the scenic beauty, Indian culture, historic sites, and outdoor recreation (NM Department of Tourism, 1994). Sandoval County conducted a market analysis to predict who were potential visitors to the Jemez Mountain Trail (designated by the State as a *Scenic and Historic Byway* and currently being proposed as a *National Scenic Byway*). A part of the trail travels through the JNRA along State Highway 4. The analysis determined that their primary visitor markets were both white and blue collar families, "upscale seniors", and Albuquerque residents. It also predicted that most visitors would be "day-trippers" interested in natural resources, with some people visiting as an extension of their visits to the Santa Fe/Albuquerque area.

In 1997, the Sandoval County Tourism Department determined that visitation to a few select recreation attractions in the county (Bandelier National Monument, Coronado State Park, Coronado State Monument, and Jemez State Monument) has actually decreased since 1991 levels, though use did peak

around 1994. Fenton Lake is the only location where 1996 visitation was greater than in 1991.

Public Safety, Law Enforcement, and Emergency Services

Emergency services and law enforcement personnel available to respond in the JNRA are limited. A Forest Service Law Enforcement Officer is assigned to the Jemez Ranger District; however, his responsibilities also include the Cuba Ranger District on the Santa Fe National Forest and the Jicarilla Ranger District on the Carson National Forest. In total, this individual is responsible for about 750,000 acres of forest land. In special situations, assistance from other Forest Law Enforcement Officers can be requested with the understanding that he may also be called to assist other Forests.

Sandoval County has assigned three law enforcement officers to the Jemez area, however, they patrol on a rotational basis so all three are not present in the area at the same time. The Village of Jemez Springs has three full time and two part time officers. Their jurisdiction generally is limited to the Village unless their assistance is requested.

Criminal violations of Federal laws fall under the jurisdiction of the Forest Service law enforcement. Examples of federal violations include but are not limited to: drug manufacture, trafficking and distribution; theft or damage to Government property; setting forest fires; and violations of the Archaeological Resource Protection Act.

Criminal violations of State laws fall under the jurisdiction of Sandoval County law enforcement. These violations can impact visitors to the JNRA and include but are not limited to incidents of rape, theft, assault, drunk and disorderly behavior, or burglary.

More common criminal activities that occur in the JNRA and affect people's safety and security include illegal and unsafe use of firearms, discharging fire arms within 150 yards of residences, camping in day use areas (especially in the vicinity of hot springs), setting off fire works, building illegal campfires, trespassing onto private land, vandalizing private and government property, abandoning animals (dogs), and behaving in a drunk and disorderly way.

The level of and responsiveness of emergency services affects the local residents as well as visitors. Emergency services (in addition to law enforcement agencies), consist of volunteer organizations in the surrounding communities. One ambulance and three rescue vehicles are available and are stationed in the communities of La Cueva, Jemez Springs, Jemez Pueblo, and San Ysidro. Los Alamos County can assist with ambulance services when needed.

Some common emergency response situations in the JNRA include: drownings, hiking and climbing injuries, car accidents, and lost recreationists. In general, emergency resources are limited in the JNRA and at times they can be overwhelmed by the needs of recreationists, which can limit responsiveness to other community emergencies. Other concerns are related to the amount of emergency resources. At times it is difficult to recruit Emergency Medical Technicians (EMT's) to provide adequate emergency support. For local residents, there is the concern that recreationists may tie up emergency services and in an emergency situation, community members may not receive prompt care. While the policy of Sandoval County Dispatch is not to deplete any areas resources to any single incident, this is a valid concern if multiple or catastrophic incidents occur. Another concern is that there are no emergency phones located along the travel ways. Funding is also a limiting factor, as little money is available to assist with law enforcement and emergency services. To some, it appears that law enforcement activity is lacking outside of the community of Jemez Springs, causing concerns regarding safety and security.

GOALS, STANDARDS, AND GUIDELINES

Identify, clarify and consider communities, social needs, and influences when planning projects in the JNRA such as the need to gather plants, cut fuelwood, hunt, graze, and access traditional sites.

Continue to provide traditional communities with access to forest resources.

Continue to provide economic opportunities to local and traditional communities.

Evaluate opportunities to collect fees and explore alternatives to collecting fees for local users.

Provide opportunities for traditional communities to present information on their culture to visitors in the JNRA.

Cooperate with local communities to improve emergency services so that local residents are assured of prompt emergency care.

Provide facilities, services and management to meet the needs and desires of the diverse populations in the surrounding communities.

Possible Actions

Social needs and influences may be better understood and considered by conducting an intensive Social Impact Analysis of the Jemez Mountains.

Economic opportunities may be provided to local individuals through small product commercial and personal use fuelwood sales.

Alternatives to standard fee collection from local community users may include reducing fees for local recreational users. Fees may not be collected if use of the forest is for a traditional activity.

Improving emergency services may be accomplished by cooperating with other agencies to meet emergency response needs, providing dollars through possible fee collections, or by providing public emergency phones.

Traditional communities may be able to present information on their culture through cooperating or involving them in developing interpretive programs, talks, or exhibits which could be displayed at the Ranger District Office or at a visitor center should one be constructed.

Recreation

For some, a trip to the forest is a chance to get away from the hot summer days in the city and from everyday pressures. For others the forest provides isolation and an opportunity to reflect. Often the forest serves as a "backyard playground" where day trips to fish, hike, picnic, and enjoy the scenery are enjoyed. For whatever reason people choose, a variety of opportunities to recreate in the JNRA are available.

Most of the developed and about 50% of the dispersed recreation use in the Jemez Mountains occurs in the JNRA. It is anticipated that this use will continue to increase. Currently, recreation use data is being analyzed using New Mexico State Highway traffic counts. Findings from this analysis will be used to assess current and future needs for the area.

The entire JNRA lies within the San Juan landscape character type which is located in north central New Mexico and south central Colorado. For ease of discussing recreation and scenery, the JNRA has been divided into *subunits*. Each subunit exhibits distinct features of rock form, water form, vegetation and land form. The subunits are identified as the Guadalupe Corridor, the Lower Jemez Corridor, the East Fork Corridor and the Lake Fork Corridor. The boundaries of these subunits are shown on the attached recreation and scenery maps.

Administration of the JNRA and Visitor Facilities

When the JNRA was established, no funds were appropriated by Congress to help manage the area. Current Forest Service funding does not provide adequate resources to manage the JNRA as a national showcase which is what the public expects. As recreation use increases, impacts to the area's infrastructure and natural environment will likely continue to escalate. To address the need for additional funding, the Forest Service is currently examining opportunities for partnerships and possible fee collection programs.

Funds were also not provided for the establishment of a visitor center. The JNRA Act states "... the Secretary shall establish a visitor center and interpretive facilities in or near the recreation area for the purpose of providing for education relating to the

interpretation of cultural and natural resources of the recreation area."

Currently, the Jemez Ranger District office is serving as an information point for all visitors to the District. At the District office, a permanent archaeological display is situated in the main reception area. Maps, information on trails, recreation sites, and fuelwood permits are just a few of the items that are available to visitors. There is minimal room for traveling type displays - a recent display presented information on fire's role in the ecosystem. A variety of books, t-shirts, cards, posters, bandannas, stuffed toys, and other trinkets are available for purchase. It is important to note that the Ranger District office was not intended to serve as a visitor center when it was constructed in the 1960's. With parking and office space limitations, this facility will not be able to accommodate increasing visitor needs. Two outdoor restrooms are provided for visitor use but they are not **universally accessible** (to be universally accessible, a facility must meet the needs of all users - children, the elderly, and people with disabilities).

While the Ranger District office can provide a wealth of information to visitors, many individuals and groups do not stop by the District Office. Often they stop in the community of Jemez Springs and request information from local merchants. This can be a burden during the busy summer season and often local merchants are not able to provide visitors with specific information on area resources. Another problem is related to restroom facilities. The water and sewer system in Jemez Springs was designed to accommodate the community, not large numbers of recreation users.

GOALS, STANDARDS, AND GUIDELINES

Continue to examine opportunities to acquire appropriated funds to help manage the JNRA.

Evaluate opportunities to collect fees to balance the costs associated with managing the resources of the JNRA.

Explore alternatives to collecting fees for local users or for traditional uses.

Explore opportunities to enter into partnerships with other agencies or organizations to provide adequate visitors facilities.

Assess potential locations for a future visitor center.

Possible Actions

Alternatives to standard fee collection from local community users may include reducing fees for local recreational users. Fees may not be collected if use of the forest is for a traditional activity.

Possible locations for a new visitor facility may be near the current Ranger District office, along NMSH 4 near the Pueblo of Jemez, or along NMSH 4, southeast of the Baca Location.

Developed Sites

The JNRA provides developed recreation opportunities in 4 of the 6 Recreation Opportunity Spectrum (ROS) classes: rural, roaded natural, semi-primitive motorized and semi-primitive non-motorized (MAP 8). A description of these classes is provided in Appendix B.

Developed sites often appeal to those who wish to enjoy nature and the forest while still having some level of conveniences. Developed sites in the JNRA include campgrounds, picnic areas, fishing access areas, and trail heads. At these sites one can expect to find some of the following: picnic tables, grills, toilets, running water, and trash facilities. Depending on the level of amenities, there may be a use fee for a developed area. Developed sites often have hosts who are available to answer questions about the area and Forest Service personnel are usually more visible in these areas.

There are several developed recreation sites in the JNRA (Map 9). The following section lists and describes similar types of sites. *Goals, Standards, and Guidelines* common to the majority of developed sites are summarized at the end of the section.

Fishing Access Sites

Five fishing access sites are located within the JNRA. Potable water is not available at any of the sites. All the sites are managed for day use only and no fee is

currently required. The sites are concentrated along the Lower Jemez River corridor and include:

La Junta - this fishing site has ten parking spaces and one double vault universally accessible toilet and trash bin. No defined access trail to the river is present. Frequent vandalism is a problem at this site.

Las Casitas - this fishing site has five parking spaces, one double vault toilet and one trash bin. A hardened trail (paved) provides universal access to a fishing pad at the river and loops back around to the parking lot. Two benches are provided along the trail for those desiring to rest and enjoy the surrounding vistas. This site experiences frequent vandalism. The fishing pad as well as portions of the trail receive damage from spring runoff.

San Diego - this fishing site has ten parking spaces and one trash bin. No rest room facilities are present. Two short hardened trails (paved) lead from the parking lot to two different fishing pads along the river's edge. A single bench is situated between both trails. Flooding during spring runoff is a problem at this site and at Las Casitas. The flooding causes damage to the trails and often destabilizes the river banks.

River's Bend - this fishing site has 12 parking spaces and one trash bin. No toilet facilities or potable water are present. A hardened trail with a native material surface provides access to the river's edge from the parking lot. This trail was not designed to incorporate universal access and as a result it has a greater level of difficulty for some users.

The Bluffs - this fishing site has ten parking spaces and one trash bin. No toilet facilities are present. A hardened trail (paved) provides universal access to one fishing pad. Two benches are provided along the trail for those desiring to rest and enjoy the great vistas.

Campgrounds

Six campgrounds are located within The JNRA boundary. One along the Lower Jemez corridor (Vista Linda), and five within the East Fork sub-unit (San Antonio, Horseshoe Springs Group Area, Redondo, Jemez Falls, and Las Conchas). All campgrounds provide a variety of amenities and

there are fees associated with most of these areas. The sites are described below:

Vista Linda - this campground has 14 overnight units (campsites). All units have a table, fire ring, and a pedestal grill and were designed to be universally accessible to the greatest extent possible. The host unit has electricity, water and septic hookups. All units can accommodate RV use and three units have an identified tent pad. Steel shade shelters are provided at six units. Two double vault toilets are conveniently located on opposite ends of the campground. Potable water and trash bins are located next to each toilet. A paved loop trail provides a safe, universally accessible route to the toilet buildings and down toward the river to two paved fishing pads.

