



United States  
Department of  
Agriculture

Forest  
Service

**Southwestern  
Region**



# **Draft Environmental Impact Statement for the San Diego Range Allotment**

**Jemez Ranger District, Santa Fe National  
Forest, Township 17-19 North, Range 1-3 East,  
Sandoval County, NM**



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**Draft Environmental Impact Statement  
for the  
San Diego Range Allotment  
  
Sandoval County, New Mexico**

**Lead Agency:**           **USDA Forest Service**  
Southwestern Region

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**Abstract:** The San Diego Allotment is located on the Jemez Ranger District, Santa Fe National Forest in the southwest part of the Jemez Mountains. The allotment comprises 101,817 acres with 74,114 acres of National Forest System land open to grazing. Flat mesa tops dissected by deep canyons characterize the topography with elevations ranging between 5,600 and 9,100 feet above sea level. Year-round grazing on this allotment is administered through an association term grazing permit. Currently permitted grazing is estimated at 2,493 head months per year and is considered well within the forage production of the full capacity rangeland. Four alternatives were analyzed in detail: (1) No grazing; (2) No change from current management; (3) Continue grazing and construct new improvements (i.e. facilities or developments) including fences and fence crossings, water developments, corrals, cattle guards, and pipelines; and (4) Eliminate Grazing in Holiday Pasture. Alternative 3—Continue grazing and construct new facilities—is the agency preferred alternative.

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decisionmaking process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions (*Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553 (1978)). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement (*City of Angoon v. Hodel* (9th Circuit, 1986) and *Wisconsin Heritages, Inc. v. Harris*, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980)). Comments on the draft environmental impact statement should be specific and

should address the adequacy of the statement and the merits of the alternatives discussed (40 C.F.R. 1503.3).

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**Date Comments Must Be Received:**

# Summary

The Jemez Ranger District, Santa Fe National Forest proposes to revise the grazing program on the San Diego Cattle Allotment to address archaeological (heritage resources) and other resource concerns on the allotment as well as incorporate adaptive management into the administration of the allotment. The area affected by the proposal includes lands within the former San Diego Land Grant located within the southwest portion of the Jemez Mountains. The allotment encompasses approximately 101,817 acres of which 74,114 are currently open to grazing. Elevations range between 9,100 and 5,600 feet above sea level. Vegetation is dominated by ponderosa pine and mixed conifer forests in the upper elevations, grading into piñon-juniper woodlands at lower elevations.

The Cañon de San Diego Land Grant was awarded to Francisco and Antonio Garcia de Noriega and 18 other Spanish settlers in the area in 1798. Sheep herding and cattle grazing were important economic activities within the area. Over the years, portions of the grant were sold to private individuals and in 1904, the last original grantees sold their land to the Jemez Land Company. Local families, however, kept their grazing rights on the grant and continued to graze sheep, cattle, and horses on the land. Prior to 1950, it was estimated that 7,100 sheep, 250 cattle, and 100 horses grazed the area for a total of 11,000 head months. The Forest Service purchased the land grant in 1965. Due to poor resource conditions, livestock were removed from the area between 1967 and 1972. When cattle were permitted back into the area, it was at an 80 percent reduction from historic grazing levels. Today, sheep and horses no longer are permitted to graze the allotment. Approximately 264 cattle (252 cows and 12 bulls) graze the allotment during summer months and 128 (116 cows and 12 bulls) graze in the winter months.

The 2,300-acre San Diego Wild Horse Territory was created in response to the Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195, as amended). Between 1971 and 1980, herd population estimates ranged between 5 and 25 animals. No animals have been observed since 1980. This territory is identified in the “Environmental Impact Statement for the Santa Fe National Forest Plan” (USDA-FS 1987a, pg. 102) as not viable due to the absence of wild and free roaming horses and inadequate or unsuitable forage range conditions. Therefore, the active management level for this territory is zero animals.

The Forest Service has been working with the public over the past couple of decades on issues related to cattle grazing on the San Diego Allotment. Comments and issues raised by the public have resulted in adjustments to annual operating instructions on the allotment, primarily related to restricting use in riparian pastures during summer months. Additionally, because portions of the allotment fall within the congressionally designated Jemez National Recreation Area, issues related to livestock grazing were identified through the scoping process conducted during preparation of the “Jemez National Recreation Area Environmental Assessment” and subsequently were addressed in the “Management Plan for the Jemez National Recreation Area” (USDA FS, 2002a). A Notice of Intent to prepare an EIS for the San Diego Allotment was published in the Federal Register on December 5, 2002, and on January 17, 2003, a scoping letter was distributed to 41 permittees, environmental groups, and interested individuals. Two comments were received in response to the scoping.