San Antonio - this campground was constructed in 1964 and has 47 camping units. While all units are available for use, the majority of the facilities are in fair to poor condition due to normal wear and tear over the years. The host unit has a water hydrant and electricity. Potable water is available at the area, but the water system is in need of major repair. Two dual vault and two dual chemical vault toilets are provided, however, they do not meet current accessibility standards. The north end of the campground contains eight units that were originally designed as barrier free, but, in comparison with today's accessibility standards, the area requires major modification. Currently, each of the eight units contain a table, fire grill and paved parking for RV or tent use. The remaining campground units each contain a table and fire grill. These units are not universally accessible. The campground is situated adjacent to the San Antonio River which provides great fishing opportunities and is considered one of most popular campgrounds within the JNRA. Several non-system trails associated with heavy use of the river contribute to soil compaction, erosion, stream sedimentation, and vegetation loss.

Horseshoe Springs - this campground is referred to as a group area where groups of people can reserve the campground for larger functions such as family reunions or organizational gatherings. The campground is small and was constructed in 1959 to serve about 25 people. Three tables, three grills, one group fire ring, one pit toilet and one water hydrant are provided. The parking area is not developed or designed to accommodate RV use.

Because the area is small, it receives little to moderate use. Currently, this campground is within the proposed boundary for the Horseshoe Springs Land Exchange.

Redondo - this campground contains 60 units, all of which are available for use. The facility is in fair condition considering it was constructed in 1967. This site, with its large "yellow belly" pine trees attracts a large number of small RV users. Paved parking is provided to accommodate RV or tent users. Each unit contains a table and grated fire ring. Five dual vault toilets serve the campground along with centralized trash containers. None of the facilities meet current accessibility standards. An amphitheater is provided at this site, however, it is not being used for educational or interpretive programs. Continued use of the area has contributed to soil compaction and vegetation loss around the tables and grills.

Jemez Falls - this campground was reconstructed in 1989 and is in good condition with 52 units available for use. The host unit has water, electric, and septic system hookups. Ten units are designed as "barrier free" units and can accommodate people with disabilities. A table, pedestal grill, and fire ring are provided at these ten units. A table and fire grill are provided at the remaining units. All units, including the parking spaces and loop drives, have a hardened surface (chip seal). Tent and RV sites are available. The one mile access road into the campground is paved and provides excellent access for RV users. Most units may accommodate RVs up to a length of 45 feet. Centralized trash containers and potable water is provided. No utilities or dump station is available. An amphitheater with universal access and lighting is available for conducting educational programs, however, currently it is not being used for educational or interpretive programs.

Las Conchas - This facility was constructed in 1963 and is currently in need of repairs. The facility can accommodate tents, small RV's or travel trailers up to 18 feet in length. No potable water is available and no fee is required at this campground. A total of nine units are present, three of which are situated within the 100 year flood plain. Each unit has a table and fire grill. One dual vault chemical toilet and one trash receptacle serves the campground. None of the facilities meets current accessibility standards. The site is popular because of its scenic location and

proximity to the East Fork of the Jemez Wild and Scenic River.

Heavy recreational use of the site has contributed to soil compaction and vegetation loss along the stream banks and surrounding the picnic tables and grills. A non-system trail has been created by users along the top of a steep river-side retaining wall. Using this path can be hazardous. Very little vegetation is present within the campground which results in runoff carrying sediments and pollutants off the parking area and campunits directly into the stream. Another concern in this area is related to beavers. In recent years, beavers have begun to re-establish themselves in the area. While beavers are an important component of properly functioning watersheds, they can also cause localized problems. Beaver built dams can result in localized flooding and the visual quality of an area may be reduced when excessive numbers of trees are chewed or cut down by the beavers. Beavers may also be contributing to the loss of low lying vegetation in this campground. A recent decision had been approved to convert this site to day use only.

Picnic Areas

Seven designated picnic sites are located within The JNRA boundary. One along the Lower Jemez corridor (Spanish Queen), and six in the East Fork corridor (Battleship Rock, Rincon, Dark Canyon, La Cueva, Jemez Falls Group, and Jemez Falls Family). The picnic sites are managed for day use only and a variety of conveniences are provided. The sites are described below:

Spanish Queen - this picnic area has 11 picnic units, one double vault toilet, one trash bin and potable water (hand pump). All the units have a table and a rotating pedestal fire grill. This picnic area is universally accessible. Steel shade shelters are provided at four of the sites. The parking area can accommodate RV or passenger vehicles. Two universally accessible fishing pads are provided at this picnic area. A paved trail approximately 100 feet in length provides universally accessible fishing opportunities on the south side while a loop trail approximately 250 feet in length provides the same on the north end. A parking fee is required.

Battleship Rock - this picnic area has 37 picnic units available for use, however, the majority do not meet

current accessibility standards. The original facilities (tables, grills, shelter, and trail) were constructed in the 1930's by the Civilian Conservation Corps (CCC). The area was rehabilitated in 1959, and in 1979, the parking areas and the road entrance were paved. All the facilities are in poor condition due to decades of normal wear and tear and vandalism. Six individual chemical vault toilets serve the picnic area, none of which meet current accessibility standards. The area cannot accommodate RV use.

Hazards associated with the condition of the site include: congestion due to parking design; poor sight distance and steep grade at the intersection of the access road and State Road 4; poison ivy along the stream bank and around some of the picnic sites; exposed rock gabion style retaining walls and unrepaired stairs that lead to the river; and climbers on Battleship Rock who pose a threat to the safety of other climbers, hikers, and individuals picnicking at the base of the cliffs.

The picnic area also serves as a trail head for Forest Trail (FT) 137. The area receives heavy use which has contributed to soil compaction, erosion, stream sedimentation, and vegetation loss in portions of the trail area, stream banks and surrounding picnic tables and grills. This is a fee site and is scheduled for reconstruction.

Rincon and Dark Canyon - these picnic sites each have two picnic units with a table and a grill. A chemical toilet and a trash bin is located at each picnic site. The facilities are old and in poor condition due to wear and tear and vandalism. The toilets do not meet standards for sanitation and they, as well as the trails and picnic tables, are not universally accessible. No potable water is available. Soil compaction, soil erosion, and vegetation loss is occurring at the picnic sites and along the river banks. The parking areas are below the highway grade and present a visibility hazard when existing the areas. No fees are required to use these sites. Recent decisions have been made to convert these picnic sites to fishing access sites.

La Cueva - this picnic area has eight picnic units and four additional parking spaces for anglers. Three of the picnic units are universally accessible and have paved access. The site has one universally accessible double vault toilet and a

trash bin. The parking area is paved and a paved path leads to a six foot wide Corten steel pedestrian bridge provides access to picnic units across the San Antonio river. The units across the bridge are not universally accessible. No fee is required to use the area.

Jemez Falls Group - this picnic area has a capacity for 100 individuals. It was constructed in 1990 and is in good condition. A group pavilion with 16 tables, two large pedestal fire grills, a group fire ring with benches and 25 hardened surface (chip seal) parking areas are present. A centralized dual vault toilet services the area along with a centralized trash container. The site has been designed as a universally accessible site. Potable water is available and universally accessible. The picnic area is available by reservation only and a fee is charged.

Jemez Falls Family - this picnic site has four picnic units and provides additional parking for individuals accessing Trail 137 and the East Fork of the Jemez Wild & Scenic River. The site was constructed in 1990 and is in good condition. Each picnic unit consists of a table and pedestal grill. One centralized dual vault toilet and a trash container served the area. Potable water is available at the site. No fee is required to use the site.

GOALS, STANDARDS, AND GUIDELINES

Incorporate universal access into all facilities and programs in developed areas.

Improve water systems and provide drinking water at campgrounds and in other selected developed areas.

Provide information at the Lower Jemez pull-out that identifies developed facilities and recreation opportunities in the JNRA.

Provide educational and interpretive information in appropriate areas along trails, in parking areas, at campgrounds, and at picnic and fishing areas.

Continue to provide opportunities for tent camping and RV use.

Increase security and safety for recreation users and enforce regulations.

Protect developed fishing access pads and trails from spring run-off damage.

Develop and conduct interpretive programs.

Where feasible, repair and reconstruct facilities as needed.

When appropriate, maintain the character of the Civilian Conservation Corps (CCC) facilities through the use of similar materials and design elements.

Determine if existing capacity of developed recreation areas is sufficient to accommodate increasing demand.

Reduce the hazards of entering and existing at developed facilities.

Consider additional picnic and camping sites to meet the demands of the recreating public.

Manage recreation facilities located in threatened and endangered species habitat and sensitive riparian areas to strive for an overall balance between protecting natural resources and accommodating recreation use.

Possible Actions

Information may be provided to recreationists through using interpretive kiosk signs, providing brochures, having on-site campground hosts or information officers working in the field.

Opportunities for tent camping and RV use may be provided by repairing and reconstructing campgrounds to meet the needs of both users, or by constructing new facilities.

Vandalism and damage to recreational facilities may be reduced by removing existing graffiti and repairing existing damage to facilities. Additional law

enforcement patrolling and providing on-site hosts at campgrounds and other selected day use areas may deter further vandalism activities and well as improve the safety of recreationists.

River banks may be stabilized and fishing access pads protected from spring run-off through installing rock gabions, log structures or planting vegetation in areas along the river where flooding generally occurs.

Interpretive programs may include lectures and presentations at existing amphitheater facilities as well as at other appropriate locations.

The hazards associated with ingress/egress may be reduced at many locations by posting signs alerting travelers about traffic, realigning some entrance drives, improving visibility through minimal vegetation removal, and by providing new or enlarging existing pull-out parking areas.

Determining existing capacities and accommodating future demands in developed recreation areas may be addressed by conducting analysis using traffic counts and occupancy rates from existing developed facilities.

A balance between managing threatened and endangered species habitat and accommodating recreation needs may be achieved by following the NEPA process and the endangered species consultation process.

Dispersed Recreation

Dispersed recreation refers to activities that occur outside developed recreation camps, picnic grounds, or other facilities. This type of recreation use appeals to those who wish to enjoy the forest in a more natural setting. Recreationists are encouraged to follow *pack-it-in / pack-it-out* guidelines. Dispersed activity areas are generally free of conveniences such as picnic tables, grills, toilets, running water, electricity, and trash facilities. Examples of dispersed activities include but are not limited to back country camping, hiking, biking, picnicking, horseback riding, cross country skiing, driving for pleasure, hunting, fishing, and swimming.

Because dispersed recreation is unregulated, it can result in damage to resources. These impacts are

discussed under the resource most affected by the activity. As an example, for information on recreation impacts on *riparian* areas, one would refer to the *Soil, Water, Riparian* section.

The presence of Forest Service personnel is less apparent in dispersed areas. Fees are usually not collected and information, brochures, and signs are generally not provided. Dispersed recreation activities are also discussed under the four subunits previously identified: the Guadalupe Corridor, the Lower Jemez Corridor, the East Fork Corridor, and the Lake Fork Corridor. Dispersed activities in these subunits are described in the following pages. Locations receiving the heaviest dispersed use are shown on Map 10.