Consultation with Native American tribes specific to this project was initiated in 1999. Annual meetings were held with the Pueblos of Cochiti, Jemez, Santo Domingo, and Zia beginning in 1999 through 2004. Maps of the area and a description of the project were provided at the meetings. In addition to annual consultation meetings, numerous meetings have been conducted with the Pueblo of Jemez related to this particular project. The Governor of Jemez Pueblo, his

## Summary

staff, the Jemez district ranger, and the Jemez district archaeologist, as well as a member of the San Diego Cattlemen's Cooperative Association attended one or more of these meetings. Informal meetings with the San Diego Cooperative Cattlemen's Association have been held periodically throughout the process. Consultation with the U.S. Fish and Wildlife Service and the State Historic Preservation Office is ongoing.

The Forest Service identified the following significant issue during the scoping process: *Cattle grazing may damage archaeological sites*. Cattle trailing through sites, bedding down, trampling, and rubbing against standing features can result in adverse effects to sites including artifact breakage, displacement, localized erosion, and the knocking down of walls. Impacts to heritage resources are considered a significant issue due to a combination of factors, including:

- The special emphasis placed on cultural resources in portions of the area based on the Santa Fe Forest Plan (Management Areas I, P, R, and S – approximately 53 percent of the allotment);
- The recognition of the unique heritage resources in the establishment of the Jemez National Recreation Area by Congress (encompassing 31 percent of the allotment);
- The presence of 21 sites listed on the National Register of Historic Places and the determination that the majority of remaining sites are eligible to the register;
- The undisputable significance of the sites and land to the Pueblo of Jemez, as well as the high level of interest in management of the resource by the Pueblo of Jemez; and
- The nature of the sites—with many exhibiting surface artifacts and features as well as standing walls that have the potential to be affected by activities associated with cattle grazing.

Four alternatives are analyzed in this DEIS. An additional five alternatives were considered, but eliminated from detailed study for a variety of reasons. The four alternatives analyzed in detail are:

**Alternative 1 – No Grazing (No Action).** Cattle would be removed from the allotment over the next 3 years. After year three, cattle grazing would no longer be authorized on the San Diego Allotment.

**Alternative 2 – No Change from Existing Management.** Cattle grazing management would continue with no changes. No range facilities would be constructed. An average of 252 cow/calf units would be authorized from May 1 to November 30; an average of 117 adult cows would be authorized from December 1 through April 30; and an average of 12 bulls would be authorized for year-round grazing.

**Alternative 3 – Proposed Action.** The overall grazing system currently in place and the number of permitted cattle would remain essentially unchanged with an average of 252 cow/calf units authorized during the summer and fall grazing season; an average of 117 adult cows during the winter and spring grazing season; and an average of 12 bulls authorized to graze year-round. Range facilities would be constructed (including new construction and or reconstruction/maintenance of fences, pipelines, corrals, and earthen water developments) to address various archaeological, riparian, recreation, and scenery objectives.

**Alternative 4 – Eliminate Grazing in Holiday Pasture.** This alternative was developed to address the significant issue related to heritage resources. Grazing use in Holiday Pasture would be eliminated to protect a large number of heritage resources. As such, the summer grazing season would be shortened to compensate for the loss of Holiday Pasture, while the winter grazing season would be lengthened. All of Lower Virgin Pasture would be closed. Range facilities would be constructed as identified in the previous alternative to address resource objectives in the remaining pastures.

With respect to the significant issue, Alternative 1 would have no effect on heritage resources within the allotment once cattle are completely removed. Under current management (Alternative 2), grazing would be authorized in pastures containing in excess of 1,900 archaeological sites of which 21 are listed on the National Register of Historic Places. Monitoring indicated adverse effects were occurring on several sites within the allotment. It is anticipated that these effects would continue without changes in management.

Implementing mitigations as well as constructing new range improvements identified in the proposed action (Alternative 3) would address known adverse effects occurring on sites. Under this alternative a portion of Lower Virgin Pasture would be permanently closed to grazing. Cattle grazing would continue in pastures containing 1,680 sites of which 17 are listed on the National Register of Historic Places. A heritage resource specialist determined that authorized grazing would have no adverse effect on heritage resources, provided mitigation measures were implemented.