Guadalupe Corridor

This area represents one of the heaviest dispersed recreation areas on the Jemez Ranger District. The boundary of the area to the south begins on private land in Gilman and extends north where the Lake Fork Canyon meets with the Rio Cebolla. This area experiences heavy recreation use almost every weekend from Memorial Day to Labor Day.

The majority of the dispersed recreation use occurs along the Rio Guadalupe where every area next to the river accessible by vehicle receives overnight or day use. These highly impacted locations appear as large disturbed areas accessed by a maze of undeveloped roads. Each dispersed camping area contains numerous fire rings, litter, unsanitary conditions, heavy soil compaction, vegetation loss, and erosion. The number of users in the areas is high, and a majority of these dispersed sites are currently contributing to the degradation of riparian areas along the Guadalupe.

Along the south end of the Guadalupe area, two trash dumps consisting of rusted vehicles, old household trash and furniture exist. These dumps are unsightly and visually disrupt the recreational experience.

Lower Jemez Corridor

This area extends from the Jemez Springs Village limits south to the Jemez Ranger District boundary. There are isolated private land tracts located in the

area. Some of these private parcels are heavily used as evidenced by litter accumulations and unsanitary conditions.

Dispersed camping on forest land is limited along the corridor. With the exception of Vista Linda Campground, the entire area has been designated for day use only. Day use activities generally include picnicking, sight-seeing, fishing and occasional hiking. Undesignated parking areas where vehicles can physically pull off the road right-of-way are identified by soil compaction and erosion along the Jemez River.

East Fork Corridor

This area extends from the La Cueva area on the northeast to the western boundary of the JNRA. Dispersed use ranges from moderate to high. Portions of the area, specifically surrounding La Cueva are limited to day-use only. Year round activities range from fishing, hiking, biking, and horse back riding to firewood collecting, hunting, and cross country skiing. In response to heavy use adjacent to the La Cueva area near private lands, the Jemez District issued a forest closure on overnight camping and campfires in the area surrounding La Cueva. Today, the area receives moderate dispersed recreation use.

Currently, the heaviest dispersed use in this area occurs along portions of the East Fork of The Jemez Wild and Scenic River. One heavily used area is located at the swimming holes; locally referred to as the "jump" area. The "jump" area is not a developed site and is not designated on any Forest Service recreation maps. The Forest Service does not encourage recreation use in this area due to safety concerns related to cliff diving. Local knowledge of the area and word-of-mouth has resulted in the area being quite popular and as a result, heavily used. To access the area, individuals park along NMSH 4 and travel up the river along an undeveloped trail for about one mile. Off-road/overflow parking along NMSH 4 creates hazards for both travelers and pedestrians. Additionally, the undeveloped trail that leads to the "jump" area follows the river's edge and, in places, is causing sedimentation and erosion into the river. Rock fire rings and litter are encountered all along the trail to the "jump" area.

Another heavily used area is along the first 1/2 mile of Trail 137 from the Las Conchas trailhead to the north. Here, as well as along the NMSH 4 undeveloped parking areas, sanitation and litter are a problem as there are no trash or rest room facilities present.

Lake Fork Corridor

This area includes lands in the northwestern portion of the JNRA from the Lake Fork Canyon/Rio Cebolla confluence to the La Cueva area on the east. The area adjacent to the previously discussed Rio Guadalupe Corridor is the only portion where a live stream is found with the exception of the San Antonio River located along the eastern boundary. Because of the general absence of live streams, the area is not as attractive to dispersed recreation users drawn to water.

While the area generally receives low to moderate dispersed use, a couple areas are exposed to high use. One popular area is located at the junction of Forest Road 376 and 604. This area receives its heaviest use during the fall hunting seasons.

Another high use location is along the southern portion of the area adjacent to the Rio Cebolla. Here, large groups frequently gather in open meadow areas. In fact, this area is one of the District's most popular locations for large, organized gatherings. As a result, a maze of undeveloped roads extends into the meadow and off road parking occurs where ever an open place can be found. Off road vehicle use is causing serious impacts to the meadow area. There are no rest room and trash facilities in the area, resulting in poor sanitary conditions and scattered trash and debris.

Rivers

Crosscutting the boundaries of the four subunits are segments of four rivers as well as a congressionally designated wild and scenic river. These water courses provide visitors, many of which come from more arid environments, an opportunity to enjoy a variety of water based activities. Fishing, swimming, and camping where one can hear the soothing sound of running water are some sought after activities. The following section provides a description of the water courses within the JNRA.

East Fork of the Jemez Wild and Scenic River - The East Fork of the Jemez Wild and Scenic River Corridor contains some of the most dynamic viewsheds in New Mexico. Recreation opportunities along this river include fishing, dispersed camping and hiking along Trail 137, which parallels the river for approximately nine miles.

In 1979, the East Fork of the Jemez River was identified in a nationwide river inventory as a free-flowing river that might meet the criteria for designation as a wild and scenic river. On June 6, 1990, the U.S. Congress amended the National Wild and Scenic Rivers Act with Public Law 101-306 to include eleven miles of the East Fork of the Jemez River in the national system. The legislation designated *recreational*, *wild*, and *scenic* sections to this river. Currently, the Forest Service is completing a plan that will provide direction on how this area will be managed in the future.

The area designated as *recreational* allows for road access and some development along the shoreline. This designated segment begins at the boundary between the Baca Location and the Santa Fe National Forest and terminates two miles southwest at private land (Valle Grande Ranch boundary). The segment was designated as *recreational* due to existing developments along its shoreline.

The next four mile segment downstream is classified as *wild* because of its undeveloped shoreline, trail-only accessibility, and the absence of highway crossings within the four mile stretch. The *wild* section terminates at the next crossing of State Highway 4. Along this length of river, the watershed and shoreline is to be kept undeveloped and access is to be limited to trails only.

The remaining five mile stretch, which terminates at the confluence with San Antonio Creek, is classified as *scenic* because its shoreline, with the exception of Battleship Rock Picnic Area, is undeveloped and road access is limited to the picnic area, Jemez Falls trail head and the highway crossing. Aside from existing road access, most of the shoreline and watershed are to be managed in a primitive and undeveloped state.

An extensive network of non-system trails is a major cause of sedimentation of the river. These trails have developed from trampling impacts of hikers and

anglers "bushwhacking" through areas not served by Forest Trail 137.

Dispersed camping at popular sites along the East Fork of the Jemez Wild and Scenic River has damaged riparian vegetation and caused soil compaction and erosion in some of these areas. This is most evident at the McCauley Warm Springs, Jemez Falls, and the East Fork "Box".

San Antonio River - About six miles of the San Antonio River are located within the JNRA. The headwaters originate on the privately owned Valle Grande, capturing flow from the small tributaries that drain the northern third of the Valles Caldera. When it enters Forest Service land, the San Antonio slowly meanders through open grassland meadows for two miles. It then weaves in and out of private land, picking up energy through the narrow stretches of the San Diego Canyon, before finally merging with the East Fork of the Jemez Wild and Scenic River.

The San Antonio River is an excellent cold water fishery. For beginning fly fishermen seeking both rainbow and brown trout, the Jemez offers no better river than the upper San Antonio, where plenty of open space and fish exist and the stream is narrow requiring only small casts.

Jemez River - The Jemez River begins near Battleship Rock at the confluence of the East Fork of the Jemez Wild & Scenic River and the San Antonio River. Approximately 14 miles of the Jemez River fall within the boundaries of the JNRA with about half of those miles falling within private lands along the Jemez River.

This river receives heavy fishing pressure at all the developed recreation sites along the river corridor. During most typical winters the Lower Jemez is the only river accessible for fishing during the winter months and because of this receives moderate use during this time.

Rio Cebolla - The Rio Cebolla originates outside the JNRA at the Valle Grande. The flow begins as a small trickle and slowly increases flow as it captures additional small tributaries and springs along its course. The river enters Fenton Lake (a State Park) about 12 miles below the headwaters. The Rio Cebolla enters the JNRA just south of Fenton Lake. The river slowly meanders through open meadows,

continuing for 6 1/2 miles to the confluence of the Rio Cebolla and the Rio de las Vacas where it becomes the Rio Guadalupe.

This stretch of river receives moderate to heavy fishing pressure every weekend from Memorial Day to Labor Day.

Rio Guadalupe - The Rio Guadalupe stretches for about 14 miles, beginning at the confluence of the Rio Cebolla and the Rio De Las Vacas and terminating at the confluence of the Rio Guadalupe and the Jemez River. The entire Rio Guadalupe is within the JNRA, however, approximately four miles of the river flow through the private communities of Gilman and upper Canon.

The Rio Guadalupe provides excellent fishing opportunities, but because of its accessibility, the Rio Guadalupe receives heavy pressure from dispersed recreation users. Several dispersed sites are located along the west side of the river starting south of the Gilman Tunnels and continuing north to Fenton Lake. The dispersed sites contribute to the compaction and soil and vegetation loss along some of the riparian areas along the Rio Guadalupe.

GOALS, STANDARDS, AND GUIDELINES

Address litter and sanitary concerns at some high use dispersed areas.

Eliminate illegal dump sites and scattered litter and debris (household trash, appliances, and junk automobiles) from areas within the JNRA.

Improve or manage parking problems at dispersed sites.

Improve parking along the Rio Cebolla for dispersed use and fishing.

Manage for ROS classes shown on the attached map.

Reduce impacts from overuse along the Rio Guadalupe to improve the quality of the recreational experience.

Continue to manage the areas between La Cueva and Cañon as a day use area with overnight use limited to designated campgrounds.

Monitor and enforce campfire restrictions.

Possible Actions

Litter and sanitary conditions may be addressed by providing restroom facilities and trash containers at high use dispersed areas. Where constructing facilities is not feasible, information on pack-it-in / pack-it-out may be provided on signs, maps, or in brochures. Additional patrolling and monitoring of sites may also reduce problems associated with accumulations of trash or illegal dumping.

Parking problems at dispersed sites may be reduced by enlarging existing parking areas or constructing overflow parking areas near by. Areas where random parking is damaging resources may be closed off through signing or administrative closures, constructing barriers (rocks, fences, or vegetation), or re-establishing vegetation.

ROS classes may be managed through project planning and design as well as monitoring during and following project implementation.

Dispersed camping impacts may be reduced along the Rio Guadalupe by designating dispersed camping areas and identifying parking areas for dispersed sites. In areas of high impact, some dispersed camping sites may be closed and revegetated.

Day use areas may be managed by posting more signs identifying day use areas, increasing field presence and patrolling to ensure overnight use is not occurring. Camp fire restrictions may be more strictly enforced to reduce overnight use in selected areas.

Unique Areas

The following areas are considered Unique Areas within the JNRA. These areas are considered dispersed because they lack developed facilities. Currently, there are no user fees associated with any of the areas and conveniences are minimal.

San Diego Overlook - this developed overlook with a paved parking area was constructed in 1967 to service a short distance interpretive trail along the Banco Bonito Rim. The trail was constructed out of native materials and is not universally accessible. Interpretive signing, addressing the flora of the area, is present along the trail but has been vandalized over the years. A bench along the trail provides the public with a place to take a breather or to just sit and enjoy the view.

From the overlook, one can capture the striking panoramic view of ponderosa pine forests atop mesas cut by the 1,500 foot deep San Diego Canyon. The overlook also serves as a parking area for cross country skiers during the winter months. A dual vault toilet services the parking lot. The toilet is in fair to poor condition and is not universally accessible. No trash container and no potable water is available at this location.