Alternative 4 was developed to offer additional protection to heritage resource sites. This alternative would implement the same mitigations as Alternative 3 as well as eliminate grazing in Holiday Pasture and all of Lower Virgin Pasture. In doing so, grazing would continue in pastures containing 1,230 sites of which 12 are listed on the National Register of Historic Places.

With respect to other resources within the allotment, while there are minor differences among alternatives, none of the alternatives would significantly affect soil, water, air, vegetation, wildlife or recreation. Eliminating grazing under Alternative 1 would result in economic consequences to members of the San Diego Cattleman's Cooperative Association.

Based upon the effects of the alternatives, the responsible official will decide whether cattle grazing will be allowed to continue on the allotment, and if so, which alternative best meets the purpose and need for the proposed action. If grazing will continue on the allotment, the decision will identify any site specific terms and conditions to be included as part of the grazing administration process.



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# Chapter 1. Purpose of and Need for Action

## Introduction

The Forest Service has prepared this DEIS (draft environmental impact statement) in compliance with NEPA (National Environmental Policy Act) and other relevant Federal and State laws and regulations. This DEIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. Supporting documentation, including detailed analyses of project area resources and interdisciplinary team meeting notes may be found in the project planning record located at the Jemez Ranger District office in Jemez Springs, New Mexico.

## Proposed Action

The Jemez Ranger District, Santa Fe National Forest proposes to continue to authorize livestock grazing on the San Diego Allotment under the following terms:

- The overall grazing system currently in place and number of permitted cattle would remain essentially unchanged with an average of 252 cow/calf units authorized during the summer and fall grazing season; an average of 117 adult cows during the winter and spring grazing season; and an average of 12 bulls authorized to graze year-round<sup>1</sup>.
- The following range facilities would be constructed to address various archaeological, riparian, recreation, and scenery objectives. They are described in greater detail in Table 1:
  - Construct one new corral in Joaquin Pasture;
  - Construct a total of 6 miles of new fence within the allotment;
  - Reconstruct 9 miles of existing fence;
  - Install one cattle guard and two fence crossings (pedestrian/equestrian accessible) along existing fences;
  - Construct nine new water developments (earthen tanks)—four in Joaquin, three in Palomares, and two in Pajarito Pastures;
  - Move two existing water troughs and extend associated, existing pipelines in Holiday Pasture; and
  - Install 3.25 miles of new pipeline and seven troughs in Schoolhouse and Porter Pastures.

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<sup>1</sup> Under adaptive management, the number of permitted cattle, season of use, and total head months can vary from year to year based on resource conditions. Forage availability, range readiness, and utilization are some of the parameters monitored to determine resource conditions. Thus, in a given year, there may be changes in the season of use, pasture rotation schedule, and number of authorized cattle. Information presented throughout this document specific to season of use, number of cattle, etc., represents an average based on average AUMs of forage available during the past decade of use. It is reasonable to anticipate a variation between 65 and 120 percent of average AUMs on an annual basis. An AUM is the amount of oven-dry forage (forage demand) required by one animal unit for a standardized period of 30 animal unit days. An animal unit is considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent. The average value for an animal unit month is 780 pounds of oven dry forage.

**Table 1. Proposed Action, Purpose and Need**

<b>Proposed Action</b>	<b>Need</b>	<b>Purpose (Objective)</b>
<b>Heritage Resources</b>		
<p>Extend pipeline and relocate two existing water sources at least one-quarter mile from ruins with standing walls in Holiday Pasture.</p>	<p>Heritage resources are being impacted from cattle using water developments that are located within heritage site boundaries. Impacts include erosion associated with cattle trailing through and congregating or bedding down within heritage sites. This increases the potential for disturbance, damage, or destruction of features and surface artifacts.</p>	<p>Protect nonrenewable heritage resources.</p>
<b>Recreation</b>		
<p>Install a cattle guard along the Joaquin and Guadalupe Pasture division fence.</p> <p>Install 2 walk-thru equestrian access crossings along existing fences in Fogon and Schoolhouse Canyons.</p>	<p>Cattle drift into high use dispersed recreation areas (Lake Fork, Cebolla, and Guadalupe Pastures) within the Jemez National Recreation Area due in part to inadequate or lack of fencing, gates left open, or cut fences in Schoolhouse and Fogon Canyons.</p>	<p>Reduce/eliminate cattle presence in high use dispersed recreation areas between Memorial Day and Labor Day.</p> <p>Minimize access problems for forest users caused by fences.</p>
<b>Riparian and Water Quality</b>		
<p>Extend drift fence about one-half mile south of Fenton Pasture.</p> <p>Construct one-half mile fence in Virgin side canyons.</p> <p>Construct 3 miles new fence along northwest edge of Schoolhouse Mesa above Rio Cebolla.</p>	<p>Cattle stray into Fenton Pasture, Virgin Canyon, and Rio Cebolla due to inadequate fencing.</p>	<p>Eliminate unauthorized use in riparian pastures.</p>
<p>Manage riparian grazing using standards developed in the Jemez National Recreation Area Management Plan as outlined in the mitigation and monitoring section.</p>	<p>Protect riparian ecosystems.</p>	<p>Continue/encourage upward trend in riparian area recovery.</p>

**Table 1. Proposed Action, Purpose and Need**

<b>Proposed Action</b>	<b>Need</b>	<b>Purpose (Objective)</b>
<b>Social and Economic</b>		
<p>Continue to authorize grazing on the allotment.</p> <p>Move existing Lower Virgin Pasture fence 1.5 miles south (adding the north portion to the Upper Virgin Pasture) and close the remaining southern portion of the pasture to grazing.</p>	<p>Cattle grazing is a traditional land use among the nine livestock operators of the San Diego community allotment. These individuals rely on cattle to promote their cultural traditions and economic well-being.</p> <p>Lower Virgin Pasture has generally not been used over the past decade due to lack of forage and water. However, recent and ongoing vegetative treatments have produced more forage in the northern portion of the pasture.</p>	<p>Contribute to the social and economic needs associated with grazing in northern New Mexico, in accordance with FS policy and Forest Plan (FSM 2202.1; Forest Plan, pp 17, 82) if ecological objectives can also be accomplished.</p> <p>It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (FSM 2203.1; 36 C.F.R. 222.2 (c)).</p>
<b>Soil</b>		
<p>Construct one-half mile of fence in Palomares Pasture to divide the pasture into a northern and southern pasture—alleviating some of the use in the southern portion.</p>	<p>Cattle congregate in the southern portion of Palomares Pasture where soil conditions are considered unsatisfactory.</p>	<p>Reduce grazing related effects to soils by reducing the amount of time cattle are in the lower portion of Palomares Pasture.</p>
<b>Grazing Systems</b>		
<p>Replace 3 miles of fence between Cebollita and Porter Pastures.</p>	<p>Cattle drift through the fence between Cebollita and Porter Pastures.</p>	<p>Eliminate cattle drifting between pastures.</p>
<p>Construct nine new water developments (stock ponds) in the Joaquin (4), Palomares (3), and Pajarito (2) Pastures.</p>	<p>During drought years, summer upland pastures have insufficient forage available for cattle grazing. While winter pastures contain high elevation forage, it is unavailable in the summer due to nonuse under the current grazing system and in the winter due to high elevation snowfall. This results in higher than desired use in some locations while others receive less than desirable use.</p>	<p>Provide flexibility for summer grazing in pastures normally receiving winter use. This will reduce grazing intensity in pastures normally used during the summer grazing season when resources use/impact thresholds are met or in response to unusual conditions such as those associated with drought or fire.</p> <p>Improve cattle distribution and bring forage utilization within desired parameters in</p>

**Table 1. Proposed Action, Purpose and Need**

<b>Proposed Action</b>	<b>Need</b>	<b>Purpose (Objective)</b>
		the Joaquin, Palomares, and Pajarito Pastures.
Construct one corral in Joaquin Pasture.	Moving and shipping cattle into and out of the Joaquin Pasture is difficult and takes more time without a holding corral.	Facilitate moving cattle to and from Joaquin Pasture.
Reconstruct 6 miles of the boundary fence between tribal and forest lands along the boundary of Pajarito Pasture.	Cattle trespass between the Forest and Zia and Jemez Pueblo tribal lands in the Pajarito Pasture through ineffective fences.	Reduce or eliminate cattle trespass between tribal and forest lands in Pajarito Pasture.
Install 3.25 miles of new pipeline and seven troughs in the Schoolhouse and Porter Pastures.	There is a lack of permanent reliable water during summer months on the mesa tops.	Provide reliable summer water sources for cattle on mesa tops.