The Gilman Tunnels - the tunnels at Gilman were constructed in 1922 as part of the Santa Fe Northwestern Railway project. The railway associated with the tunnels ran from the heart of the Cañon de San Diego Land Grant to the town of Bernalillo, New Mexico. Timber purchased by White Pine Lumber was hauled along the route to a mill site in Bernalillo.

The Guadalupe Box, once a narrow crevasse through which the Rio Guadalupe flowed in a rushing torrent over rocks and falls, by the end of 1923 became the site of two spectacular and expensive tunnels. A series of fills and trestles, clinging to the cliff side, connect the two tunnels. Both tunnels were hewn from solid rock and some timber lining was required to support the looser material.

Today the rails are gone. A narrow paved surface road follows the old railroad grade and winds its way through the spectacular tunnels. Driving for pleasure and viewing the scenery along this narrow canyon is a major dispersed recreation activity. A pullout just above the second tunnel allows the public to view the workmanship of the tunnel and the Rio Guadalupe below.

While the Guadalupe Box and Gilman Tunnels are interesting focal points for visitors, they attract vandalism, often in the form of graffiti.

No trash or rest room facilities are provided. As a result, trash and litter is common around the tunnels. The vandalism and litter detract from the scenic quality of the area.

Spence Hot Springs - this hot spring area is one of three natural hot springs on the Jemez Ranger District, two of which are within the Jemez National Recreation Area. Spence Hot Springs is by far the most popular and most accessible yearlong hot spring on the Jemez Mountains. Currently the area is closed from sunset to sunrise, however, many people still camp overnight and risk the chance of getting cited. Overnight camping is evident as numerous rock fire rings are present around the pools.

In addition to the naturally formed pools, several small pools have been constructed by spring users. An undeveloped dirt parking lot, originally constructed by the State Highway Department for stockpiling pumice material, serves as a parking area for hot spring users. Overflow parking often occurs in an area to the south of the first parking area. Vandalism and theft of personal items is often reported at the parking lot.

A 1/4 mile long trail, located at the southwest corner of the first parking lot, provides access to the hot spring on the east side of the San Antonio River. The Forest Service, at the request of the local fire department and rescue unit, constructed a single log bridge across the river in 1995. Additional undeveloped trails extend from the parking area to the hot spring. Heavy use of these trails and the area around the pools contributes to severe soil erosion and compaction.

"Pack It In, Pack It Out" is emphasized, however, litter is common at the pool and in the parking lot. No trash or toilet facilities are present. Interpretation is limited to a single metal sign at the main pool area which describes the health risks of all natural warm/hot springs. No information is provided to visitors about the risks associated with poison ivy and visitors are not warned that they may encounter nude bathers.

McCauley Warm Springs - is considered a natural warm spring because the water temperature is in the 90 degree range (in comparison, the temperature at

Spence Hot Springs is around 100 degrees Fahrenheit). The McCauley Warm Springs is situated along Trail 137. It can be accessed from either Jemez Falls Trail head or from Battleship Picnic Area. It is situated approximately two miles in from either location.

The spring receives low to moderate use due of its accessibility; however, because the springs are located far away from developed sites, use tends to be long term. Several rock fire-rings and litter are visible around the area where overnight camping occurs. Use of the springs has contributed to soil compaction around the pool areas.

A metal sign describing the health risks of all natural warm/hot springs is displayed at the main pool area. Nudity is very common at this site but no warning is posted.

Soda Dam - this area is considered a natural wonder by many as it was formed by the placement of mineral deposits from hot springs flowing slowly, for centuries, across a portion of the San Diego Canyon floor. The mineral deposits resulted in the formation of a dam through which the Jemez River carved a path. In the mid 1960's the State Highway Department blasted its way through a portion of the dam in order to provide a route for NMSH 4. The road work diverted the once established path of the water and interrupted the natural process of minerals being deposited on the dam.

Today, Soda Dam is heavily visited by recreationists driving through the area along NMSH 4. People like to soak their feet in the small pools of hot water adjacent to both sides of the highway as well as walk the crest of the dam and photograph the Jemez River as it makes its way through the dam. Many local teenagers use the pool for swimming and diving but this activity can be dangerous to the divers and waders in the pool below.

No established parking area is present and vehicles park along the shoulder of NMSH 4. The dam is located along a curve in the road and off road parking can be hazardous. The close proximity of the associated springs to NMSH 4 poses a risk to pedestrians and travelers. No facilities or interpretive material is available at this site. Litter is a common problem along with the congestion of the pedestrians.

Jemez Falls - these falls are located within the scenic section of the East Fork of the Jemez Wild & Scenic River. The falls are approximately 100 feet high. The pool that rests below the beautiful falls provides an excellent spot for fishermen to try their luck. A hardened native material trail extending for about 1500 feet leads one from the Jemez Falls Trail Head to the falls overlook. While the short trail provides an excellent opportunity for many recreationists to view the natural beauty of the falls, the existing trail is not universally accessible.

Botanical Area - the focus of this area is on the Canadian dogwood (*Cornus canadensis*). The dogwood plants are located along the recreation section of the East Fork of The Jemez Wild and Scenic River corridor, upstream from the Las Conchas Campground. The Canadian dogwood is a rare species in New Mexico, but is not proposed for listing because it grows in many states and Canada. The area is managed as a Special Interest Area as directed in the current Forest Plan (page 50 and 146).

Currently, the botanical area is being subjected to damage by trampling from hikers and fishermen using non-system trails. Interpretive information on the area is not provided.

GOALS, STANDARDS, AND GUIDELINES

Provide adequate parking and increase interpretive and educational opportunities in unique areas.

Manage vehicle and pedestrian traffic at Spence and McCauley springs to minimize resource damage and provide safety to recreation users.

Manage the Canadian Dogwood community as a Special Interest Area. Provide interpretation in a manner which protects the unique botanical attributes of this area.

To the extent possible, improve the quality of recreation and the condition of natural resources at the hot and warm springs.

Evaluate access, use and public safety at the hot and warm springs as well as at the "jump" area.

Warn hot and warm spring users about health risks associated with using hot and warm springs.

Warn spring visitors about the presence of poison ivy.

Inform spring users about clothing options at hot and warm springs.

Reestablish the natural character of the spring areas.

Ensure overnight use is not occurring at springs.

Possible Actions

Interpretive and educational opportunities may be provided by conducting tours, distributing brochures, or posting information on-site. A self guided interpretive trail may be provided for the botanical area or at other appropriate unique areas.

Vehicle and pedestrian traffic at Spence Springs may be better managed by reducing/designating the size of the parking area and by obliterating the unofficial maze of user created trails.

Resource damage at McCauley Springs may be addressed by obliterating the maze of unofficial trails leading to the springs.

The quality of the recreational experience may be improved at Spence Springs by providing a restroom at the parking area, prohibiting glass containers, emphasizing pack-it-in/pack-it-out guidelines, increasing official presence at the area, and informing visitors about nude bathing options.

Access, use, and public safety at hot springs and at the "jump area" may be evaluated through increased patrols and public contacts, requesting input from spring users in planning processes, and monitoring the frequency that law enforcement and emergency services are needed to address issues at the springs. Future projects developed through planning may include increasing access through developed trails or facilities, limiting or closing off access to some areas,

or maintaining the existing level of access/development.

Spring users may be informed about the dangers associated with using springs and the possibility of encountering nude bathers through signs, brochures, or increased field contacts.

The natural character of spring areas may be restored through dismantling fire rings, collecting litter, educating users to pack it in - pack it out principles, and by utilizing volunteer groups to help clean up spring areas.

Overnight use of springs may be reduced by providing on-site information that identifies the area is designated for day use only. This information may also be provided in brochures or on maps. Increasing patrols in the evening may also result in decreased overnight use.

Trails and Trailheads

Trails are an important part of the history of this country. As we have moved into modern times, the primary use of our trails has shifted from a necessity as a travel route to that of a more recreational pursuit. The mode of travel has also changed and multiplied to include all manner of users--from hikers to bikers and equestrian to pedestrian.

With the exception of Trail 137, existing, maintained, system trails in the JNRA are lacking. There are currently limited developed opportunities for hiking, biking, wildlife viewing, and other recreational uses. Limited developed opportunities sometimes result in conflicts between different recreation users.

Some forest visitors prefer to use unmarked, unmaintained, non system trails and roads for recreational activities. In the JNRA, over one hundred miles of old logging roads and abandoned road systems provide for a wide variety of cross-country ski trails. These old roads have been and are currently maintained, signed, and mapped by the New Mexico Cross Country Ski Club. Many recreationists enjoy use of non-system trails; however, these trails are not signed, not maintained, and are often located in riparian areas where resource damage is occurring.

The JNRA has one developed system trail and miles of abandoned trails within its corridor. The entire 9.5 miles of Trail 137 and the 1/2 mile of combined Trail 137(a) & (b) is within the JNRA and located along the *East Fork of The Jemez Wild & Scenic River Corridor*. Currently this trail is designated as a multiple use trail with day hiking being the most popular use. Often hiking is combined with other activities including: wildlife viewing, fishing, picnicking, waterplay, camping, hunting, and rock climbing. Mountain bikers, horseback riders, cross-country skiers, and snowmobilers also use the trail.

Three main trailheads are present within the JNRA. They each access a different portion of Trail 137. No fees are required to use these areas. The eastern portion of the trail is accessed by Las Conchas trailhead, the middle section can be accessed by the East Fork and Jemez Falls trailhead, and the western portion of the trail is accessed near Battleship Picnic Area. Each trailhead is described below.

Las Conchas - parking for four vehicles is available at this trailhead. The trailhead serves Trail 137 along the "Wild Section" of the *East Fork of The Jemez Wild and Scenic River* and is the District's most widely used trail. Because of its popularity, the trailhead parking area fills up quickly and overflow of vehicles continue to line up along the highway right-of-way presenting a safety hazard to pedestrians. Heavy use of the trailhead contributes to soil compaction, erosion, stream sedimentation, vegetation loss, litter, and sanitary concerns. Other than parking, no additional facilities are present.

Jemez Falls - parking for 20 vehicles is available at this trailhead. Parking is shared with the Jemez Falls family picnic area (previously described). The trailhead serves Trail 137 along the "Scenic Section" of the *East Fork of The Jemez Wild & Scenic River*. One can access the Jemez Falls overlook from this trailhead, as well as McCaulley Warm Spring. The trailhead parking area is paved and contains one double vault toilet and one centralized trash container. Potable water is available. Several undeveloped and undesirable trails lead from the parking area to the Jemez Falls Overlook and to different areas along the East Fork River.

East Fork - parking for 20 vehicles is available at this trailhead. The trailhead is located at the lower end of "Wild Section" of the *East Fork of Jemez Wild & Scenic River* and serves that portion of the river along with the upper section of the "Scenic Section" of the *East Fork of The Jemez Wild & Scenic River*. The parking area has a hardened surface (chip seal) and contains a dual vault toilet and centralized trash container. The trash facility is not universally accessible, and while the toilet is universally accessible, the path to it is not. No potable water is available. Of the three trailheads described, this one receives the least amount of use.

Trail 137 is the most widely used trail on the Jemez Ranger District and while every effort is made to keep this trail properly maintained, certain sections of the trail are currently experiencing erosion and are in need of some major reconstruction. Signing is needed in some areas along the trail where the main trail merges with an extensive network of undeveloped trails created by fishermen accessing the river. Trails 137(a) & (b), which lead from the main trail to the river bottom, have experienced soil and vegetation loss mainly because of cattle trying to access the river.