## **Purpose and Need for Action**

The purpose and need of this proposed action is for authorization of livestock grazing in a manner that moves toward forest plan objectives and desired conditions. Authorization is needed on this allotment because:

Where consistent with other multiple use goals and objectives, there is congressional intent to allow grazing on suitable lands (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976).

The allotment contains lands identified as suitable for domestic livestock grazing in the Santa Fe National Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the forest plan (USDA-FS 1987b).

It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (FSM2203.1; 36 C.F.R. 222.2 (c)).

It is Forest Service policy to continue contributions to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1).

There is a need for change from current management as the allotment is not meeting or moving toward desired conditions in an acceptable timeframe. Specific desired conditions not being met are related to the protection of nonrenewable archaeological resources.

## Location and Setting

The San Diego Allotment is located in the southwest part of the Jemez Mountains, west of Cañon de la Canada, east of the Zia and Jemez tribal lands, south of the Cuba Ranger District and State Highway 126, and north of Jemez tribal land. The allotment comprises 101,817 acres of which 27,703 acres are closed to grazing. Areas closed to grazing consist of a mosaic of private and Forest Service lands within San Diego Canyon, around the town of La Cueva, and near Fenton Lake. Elevations range between 9,100 feet at Joaquin benchmark to 5,600 feet along the Jemez River.

Flat mesa tops dissected by deep canyons characterize the topography of the area. The allotment is dominated by ponderosa pine and mixed conifer forests in the upper elevations, grading into piñon-juniper at lower elevations. Capable areas for livestock grazing include grassland stringers and swales, upland grasslands, open ponderosa pine/mixed conifer forests, and riparian areas along the Rio Cebolla, Virgin, and Lake Fork Canyons. The remaining areas consist of heavily forested stands with little forage and/or steep slopes, unavailable to livestock.

## Decision Framework

The district ranger is the responsible official who will decide whether or not to continue to authorize livestock grazing on the San Diego Allotment and if so, under what terms.

## Forest Plan

The Santa Fe National Forest Plan provides the following management direction regarding grazing on National Forest System lands:

1. The San Diego Allotment contains lands identified as suitable for domestic livestock grazing in the Santa Fe National Forest Plan (forest plan). The project proposal and action alternatives were designed to conform to the forest plan goals, direction, and standards and guidelines, which are incorporated by reference. The Jemez National Recreation Area (Management Area X), as well as portions of Management Areas A, C, G, I, N, P, R, and S overlap this allotment.
  - **Management Area A** – Emphasis is on timber production and enhancement of wildlife habitat diversity consistent with other resource integration. Grazing capacity is generally transitory in nature but there are allotments in intermingled grasslands (USDA FS 1987b, pg 98). Less than 1 percent of the allotment overlaps this management area, primarily in the far northern portion of the allotment.
  - **Management Area C** – Emphasis is on enhancement of visual quality and developed recreation opportunities while protecting essential wildlife habitat and riparian zones. Grazing activities occur where consistent with the primary emphasis of this area (USDA FS 1987b, pg 106). Approximately 5 percent of the allotment falls within this management area, primarily in the southern portion along the Jemez River corridor. Standards and guidelines applicable to grazing include:

*Within approved allotment management plans, emphasis will be given to proper utilization of the riparian zone (USDA FS 1987b, pg. 109).*

- **Management Area G** – Emphasis in this area is on key wildlife habitat protection, habitat improvement, and forage and firewood production. Recreational opportunities are dispersed and consist of firewood and piñon nut gathering, hunting, and recreational driving (USDA FS 1987b, pg. 121). Approximately 10 percent of the allotment lies within this management area—all within Joaquin Pasture.
  - **Management Area I** – Emphasis is on providing active management of cultural (heritage) resources including protection, stabilization, interpretation, evaluation, and opportunities for research. Use restrictions will be imposed as necessary to protect the cultural values (USDA FS 1987b, pg. 135). Approximately 12 percent of the allotment lies within this management area, primarily along mesa tops. Standards and guidelines applicable to grazing include:

*Locate range structures to avoid the concentration of livestock on identified cultural resources (USDA FS 1987b, pg. 137).*
  - **Management Area N** – Emphasis is on management that protects and enhances essential wildlife habitat. Grazing may occur when consistent with the protection emphasis of this area (USDA FS 1987b, pg. 152). Approximately 1 percent of the allotment falls within this management area, located along the southern tips of Holiday and Virgin Mesa.
  - **Management Area P** – Emphasis is on cultural resource location, inventory, nomination, and protection. Emphasis is also on timber production and enhancement of wildlife habitat diversity consistent with other resource integration. Grazing capacity is transitory in nature but there are allotments in intermingled grasslands (USDA FS 1987b, pg 157). A very small portion of Lobo Pasture overlaps this management area, comprising less than 1 percent of the allotment.
  - **Management Area R** – Cultural resource location, inventory, nomination, and protection are emphasized. The emphasis is also on wildlife habitat improvement and essential habitat protection and enhancement. Grazing and timber harvest occur where compatible with the primary emphasis of this area (USDA FS 1987b, pg. 165). Approximately 38 percent of the allotment falls within this management area encompassing large portions of the upland pastures.
  - **Management Area S** - Cultural resource site location, inventory, nomination, and protection are emphasized. Emphasis in this area is also on key wildlife habitat protection, habitat improvement, forage, and firewood production (USDA FS 1987b, pg. 170). Approximately 2 percent of the allotment lies within this management area, located in the southern portion of Palomares Pasture.
  - **Management Area X (Jemez National Recreation Area)** - Emphasis is on conserving, protecting, and restoring recreational, ecological, cultural, religious, and wildlife resource values. Grazing is permitted in the Jemez National Recreation Area (Public Law 103-104). Approximately 31 percent of the allotment, primarily the travel corridors, are within this management area.
2. The forest plan allows for cattle grazing in this area where it does not impair long-term soil productivity or exceed standards such as those for forage utilization or riparian area protection.

## Public Involvement

Prior to initiation of the NEPA process, as part of ongoing public involvement, the Forest Service has been working with the public over the past decade on issues related to cattle grazing on the San Diego Allotment. Comments and issues raised by the public have resulted in adjustments to annual operating instructions on the allotment, primarily related to season of use. Additionally, because portions of the San Diego Allotment fall within the Jemez National Recreation Area, issues related to livestock grazing were identified through the scoping process conducted for the Jemez National Recreation Area and as such were addressed in the “Management Plan for the Jemez National Recreation Area” (USDA FS, 2002a).

The San Diego Allotment has been listed on the Santa Fe National Forest SOPA (Schedule of Proposed Actions) beginning in December 1998 through the present. The SOPA is distributed to interested parties and posted on the Santa Fe National Forest Web site.

A Notice of Intent to prepare an EIS was published in the Federal Register on December 5, 2002. The Notice of Intent initiates the scoping process that guides the development of the EIS. On January 17, 2003, a scoping letter was distributed to 41 permittees, environmental groups, and interested individuals. The scoping letter described the rationale for preparing an EIS and provided a copy of the information published in the Federal Register. Two comments were received in response to the scoping.

Consultation with Native American tribes specific to this project was first initiated in 1999. Annual meetings to discuss forest projects were held with the Pueblos of Cochiti, Jemez, Santo Domingo, and Zia in 1999, 2000, 2001, 2002, 2003, and 2004. The San Diego Allotment was presented as one of the ongoing analyses that the Santa Fe National Forest was working on. Maps of the area were provided at the meetings. In addition to annual consultation meetings, numerous meetings have been conducted with the Pueblo of Jemez related to this and other proposed projects. The Governor of Jemez Pueblo, his staff, the Jemez district ranger, the Jemez district archaeologist, and a member of the San Diego Cattlemen’s Cooperative Association attended one or more of these meetings.

Consultation with the U.S. Fish and Wildlife Service and the State Historic Preservation Office is ongoing. Informal meetings with the San Diego Cooperative Cattlemen’s Association have been held periodically throughout the process.

## Issues

Using comments received from the public, the Forest Service interdisciplinary team developed a list of issues to address. The interdisciplinary team grouped and sorted comments received into significant and nonsignificant issues. Significant issues were used to formulate alternatives and analyze environmental effects. Some nonsignificant issues were addressed through development of mitigation measures. Comments not considered as issues were those determined to be:

1. Outside the scope of the proposed action/purpose and need, thus irrelevant to the decision to be made;
2. Already decided (impacts avoided) by law, regulation, or other higher level decision; and/or
3. Conjectural and not supported by scientific or factual evidence.

## Significant Issue

The Forest Service identified one significant issue during the scoping process:

*Cattle grazing may damage archaeological sites.*

Cattle trailing through sites, bedding down, trampling, and rubbing against standing features can result in artifact breakage, displacement, localized erosion, and knocking down walls.

This allotment has some of the highest concentrations of significant archaeological sites in the National Forest System. Over 1,900 known archaeological sites are present, and portions of the allotment exhibit a site density in excess of 1 site every 10 acres. The highest site densities occur in Porter, Holiday, Virgin, Guadalupe, Lobo, and Palomares Pastures. For this reason, the Santa Fe Forest Plan placed 12 percent of the area under Forest Plan Management Area I—where emphasis is on providing active management of cultural (heritage) resources including protection, stabilization, interpretation, evaluation, and opportunities for research. An additional 41 percent of the area is in Management Areas P, R, and S where the primary emphasis is on cultural resources.

The importance of heritage resources in this area was also recognized by Congress in the establishment of the Jemez National Recreation Area (Management Area X, encompassing 31 percent of the allotment), where management emphasis is on conserving, protecting, and restoring recreational, ecological, cultural, religious, and wildlife resource values.

Within the allotment, 21 sites are listed on the National Register of Historic Places, and the majority of the remaining sites are considered eligible to the register. Most sites contain surface artifacts (pottery, grinding stones, obsidian flakes, etc.), and a number of sites contain standing walls or other surface features that could be affected by cattle grazing. Most of the sites within the allotment are considered ancestral to the Pueblo of Jemez. Understandably, the people of the Pueblo of Jemez feel a close tie to the sites and the land upon which they are located.

Therefore, potential impacts to heritage resources is considered a significant issue due to a combination of factors, including:

- The special emphasis placed on cultural resources in portions of the area based on the Santa Fe Forest Plan (Management Areas I, P, R, and S—approximately 53 percent of the allotment);
- The recognition of the unique heritage resources in the establishment of the Jemez National Recreation Area by Congress (encompassing 31 percent of the allotment);
- The presence of 21 sites listed on the National Register of Historic Places and the determination that the majority of remaining sites are eligible to the register;
- The undisputable significance of the sites and land to the Pueblo of Jemez, as well as the high level of interest in management of the resource by the Pueblo of Jemez; and
- The nature of the sites—with many exhibiting surface artifacts and features as well as standing walls that can be affected by activities associated with cattle grazing.

Damage can be measured through monitoring the amount of cattle presence on sites (level of congregating, bedding down, trampling) and disturbance to standing walls (rubbing against, knocking down).

## Nonsignificant Issues

The following nonsignificant issues were identified. These issues are listed and a response is provided to explain how they are currently being addressed or how they would be addressed in future management of the allotment.

*1. Cattle grazing, permittee vehicle use, and gathering and trailing of cattle may damage riparian areas. These same activities may affect water quality and aquatic habitat, particularly when combined with impacts associated with high levels of dispersed recreation use.*

Streams, springs, seeps, and wetland riparian areas occur throughout the allotment and are most prevalent in the Lake Fork, Cebolla, and Guadalupe Pastures as well as in Virgin Canyon. These areas were heavily grazed in the first part of the 20th century prior to Forest Service acquisition of the land. Dramatic recovery has occurred over the past couple of decades due to the elimination of sheep grazing, reduction of cattle numbers, and improved grazing practices. These riparian areas are highly valued by recreation users and receive a very high level of dispersed use throughout the summer.

The majority of riparian pastures on the San Diego Allotment are within the Jemez National Recreation Area. The “Jemez National Recreation Area Management Plan Environmental Assessment and Forest Plan Amendment” analyzed this issue in detail, and management direction was developed to ensure protection of riparian areas from cattle grazing and other activities. Furthermore, the ongoing “Respect the Rio” project is focusing on recreational impacts in these same riparian areas and projects are currently being implemented to protect riparian areas from dispersed recreation and localized cattle associated impacts.