GOALS, STANDARDS, AND GUIDELINES

Maintain and sign Trail 137 along all sections of the trail.

Manage Trail 137 as a semi-primitive, non-motorized trail.

Address litter and sanitary conditions at trailheads.

Provide water at some high use trailheads

Provide safe parking at trailheads.

Provide more developed trails and ensure that there are opportunities for motorized as well as non-motorized use.

Where appropriate, provide opportunities for 4-wheel drive off-highway use.

Possible Actions

Maintenance and signing of Trail 137 may involve the use of volunteer groups who are able to conduct routine maintenance, collect litter, and ensure signs are posted. An increase of Forest Service personnel as well as law enforcement patrols may deter vandalism of posted trail markers.

Litter and sanitary conditions may be addressed at trailheads by providing trash facilities and rest rooms at high use areas. Water may also be provided at the more developed trailheads. In these same areas, parking problems may be addressed by providing enlarged parking areas or overflow areas where trail users can safely park away from busy roads.

Additional developed trails may be planned especially in areas that are already receiving high use. New trails may be designated for different uses such as some trails may be designated for motorcycle or snowmobile use while other trails may be limited to pedestrian, equestrian, biking, or cross-country ski use.

Off-highway 4-wheel drive use may be provided by designating certain areas where this type of recreational activity would not damage other forest resources. Rather than creating new areas, old roads and skid trails may be designated specifically for this type of use.

Scenery

Be prepared to encounter extraordinary landscapes when visiting the JNRA. Scenic attractions include dramatic views of conifer covered mountain peaks, open mountain meadows, a Wild and Scenic River, impressive volcanic rock formations, and dazzling red rock cliff faces. The color, variety and vastness of the landscape can be overwhelming.

The scenery in the JNRA is best described by detailing the qualities present in four landscape subunits. The Guadalupe Corridor, the Lower Jemez Corridor, the East Fork, and the Lake Fork. These subunits are described in the following pages. For more technical information, including detailed explanations of the terms associated with the following discussion, please refer to Appendix C.

Guadalupe Corridor

This area ranges from natural appearing landscapes to areas heavily altered by human activities; however, the natural beauty, harmony and scenic integrity of the area remains virtually intact. Extraordinary views of mesas, rocky cliffs, meadows, and canyons await the visitor.

Dispersed recreation (pleasure driving, camping, fishing and picnicking) is popular in the Guadalupe area. Main attractions and unique areas include: the Gilman Tunnels, the Guadalupe Box, and the lush meadows along the Rio Guadalupe and Cebolla.

The communities of Cañon and Gilman are located in the southern portion of the area along New Mexico State Highway (NMSH) 485 and Forest Road (FR) 376. The original residents built their homes along the main roads. As more families moved into the area, subdivisions began to move up the steep, dry slopes above the Rio Guadalupe. Some of these newer residences appear to represent a more transient life-style with few finished living structures. Because some of these developments are in the immediate foreground zone of the roads, views to the distance are blocked. As a whole, the number, density, and distribution of new homes is changing the scenic quality of the surrounding landscape.

As FR 376 passes through Cañon and Gilman, its alignment frequently directs visitors' views toward the mesa to the east. The red rock mesa and canyon walls become more prominent and overwhelm the

view shed as one approaches the Gilman Tunnels. After passing through the tunnels, FR 376 becomes a more narrow, gravel road north of the Guadalupe Box, reinforcing the less developed characteristic of the area. While the Guadalupe Box and Gilman Tunnels are interesting focal points for visitors, they attract vandalism in the form of graffiti. Additionally, trash and litter is common around the tunnels. The vandalism and litter detract from the scenic quality of the area and present a poor public image.

Further up FR 376, the river corridor widens and the lay of the land is such that large and small dispersed groups, as well as individual families can be accommodated along the Rio Guadalupe. Because there are no designated dispersed sites, or number restrictions, people recreate wherever they choose, often in very close proximity to other groups. As a result of uncontrolled vehicular and pedestrian traffic along the Rio Guadalupe, much of the riparian area is severely impacted, appearing heavily altered. These dispersed recreation sites tend to expand in size from years of use. The condition of these dispersed sites detracts from the scenic quality of the immediate surroundings. The riparian area is also being degraded in the spring when cattle graze in the meadows along the Rio Cebolla.

The following paragraphs discuss the classification of this landscape sub-unit with more technical terminology. Please refer to Appendix C for an explanation of the terms associated with this discussion.

The majority of this sub-unit is classified as *Distinctive*. These landscapes are located primarily in the foreground and some middleground areas of Forest Road 376 north of Gilman to almost the end of the sub-unit. Characteristic features include the dramatic, steep, rocky and narrow canyon of the Guadalupe Box and Gilman Tunnels, and the broad, lush meadows along the Guadalupe and the Cebolla.

Typical (common) landscapes are generally found in middleground, and to a lesser extent, foreground areas of FR 376. These areas are so designated for terrain and lack of water features. They are further removed from the Guadalupe; the terrain is more gently rolling and lacks the notable rock outcrops found in the Distinctive landscapes.

Middleground and some foreground areas around Gilman and Butterfly Springs have been classified as *Indistinctive* (minimal), due to relatively even slopes, distance to the river, and lack of diversity in the vegetation composition.

This sub-unit consists of 11,463 acres, of which 10,287 are on Forest Service land. Of the Forest Service land, 7,759 acres (75%) have a Visual Quality Objective (VQO) of Retention, located primarily in foreground and middleground zones of FR 376. Partial Retention includes 2,164 acres (21%), located in the Minimal Landscapes in the middleground zones of FR 376. Modification accounts for 225 acres (2%), while 139 acres (1%) have a VQO of Maximum Modification. The latter two VQOs are located in unseen or seldom seen areas.

Lower Jemez Corridor

To access the JNRA from the south along NMSH 4, travelers will first pass through the Pueblo of Jemez. Immediately north of the Pueblo are spectacular red rock cliffs which stand in contrast to the surrounding deep green pinyon and juniper vegetation. The stunning Jemez red rock area is located on lands managed by Jemez Pueblo. Travelers are asked to respect the significance of the area and abide by tribal regulations when stopping to experience the scenery. As one travels further up the Highway, occasional glimpses of the Lower Jemez River can be seen to the west. For travelers, the river and the red rocks serve to build a sense of anticipation and curiosity for what lies ahead.

Elevations in the Lower Jemez range from 5700 to 6100 feet. Piñon-juniper is the dominant vegetation along the side slopes of the mesas while the Jemez River flood plain is dominated by Rio Grande Cottonwood with riparian lowland shrubs and grasses. Ponderosa pine and other conifers are found at higher elevations along the mesa tops. The vegetation provides an interesting mix of open and closed spaces, creating a varied pattern of light and shadow. Dense cottonwood bosques alternately enclose the highway or pull away to open up views while tracing the course of the river.

The visual and spatial diversity in this subunit is high. In the southern portion, broad, expansive vistas extend to distant mesa tops. As one nears Jemez

Springs, the views close in and narrow. Throughout the area, the Jemez River and adjacent mesas dominate the landscape. The river provides an element of motion in an otherwise unmoving landscape of mesas and rock. The highway acts as a corridor to experience the spectacular views. It follows the contour of the land and in places, imitates the flow of the river, creating a continuous element of surprise for what may be revealed around the next bend. Unfortunately, soil that has been carried along the drainages and deposited in or near the highway is frequently scooped up and dumped just off the highway, with seemingly little regard for impacts on the vegetation or aesthetics.

Overall, the natural setting for this subunit appears slightly altered by human activity and developments including: private residences, small businesses, electric lines and poles, and the Lower Jemez Recreation Area facilities. However, given the grand scale, vibrant colors and textures, strong form, line and stunning beauty of the mesas, the human modifications remain subordinate to the overall character of the surrounding landscape.

This entire landscape sub-unit is classified as *Distinct*. It contains 5,899 acres; 5,104 are on Forest Service property. The VQO of Retention includes 4,146 acres (81%), located in the foreground and middleground zones of NMSH 4. Most of the rest of the sub-unit (919 acres, 18%) has a VQO of Partial Retention because these areas are not seen from the highway. Modification (33 acres) and Maximum Modification (6 acres) each account for less than 1% of the Forest Service acreage.

East Fork

New Mexico State Highway 4 is the main travel corridor through this subunit. As the road winds its way through mountain and meadow landscapes, a sense of mystery and intrigue is experienced as new exciting views are revealed around each bend. The Highway provides direct access to many recreation areas including: La Cueva Picnic Ground, Dark Canyon and Rincon fishing sites, Battleship Picnic Ground, Redondo Campground and Soda Dam. The Highway also provides access to the parking areas associated with Spence Hot Springs and McCauley Warm Springs.

The character of the vegetation and landforms provide a mix of open and closed spaces. Spectacular, but all too brief views of Redondo Peak and the surrounding mountains are glimpsed only as the highway changes direction or the vegetation gives way to small openings. In places, the road appears as a ponderosa pine tunnel which slowly opens to dramatic rock formations and narrow, steep canyons. Traveling south toward Jemez Springs from the community of La Cueva, the highway corridor widens to provide views of Cat Mesa and Virgin Mesa.

A special scenic area, located within this portion of the JNRA, is the East Fork of the Jemez Wild and Scenic River. The river originated as a small meandering stream in the vast grassland crater of the Valles Caldera. As it carved its way to the south and west, rugged, sheer-walled canyons were created. Along the canyon, stretches of conifer trees, including Canadian dogwood, are present. The river flows past the small Las Conchas Fishing Site, crosses under NMSH 4, and crosses through a short stretch of private land containing a ranch quarters before passing back under the highway.

Again, the river enters a rugged stretch of canyon where sheer cliffs and huge boulders are covered with thick mixed conifer forest vegetation. In places, the river flows from canyon wall to canyon wall, making passage impossible without wading or using foot bridges along the stream. Occasionally, a bend in the river will lead to an open lush meadow. The last segment continues through another rugged canyon, past Jemez Falls Campground and hot springs to the Battleship Rock Picnic Area. Here, the East Fork joins with the Rio San Antonio to form the Jemez River. Trail 137 parallels portions of the East Fork of the Jemez Wild and Scenic River, allowing recreationists the opportunity to experience this stunning landscape.

While the NMSH 4 provides access to this highly visual landscape, some features associated with the highway detract from the natural forest setting. Exposed pumice deposits bare of vegetation are present along some of the highways cut slopes. These bare, light colored slopes contrast strongly with the darker, vegetated natural terrain, detracting somewhat from the visual quality of the area. In places, dense mixed aged ponderosa pine stands crowd both sides of Highway 4, creating a claustrophobic, tunnel vision feeling. Many

ponderosa pine, particularly in and around the location of the proposed El Cajete Pumice Mine, are also diseased and dying. The poor health of the pine stands and the crowded, dog hair thicket spacing detracts from the scenic integrity of the area.

Despite some of the visual distractions noted along NMSH 4, the natural appearance of this subunit appears only to be slightly altered by the roads, clusters of private residential areas, the community of Jemez Springs, Las Conchas Pumice Mine, and developed recreation sites. These developed areas are relatively small, located away from the highway, and screened by fairly dense vegetation allowing for the natural character of the area to remain dominant.

Distinctive landscapes in this sub-unit include stretches along Trail 137 where it parallels the East Fork of the Jemez Wild and Scenic River (EFJW&SR), and along NMSH 4 near Las Conchas Fishing Site and from just north of Las Conchas Picnic Ground to Jemez Springs, and along NMSH 126 from intersection with NMSH 4 to just past San Antonio Campground. These areas have been so classified because of the presence of the dramatic rock formations, a permanent, meandering stream, and diverse vegetation--stands of ponderosa pine, mixed conifers, spruce-fir and clumps of aspen interrupted by undulating meadows near the Baca and Vallecitos.

The majority of this sub-unit is classified as *typical* (common) landscape, as typified by the stretch of NMSH 4 at the eastern boundary of the JNRA, and from west of Las Conchas Trailhead to just before the intersection of NMSHs 4 and 126. The vegetation is predominantly even-aged Ponderosa Pine, terrain is moderately rolling with no dramatic rock outcrops or other notable promontories; the stream flow is fairly straight, constant and unremarkable in these areas with only a few gentle meanderings.

Indistinctive (minimal) landscapes in this sub-unit contain little to variety in vegetative cover. The flat to gently rolling terrain is very uniform with no uneven, dissected features, rock formations, or exposed ridge tops. Drainages are small and only occasionally carry water. These areas are not located along the major travelways in this sub-unit and found well south of the Vallecitos de los Indios private subdivision.

Interesting or unique areas in this sub-unit include views of Redondo Peak, the San Diego Canyon, EFJW&SR, Spence Hot Springs, McCauley Warm Springs, Battleship Rock, the Jemez Mountain Trail Scenic & Historic Byway, Soda Dam, Cerro Pelado, Jemez Falls, the Botanical Area near Las Conchas Fishing Area, and the Research Natural Area along Forest Road 135.

This sub-unit consists of 31,128 acres, of which 24,468 are located on Forest Service land. Of this, 13,805 acres (56%) have a VQO of Retention, located primarily in foreground and middleground zones of the major roads and Trail 137, and within the East Fork Wild & Scenic River Corridor. Partial Retention includes 7,742 acres (32%), located in the foreground, middleground, and background zones of less sensitive Forest Roads (i.e., FRs 10 and 135) or in Common or Minimal landscapes. Smaller pockets of Modification (495 acres, or 2%) and Maximum Modification (2426 acres, or 9%) occur mainly in areas not visible from the major travel corridors, trails, and river.

Lake Fork

The northern portion of FR 376 crosses through the Lake Fork subunit. Along the road, classic forest scenery including lush meadows edged by stands of mature ponderosa pine, groups of colorful aspen, and numerous rock outcrops are present. Sparse shrubby understory growth provides penetrating views deep into the forest. Stands of trees alternately enclose the road, then move away, allowing grassy meadows to define the road edge. A carpet of mixed conifers drapes itself across the landscape with pockets of aspen filling in the scars of previous forest fires. A strong sense of place and tranquility can be found in the Lake Fork area.

The dramatic contrast found in the northern portion of the Lake Fork area fades as one moves southward. Here the scenery is less diverse, the geology becomes more uniform, the aspen stands are scarce, and even aged conifer stands dominate.

While portions of the view shed lack vegetative diversity and, in places, aspen stands are scarce, this subunit appears as the least modified by human activity. Few defined dispersed recreation sites and only one developed campground (San Antonio Campground) are present. A scatter of private

residential areas and commercial operations can be found near the intersection of New Mexico State Highways 126 and 4. These structures are relatively small and spread out, and do not dominate the landscape.

Distinctive landscapes are located primarily along the foreground of the FR 376, in Lake Fork Canyon, and along some sections of the foreground of NMSH 126. In these areas, terrain is more rugged, the rock outcrops and formations are unusual and very defined, vegetation is varied, and there are occasional glimpses of water.

Only a few scattered sections of this sub-unit have been classified as *typical* (common) landscapes. Watercourses are intermittent and infrequent, the terrain is gently rolling and the vegetation is predominantly conifer stands. Although the natural elements within these landscapes are less dramatic than in the distinctive landscapes, they do create a positive and pleasing sense of harmony and intactness.

Indistinctive (minimal) landscapes within this sub-unit area characterized by unremarkable terrain, lack of water, and vegetation stands that lack diversity of species or spatial distribution. These areas are found along some sections of the foreground area of NMSH 126 and along FR 377.

This sub-unit consists of 8,172 acres; 8,153 acres are on Forest Service land. Of this, 4,587 acres (56%) have a VQO of Retention, and are located in the foreground and middleground zones of NMSH 126 and FR 376. Partial Retention accounts for 3,263 acres (40%), primarily in foreground and middleground zones of travelways. Modification has been assigned to 95 acres (1%), and 208 acres (3%) along FR 376 have been identified as Maximum Modification in areas not seen from the road.

GOALS, STANDARDS, AND GUIDELINES

Protect the existing scenic integrity and minimize visual disruptions in the JNRA.

Manage for a scenic integrity objective of high (retention) as shown on attached map.

Enhance the scenic quality along the main travel ways and Trail 137.

Enhance scenic quality across the landscape and expose rock formations and allow for views to penetrate deep into the tree stands.

Address graffiti problems surrounding the tunnels.

GOALS, STANDARDS, AND GUIDELINES
(continued)

Address scenic disruptions along NMSH 4 including pumice cut banks and removal of debris from the road during flood events.

Work with the State Highway Department to address visual impacts along NMSH 4.

Encourage greater diversity of vegetation and achieve and maintain an open park-like character in the ponderosa pine stands.

Possible Actions

Scenic quality of the JNRA may be enhanced through minimizing visual disruptions by burying power lines, planning and designing projects in ways that will minimally alter the view corridors, thinning dense or dying stands of trees to allow for penetrating views, encouraging aspen regeneration, and encouraging diversity of mixed conifer stands through vegetation treatment projects. Scenic quality may also be enhanced by maintaining meadows, exposing rock formations, designating dispersed picnic and camping areas, reestablishing riparian vegetation, and closing more heavily impacted areas.

Scenic quality may be further enhanced by encouraging county and local governments to develop some restrictions on residential and commercial developments within the JNRA.

A cooperative partnership may be established between the Forest Service and State Highway Department to address visual impacts along NMSH 4. Possible actions may include recontouring and revegetating steep pumice cut banks and exploring alternative locations for road wash, soil, and debris to be removed other than merely dumping the material off to the side of the highway.

Diverse vegetation may be encouraged by creating more frequent openings that mirror the form, line and size of existing fire created meadows which will, in turn, encourage aspen regeneration.

Transportation

Current road inventories indicate that there are about 248 miles of open road within the JNRA boundary. As the JNRA encompasses about 90 square miles, the average road density is about 2.75 miles of open road per square mile. Many of the roads were constructed for past timbering activities which began in the early 1900's when the area was under private ownership. The following section presents information of the types and condition of main roads in the JNRA.

State Highways and Forest System Roads

Today, there are three paved State Highways within the JNRA boundary, State Highways 4, 485, and 126. These highways are used by visitors and local residents to access the Jemez Mountain area. While driving for pleasure and viewing the scenery is a popular activity along the highways, these roads also serve as main travel corridors by industry for transport of materials and products.

The remaining roads within the JNRA are gravel or dirt surface roads. These roads are used by forest visitors, recreationists, permittees, private land owners, and forest personnel. The roads range in maintenance levels from Level 1 to 3.

- Level 1 roads are essentially closed, however, they may be opened for selected activities. Travel along these roads requires a high clearance vehicle.
- Level 2 roads are open but may be closed seasonally. These roads are generally not surfaced and high clearance vehicles are usually required.
- Level 3 roads are open and maintained for passenger vehicles. Travel along these roads is typically at low speeds. They are generally single lane with turn outs. Some portions maybe surfaced with aggregate or native materials.

The following section provides detailed information for the main travel ways accessing and passing through the JNRA.

New Mexico State Highway 4 is open year-round to all types of vehicles. The Highway was designated by the State as a *Scenic and Historic Byway* often referred to as the *Jemez Mountain Trail*. It is currently being proposed as

a *National Scenic Byway*. It provides access to many camp and picnic grounds in Santa Fe National Forest. It begins at the junction of State Highway 44 in San Ysidro, NM, runs northeast along the Jemez River passing through San Diego Canyon and the villages of Jemez Pueblo, Cañon, and Jemez Springs before intersecting with State Highway 126 in La Cueva. Here, State Highway 4 turns east, travels through forested landscapes, overlooks the meadows of Valles Grande, and passes near the headwaters of the East Fork of the Jemez Wild and Scenic River. The highway then exits the JNRA and continues eastward toward Bandelier National Monument.

New Mexico State Highway 126 is open spring through fall. A portion of this road is designated as part of the *Scenic and Historic Byway* mentioned under the discussion for NMSH 4. The first ten miles from Cuba to Senorita Divide and the last 13 miles from Fenton Lake to La Cueva are paved. The remaining 21 miles are gravel and best suited for high-clearance vehicles, however, the Federal Highways Administration is currently proposing to pave this segment of road through to Cuba. The highway is generally closed due to snow between Telephone Canyon and Seven Springs Fish Hatchery in the winter months. The highway climbs 1,700 vertical feet in the first ten miles from Cuba to Senorita Divide. Here, the road becomes gravel and continues in a southeast direction passing through meadows of the Rio Las Vacas, Telephone and Calaveras Canyons, Seven Springs Fish Hatchery, and Fenton Lake State Park. Three miles east of Fenton Lake, pavement begins and continues for the final 13 miles to La Cueva. At La Cueva, State Highway 126 intersects with State Highway 4 at San Antonio Creek.

New Mexico State Highway 485 begins at the intersection of State Highway 4 and winds through the community of Cañon along a narrow paved two lane road; following an old railroad logging grade as it travels up a canyon carved by the Rio Guadalupe. As it passes through the Gilman tunnels, the road narrows to one lane. At the tunnels, there are small pull outs where travelers can stop, stretch, and view the majestic canyon walls of the Guadalupe Box. A short

distance north of the tunnels, the pavement ends and the road intersects with Forest Road 376.

Forest Road 376 is usually open between May and December. It begins at the end of the pavement on State Highway 485 near the Gilman tunnels and passes through 18 miles of juniper, piñon pine, and ponderosa pine forests before intersecting with State Highway 126 near Fenton Hill. Forest Road 376 continues north for another eight miles through quaking aspen, fir and spruce forests before coming to a dead-end at the Forest Service and Baca Location #1 boundary along the Rio San Antonio. The first 7 1/2 miles is graveled and suitable for all vehicles. The remaining 18 1/2 miles is best traveled in a high-clearance vehicle.

Forest Road 10 is usually open between May and December. Portions of the road are graveled, but in general, the road is best suited for high-clearance vehicles. The road begins at the end of the pavement on State Highway 290 near the community of Ponderosa. The first three miles of road extends northward from the highway, skirting Paliza Campground along Vallecitos Creek and the scenic cliffs of San Juan Mesa. Piñon pine and juniper vegetation gives way to Ponderosa pine for the next seven miles. At the ten mile mark, the road intersects with the Cerro Pelado Lookout Road (Forest Road 270). Forest Road 10 continues through dense pine and fir forests and the meadows of the Vallecitos de los Indios area for another five miles before reaching State Highway 4.

Level 1 and Level 2 roads are numerous and many extend for short distances and subsequently dead end. These roads are generally accessed from the State Highways or off the main Level 3 roads. The attached transportation map displays Level 1 and Level 2 roads along with Level 3 roads and the State Highways.

It is clear when viewing the transportation map that portions of the JNRA are heavily roaded. Many of these roads are abandoned logging roads that are not maintained or signed, yet some recreationists still travel along them. Some recreationists and forest users would like to see more road access as they believe that too many roads are closed. Others believe there are too many roads. And, there are

those that feel the current amount of road access is good.

Because of the high road densities, motorized accessibility is provided to the majority of the JNRA. Too much access to the area has resulted in several concerns. High road accessibility can interfere with wildlife movement as well as with the Pueblo's religious practices at traditional sites.

Even with the high density of roads, off road use continues to occur. This results in new roads being created. Because these roads are not system roads, they are not signed, maintained, or patrolled. Erosion, rutting, soil loss, and riparian damage often occurs on these roads. Additionally, travelers are not always aware of the rough conditions along these non-system roads.

There are a variety of concerns related to road safety. The narrow one land road through Gilman tunnels can be dangerous as visibility along that length of road is poor and on-coming traffic is not easily observed. And, along State Highways, commercial haulers (logging, mining, cattle) can put recreation users at risk because some are unable to navigate the road system well. This is especially true along State Highway 4.

GOALS, STANDARDS, AND GUIDELINES

Reduce the number of roads in the JNRA.

Restrict off road use in some areas and provide information where off road use is designated or allowed. Regulate off road use and issue citations in unauthorized areas.

Regulate the size, speed, and weight of trucks using Forest Roads.

Alert travellers to road conditions on low maintenance roads.

Post warnings as San Ysidro (State Highway 4), and La Cueva (State Road 126) explaining that vehicles will encounter narrow winding roads.

Provide signs along State Road 485 and Forest Road 376 accessing Gilman and the Gilman Tunnels to alert travelers of the one lane road.

Improve road maintenance in the JNRA. Allow for different types of recreation use as well as for wood cutting and other activities as specified in the JNRA transportation plan.

Possible Actions

The number of roads in the JNRA may be reduced and use restricted or regulated through signing, patrolling, administrative closures, or obliteration/ revegetation.

Travelers may be alerted to poor road conditions by posting signs along roads and by identifying road conditions on transportation maps.

A cooperative partnership between the Forest Service and the State Highway Department may be developed that will allow for posting signs along State highways that will alert travelers to narrow, winding road conditions.

Road maintenance may be improved by identifying key travel ways as high priority. Additionally, some roads may be designated and posted as low maintenance roads. Funding for road maintenance and improvements may be acquired through user fees or through partnership agreements.

Appendix A

One Hundred Third Congress of the United States of America

AT THE FIRST SESSION

*Begun and held at the City of Washington on Tuesday,
the fifth day of January, one thousand nine hundred and ninety-three*

An Act

To establish the Jemez National Recreation Area in the State of
New Mexico, and for other purposes.

*Be it enacted by the Senate and House of Representatives
of the United States of America in Congress assembled,*

SECTION 1. ESTABLISHMENT.

(a) PURPOSE AND ESTABLISHMENT. - In order to conserve, protect, and restore the recreational, ecological, cultural, religious, and wildlife resource values of the Jemez Mountains, there is hereby established the Jemez National Recreational Area (hereinafter in this Act referred to as the "recreation area"), to be administered by the Secretary of Agriculture (hereinafter in this Act referred to as the "Secretary").

(b) AREA INCLUDED. - The recreation area shall be comprised of approximately 57,000 acres of lands and interests in lands within the Santa Fe National Forest as generally depicted on the map entitled "Jemez National Recreation Area - proposed" and dated September 1992. The map shall be on file and available for public inspection in the offices of the Chief of the Forest Service, Department of Agriculture, Washington, District of Columbia. The Secretary may from time to time, in consultation with local tribal leaders, make minor revisions in the boundary of the recreation areas to promote management effectiveness and efficiency in furtherance of the purposes of this Act.

(c) MAP AND DESCRIPTION. - As soon as practicable after enactment of this Act, the Secretary shall file a map and legal description of the recreation area with the Committee on Natural Resources of the House of Representatives and with the Committee on Energy and Natural Resources and the Select Committee on Indian Affairs of the Senate. Such map and legal description shall have the same force and effect as if included in this Act, except that correction of clerical and typographical errors in such legal description and map may be made. Such map and legal description shall be on file and available for public inspection in the Office of the Chief of the Forest Service, Department of Agriculture.

(d) NO ADDITIONAL LANDS. - No lands or interest therein outside of the boundaries of the recreation area may be added to the recreation area without specific authorization by Congress.

SEC. 2. ADMINISTRATION.

(a) IN GENERAL. - The Secretary shall administer the recreation area in accordance with this Act and the laws, rules, and regulations applicable to National Forest System lands in a manner that will further the purposes of the recreation area. Management of the natural resources within the recreation area shall be permitted only to the extent that such management is compatible with and does not impair the purposes for which the recreation area is established. Recreational activities within the recreation area shall include (but not be limited to) hiking, camping, hunting, fishing, skiing, backpacking, rock climbing, and swimming.

(b) MANAGEMENT PLAN. - The Secretary shall, no later than 5 years after the enactment of this Act, develop a management plan for the recreation area, as an amendment to the Santa Fe National Forest Land and Resource Management Plan, to reflect the establishment of the recreation area and to conform to the provisions of this Act. Nothing in this Act shall require the Secretary to revise the Santa Fe National Forest Land and Resource Management Plan pursuant to section 6 of the Forest and Rangeland Renewable Resource Planning Act of 1974. During development of the management plan for the recreation area, the Secretary shall study newly designated land within the recreation area, and adjacent national forest land.

(c) CULTURAL RESOURCES. - In administering the recreation area, the Secretary shall give particular emphasis to the preservation, stabilization, and protection of cultural resources located within the recreation area in furtherance of the Archaeological Resources Protection Act of 1979, the National Historic Preservation Act, and the Act of August 11, 1978 (42 U.S.C. 1991) (commonly referred to as the "American Indian Religious Freedom Act").

(d) NATIVE AMERICANS. - (1) In recognition of the past use of portions of the recreation area by Indian peoples for traditional cultural and customary uses, the Secretary shall, subject to the provisions of section 2(n) in consultation with local tribal leaders, ensure the protection of religious and cultural sites and provide access from time to time to those sites by Indian peoples for traditional cultural and customary uses. Such access shall be consistent with the purpose and intent of the Act of August 11, 1978 (42 U.S.C. 1991) (commonly referred to as the "American Indian Religious Freedom Act"). The Secretary, in accordance with such Act, upon request of an Indian tribe or pueblo, may from time to time temporarily close to general public use one or more specific portions of the recreational area in order to protect traditional and customary uses in such portions by Indian peoples.

(2) In preparing and implementing management plans for the recreation area, the Secretary shall request that the Governor of the Pueblo of Jemez and the chief executive officers of other appropriate Indian tribes and pueblos make recommendations on methods of -

(A) assuring access to religious and cultural sites;

(B) enhancing the privacy and continuity of traditional cultural and religious activities in the recreation area; and

(C) protecting traditional cultural and religious sites in the recreation area.

(e) WILDLIFE RESOURCES. - In administering the recreation area, the Secretary shall give particular emphasis to the conservation and protection of wildlife resources, including species listed as sensitive by the Forest Service, within the recreation area and shall comply with applicable Federal and State laws relating to wildlife, including the Endangered Species Act of 1973.

(f) HUNTING. - The Secretary shall permit hunting and fishing on lands and waters under the jurisdiction of the Secretary within the recreation area in accordance with applicable Federal and State law.

(g) TIMBER HARVESTING. - The Secretary may permit timber harvesting in the recreation area for commercial purposes, including (but not limited to) vigas, latillas, the gathering of fuelwood, and for purposes of public safety, recreation, wildlife, and administration, insofar as the harvesting is compatible with the purposes of the recreation area. Trees damaged or downed due to fire, disease, or insect infestation may be utilized, salvaged, or removed from the recreation area as authorized by the Secretary in furtherance of the purposes of this Act. Nothing in this Act shall be construed to affect timber sales under contract on the date of enactment of this Act. Nothing in this Act shall be construed to affect the Los Griegos timber sale in the Los Griegos Diversity Unit number 0322 as shown on the West Half Diversity Unit map of the Santa Fe National Forest dated November 1991; except that the Secretary shall manage such sale using uneven aged management including the individual tree selection method.

(h) GRAZING. - The Secretary may permit grazing within the recreation area in accordance with regulations prescribed by the Secretary. Riparian area shall be managed in such a manner as to protect their important resource values.

(i) TRANSPORTATION PLAN. - (1) Within 1 year after the date of enactment of this Act, the Secretary shall prepare a transportation plan that provides for the most efficient use of roads and trails to accomplish the purpose of this Act. The plan shall provide for a comprehensive trails system that provides for dispersed recreation while minimizing impact on significant archaeological and religious sites.

(2) The Secretary shall construct, maintain, and close roads within the recreation area after consultation with local tribal leaders and only in accordance with such plan.

(j) RECREATIONAL FACILITIES. - The Secretary shall provide for recreational facilities within the recreation area. Such facilities shall be constructed so as to minimize impacts on the scenic beauty, the natural character, and the archaeological and religious sites of the recreation area.

(k) VISITOR FACILITIES. - The Secretary shall establish a visitor center and interpretive facilities in or near the recreation area for the purpose of providing for education relating to the interpretation of cultural and natural resources of the recreation area.

(j) **POWER TRANSMISSION LINES.** - In accordance with Federal and state laws and regulations, the Secretary may permit a utility corridor for high power electric transmission lines within the recreation area only when the Secretary determines that -

(1) there is not a feasible alternative for the location of such corridor;

(2) damage to the recreational and scenic quality and to the archaeological and religious sites of the recreation area will not be significant;

(3) it is in the public interest that such a corridor be located in the recreation area; and

(4) a plan to minimize harm to the resources of the recreation area has been developed.

(m) **SCIENTIFIC INVESTIGATIONS.** - The Secretary may permit scientific investigations within the recreation area upon the Secretary's determination that such investigations are in the public interest and area compatible with the purposes of this Act.

(n) **RESOURCE PROTECTION.** - The Secretary may designate zones where, and establish periods when, any activity otherwise permitted in the recreation area will not be permitted for reasons of public safety, administration, fish and wildlife management, protection of archaeological or cultural resources, or public use and enjoyment. Except in emergencies such designations by the Secretary shall be put into effect only after consultation with the appropriate State agencies, appropriate tribal leaders, and other affected parties.

SEC. 3. MINERALS AND MINING.

(a) **LIMITATIONS ON PATENT ISSUANCE.** - (1) Notwithstanding any other provision of law, no patents shall be issued after May 30, 1991, for any location or claim made in the recreation area under the mining laws of the United States.

(2) Notwithstanding any statute of limitations or similar restrictions otherwise applicable, any party claiming to have been deprived of any property right by enactment of paragraph (1) may file in the United States Claims Court a claim against the United States within 1 year after the date of enactment of this Act seeking compensation for such property right. The United States Claims Court shall have jurisdiction to render judgement upon any such claim in accordance with section 1491 of title 28, United States Code.

(b) **WITHDRAWAL.** - Subject to valid existing rights, after the date of enactment of this Act, lands within the recreation area withdrawn from location under the general mining laws and from the operation of the mineral leasing, geothermal leasing, and mineral material disposal laws.

(c) **RECLAMATION.** - No mining activity involving any surface disturbance of lands or waters within such area, including disturbance through subsidence, shall be permitted except in accordance with requirements imposed by the Secretary, including requirements for reasonable reclamation of disturbed lands to a visual and hydrological condition as close as practical to their premining condition.

(d) **MINING CLAIM VALIDITY REVIEW.** - The Secretary of Agriculture shall undertake and complete within 3 years after the date of enactment

of this Act an expedited program to examine all unpatented mining claims, including those for which a patent application has been filed, within the recreation area. Upon determination by the Secretary of Agriculture that the elements of a contest are present, the Secretary of the Interior shall immediately determine the validity of such claims. If a claim is determined to be invalid, the Secretary shall promptly declare the claim to be null and void.

(e) PUBLIC PURPOSES. - The Secretary may utilize mineral materials from within the recreation area for public purposes such as maintenance and construction of roads, trails, and facilities as long as such use is compatible with the purposes of the recreation area.

SEC. 4. ADJOINING LANDS.

The Secretary may evaluate lands adjoining the recreation area for possible inclusion in the recreation area and make recommendations to Congress, including (but not limited to) that area authorized for study by section 5 of Public Law 101-556 (104 Stat. 2762), known as the Baca Location Number 1. The Secretary, in consultation with local tribal leaders and the National Park Service, shall, no later than 2 years after enactment of this Act, submit recommendations with respect to future boundaries for the recreation area.

SEC. 5. ACQUISITION OF LAND.

(a) STATE LAND. - Land and interests in land within the boundaries of the recreation area that are owned by the State of New Mexico, or a political subdivision of New Mexico, may be acquired only by donation or exchange.

(b) OFFERS TO SELL. -

(1) IN GENERAL. - Subject to paragraph (2), the Secretary may acquire land and interest in land within the boundaries of the recreation area by donation, purchase with donated or appropriated funds, or exchange.

(2) LIMITATION. - The Secretary may not acquire lands within the recreation area without the consent of the owner thereof unless the Secretary has determined that such lands will be put to a use different from their use as of the date of enactment of this Act and that such new use would be incompatible with the protection of the natural and cultural resources of the recreation area.

SEC. 6. AUTHORIZATION OF APPROPRIATIONS.

There is authorized to be appropriated such sums as may be necessary to carry out the purposes of this act.

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) refers to a land classification system that categorizes National Forest land into six classes. Each class is defined by its setting and by the probable recreation experiences and activities it affords. The six classes in the spectrum are discussed in the following paragraphs.

Primitive - These areas are characterized by an essentially unmodified environment. Trails may be present. Structures, if present, are provided only for resource protection and not for visitor convenience or comfort. There is a high probability of isolation from the sight and sounds of people. Limited informational and regulatory signing; limited contact with Forest service personnel. Motorized access not provided or permitted. On a Development Scale of 1 (least) to 5 (most), primitive areas have a Development Level of 1.

Semi-primitive, non-motorized - These areas are characterized by few and/or subtle modifications by people. Rustic or rudimentary improvements are designed primarily for protection of the site rather than the comfort of the users. There is a high probability of isolation from the sights and sounds of people. Usually no more than 2 or 3 groups are within site of each other. Use of synthetic materials is avoided. Motorized access is not provided or permitted. Semi-primitive, non motorized areas have a Development Level of 2.

Semi-primitive, motorized - These areas are characterized by moderately dominant alterations by people. Primitive roads or trails are usually present. Rustic or rudimentary improvements are designed primarily for protection of the site rather than the comfort of the users. Use of synthetic materials is avoided. There is a high probability of isolation from the sights and sounds of people. Usually no more than 2 or 3 groups are within site of each other. Motorized access is provided or permitted. Semi-primitive, motorized areas have a Development Level of 2.

Roaded natural - These areas are characterized by a predominantly natural environment with evidence of moderate, permanent resource use. Improvements are designed in a contemporary/rustic style and native materials are often used in construction.

Roads maybe hard surfaced and trails are formalized. Development density usually includes more than three groups within site of each other. Primary access may be over high standard roads. Evidence of sights and sounds of people is moderate, but in harmony with the natural environment. Opportunity exists for both social interaction and moderate isolation from the sights and sounds of people. Roaded natural areas correspond with a Development Level of 3.

Rural - These areas are characterized by landscapes which have been considerably altered by the works of people. The sights and sounds of people are prevalent. More than five groups within site of each other may be encountered. Some facilities are provided strictly for the comfort and convenience of visitors. Luxury facilities are not provided. Facility design may incorporate synthetic materials. Artificial surfacing is used extensively on roads and trails. Primary access is usually over paved roads. Rural areas correspond with a Development Level of 4.

Urban - These areas are characterized by a natural setting dominated by people-made structures. The sights and sounds of people are predominate. More than five groups within site of each other may be encountered. Facilities are mostly designed for the comfort and convenience of visitors. Facilities usually include flush toilets. They may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials are commonly used in construction. Formal walk ways and surface trails are provided. Access is usually provided by high-speed highways. Designs are formalized and architecture may be contemporary. Urban areas correspond to a Development Level of 5.

Appendix C

Scenic Conditions

Existing Scenic Conditions for the Jemez National Recreation Area (JNRA) are based on an inventory using the Visual Management System (VMS) completed for the 1987 Santa Fe National Forest Plan and observations of present conditions.

Desired Conditions reflect the terminology and approach of the current Scenery Management System (SMS). Where terminology differs between the two systems, the VMS terms are shown in brackets [].

Data sources for scenic conditions include: observations of the scenic condition along the major travelways, including New Mexico State Highways (NMSH) 4, 126 and 485, Forest Roads (FR) 376 and 10; Trail 137; Visual Quality maps (VQOs) developed from the Visual Management System in 1987 and field validated for accuracy during JNRA management plan development; "A Viewshed Corridor Plan for Managing Landscape Quality for New Mexico State Highways 4 and 126", a report prepared for the Santa Fe National Forest by a landscape architect intern in 1983; and the Draft Environmental Assessment for the East Fork of the Jemez Wild and Scenic River Management Plan.

Scenic quality is analyzed within the context of **landscape character** (the overall visual impression of landscape attributes, the physical appearance of a landscape that gives it an identity and sense of place), **scenic integrity** (the amount of human caused disruption to the inherent valued character of the landscape), **constituent information** (a new element incorporated into SMS which involves the public to determine the significance of scenic quality and aesthetic experiences), and **landscape visibility** (the perceived or seen landscapes).

Landscape character is measured in terms of scenic attractiveness [variety classes], or the combination of landscape elements such as landform, water characteristics, vegetation, and cultural features.

Scenic attractiveness classifications are:

Class A--Distinctive: areas where the landscape elements combine to provide unusual, unique, or outstanding scenic quality.

Class B--Typical [Common]: areas where the landscape elements combine to provide ordinary or common scenic quality.

Class C--Indistinctive [Minimal]: areas where landscape elements have low scenic quality.

Often water and rockforms of any consequence are missing in Class C landscapes.

Landscape visibility consists of three elements: travelways and use areas, distance zones, and concern levels.

Travelways represent linear concentrations of public-viewing, including highways, roads, trails, rivers, canals, etc. Use areas are spots that receive concentrated public-viewing, such as campgrounds, trailheads, visitor centers, ski areas, and other recreation sites.

Distance Zones are divisions of a particular landscape being viewed and include: immediate foreground (0 to 300' from viewer), foreground (0 to 1/2 mile), middleground (1/2 to 4 miles), and background (4 miles to the horizon).

Concern Levels [Sensitivity Levels] are a measure of people's concern for the scenic quality of the National Forests as viewed from travelways and use areas. These ratings include: I (high), II (moderate), and III (low).

Landscape character and landscape visibility combine to reflect the relative importance and sensitivity of what is seen and perceived in the landscape. All national forest landscapes have value as scenery, some more than others. **Scenic Classes 1** through 7 are used as a measure of the value of scenery in a national forest, and are used during forest planning to compare the value of scenery with the value of other resources. Scenic Classes 1-2 have high public value, Classes 3-5 have moderate value, and Classes 6 and 7 have low value. Through the Forest planning process, Scenic Integrity Objectives [Visual Quality Objectives] are assigned to each landscape unit and are dependent upon the desired condition of each unit. These SIOs [VQOs] are described on the following page.

A variety of VQOs were inventoried in the area prior to its establishment as the JNRA, they are discussed in the text of the scenery section as existing conditions. The *goals, standards, and guidelines* section reflects the JNRA designation and makes the assumption that every acre of land within the JNRA is valued at a higher degree than lands outside the JNRA. Congressionally designated areas are generally managed for a Very High or High Scenic Integrity Objective (SIO) (**Landscape Aesthetics: A Handbook for Scenery Management**). The goal

for the JNRA will be to manage most of the area for a High SIO, but due to current development and modification of the natural environment, certain areas may be managed at less than High SIO.

Scenery Management System - Scenic Integrity Objective (desired)	
very high	Landscapes where the valued landscape character is intact with only minute, if any, deviations. The existing landscape character and sense of place is expressed at the highest possible level. This objective is usually reserved for Wildernesses or very primitive areas.
high	Landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, lie, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. This objective is usually reserved for semi-primitive areas but can also be used along scenic rural routes or areas.
medium	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
low	Landscapes where the valued landscape character appears somewhat altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. The visual characteristic of modifications must be compatible with the natural surroundings.
very low	Landscapes where the valued landscape character "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside

	the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.
unacceptably low	Landscape where the valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern or scale from the landscape character. Landscapes at this level of integrity need rehabilitation. An active or newly reclaimed mine would be an example. This level should only be used to inventory existing integrity. It must not be used as a management objective.
Visual Management System - Visual Quality Objective (existing)	
preservation	A scenic condition objective that provides for ecological change only. Management activities, except for very low scenic-impact recreation facilities, are not provided.
retention	A scenic condition objective meaning human activities are not visually evident. In retention areas, activities may only repeat attributes of form, line, color and texture found in the natural or natural-appearing landscape character.
partial retention	A scenic condition objective meaning human activities must remain visually subordinate to the attributes of the natural or natural-appearing landscape character. Activities may repeat form, line, color or texture common to these landscape characters, but changes in quality of size, number, intensity, direction, pattern, and so on, must remain visually subordinate to these landscape characters.
modification	A scenic condition objective meaning human activities may visually dominate the original natural landscape character. At the same time, vegetative and landform alterations must utilize naturally established form, line, color and texture from the surrounding landscape. Activities

	should appear as natural occurrences when viewed in foreground, middleground, and background distances.
maximum modification	A scenic condition objective meaning human activities of vegetative and landform alterations may dominate the original, natural landscape character, but should appear as natural occurrences when viewed as background.
unacceptable modification	A scenic condition level, though never an objective, where human activities of vegetative and landform alterations are excessive and totally dominate the natural or natural-appearing landscape character. Unacceptable modifications are "what not to do to any landscape", regardless of the distance from which the management activity may be observed.

Interdisciplinary Team

John Bruin	Project Coordinator
Susan Bruin	NEPA Advisor
Regis Cassidy	Vegetation Analysis
Marie DeGray	Fire/Fuels Analysis, Air Analysis
Ruth Doyle	Scenery Analysis
Kris Martinson	Social Analysis
Steve McWilliams	Soil/Water Analysis
Travis Moseley	Range Analysis, Vegetation Analysis
Phil Neff	Transportation Analysis
Juan Sanchez	Wildlife Analysis
Al Sandoval	GIS
Rita Moots Skinner	Project Coordinator, Writer/Editor, Heritage Resource and Social Analysis
Ray Suazo	GIS
Diane Tafoya	Mineral Analysis
Dennis Trujillo	Recreation Analysis