*2. Cattle grazing and grazing management activities may affect wildlife, including Endangered Species Act listed or proposed Threatened and Endangered, Forest Service Sensitive, Management Indicator Species, Migratory Bird Treaty Act species, and habitats.*

Threatened and endangered species management is implemented via forest plan direction and through consultation with the U.S. Fish and Wildlife Service. Guidance criteria have been developed for determining the effect of ongoing grazing on listed or proposed threatened and endangered species and critical habitat (USDA FS, 2004c). Additionally, standards and guidelines have been established in the forest plan to manage for sensitive species and management indicator species, as well as to mitigate any negative project impacts. Effects on migratory bird species are analyzed according to guidance from the USDA FS Southwestern Regional Office. New Mexico Partners in Flight species of concern, important bird areas, and important over wintering areas are included in the analysis.

*3. Creating water sources and expanding cattle grazing into areas not presently grazed may impact wildlife and their habitat. Undisturbed areas should remain so.*

To varying degrees, the action alternatives include some facility development that would expand livestock distribution, primarily through moving cattle out of riparian areas and into upland locations, resulting in grazing in areas that formerly were grazed less or not grazed in the recent past. It is expected that broader livestock distribution and additional grazing in upland areas will have relatively minor impacts to wildlife/fish and their habitats so long as:

- Appropriate monitoring is conducted and grazing utilization standards are followed.

- Identified mitigations are effectively implemented. Scheduling grazing in individual pastures at different times in consecutive years and limiting the amount of vegetation removed by cattle would maintain adequate wildlife/fish cover and forage habitats.

*4. Fences may impede wildlife and recreation user movement and access or physically harm animals.*

Range facilities would be constructed to wildlife standards (USDI/USDA, 1988). As part of the design criteria, new fences would be constructed and/or located to minimize impacts to wildlife. Gates, ATV cattle guards or fence walk-throughs would be placed at trail crossings to allow for convenient and safe passage through fences.

*5. Competition between wild ungulates, particularly elk, and livestock for forage may result in lack of forage for other wildlife. Grazing should be permitted only if the overall condition of forage is demonstrated to be good.*

While competition between wild ungulates and livestock is a problem in some areas of the Southwest, this is not evident on the San Diego Allotment. Since 1999, a monitoring program has been implemented to determine the level of use that occurs within key areas of the allotment. These key areas are representative of the pasture from which we can monitor impacts and make necessary adjustments, if needed, to the grazing system. It is not possible to distinguish between use by wild ungulates and livestock, but use levels have generally been in the conservative level<sup>2</sup> of 30 to 40 percent utilization of key species (Moseley, 2004). Because utilization levels currently fall within this category, it can be speculated that competition is minimal. If competition indicated that forage resources were limited, then higher use levels (above 40 percent) would be observed.

*6. Cattle grazing along the Rio Guadalupe and Lake Fork Canyon (Guadalupe, Cebolla, and Lake Fork Pastures) within the Jemez National Recreation Area may affect recreational uses and scenic quality.*

Cattle are currently restricted along the Rio Guadalupe and Lake Fork Canyon during peak recreation use periods; however, cattle sometimes stray into the area through damaged fences or open gates. Although the number of recreation complaints is low, the subsequent presence of cattle in these areas can disrupt the recreational and scenic enjoyment. This concern is being addressed through the proposed action which identifies fences to be constructed or repaired to prevent cattle straying into these popular recreation areas during summer months.

*7. New fences and other range structures, depending on location and materials used, may affect scenic quality.*

Areas identified by the landscape architect as having scenic quality concerns would be avoided or construction materials would be used that are more visually pleasing.

*8. Cattle grazing and grazing management activities may conflict with upland off-road driving and other recreational uses.*

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<sup>2</sup> Holecheck and Galt (2000) define five levels of use: light to unused (0-30 percent), conservatively used (31-40 percent), moderately used (41-50 percent), heavily used (51-60 percent), and severely used (over 61 percent).

At present, the Jemez River corridor (San Diego Canyon) is closed to cattle grazing and off-road-vehicle use. Standards and guides established in the Jemez National Recreation Area management plan address off-road issues in the Rio Guadalupe and Lake Fork River corridors. This same area is currently being analyzed in the “Respect the Rio” project. Additionally, the southern portions of the mesa tops are currently closed to off-road vehicle use. The Jemez Ranger District is currently unaware of specific conflicts in this particular allotment related to grazing/permittee use conflicts with off-road recreation use.

9. *Cattle may contribute to the spread of invasive weeds.*

Cattle play a minor role in the introduction and spread of invasive weeds, rather, invasive weeds are primarily introduced by vehicles and spread by road maintenance activities, wind, and vehicle traffic. At present, the introduction and spread of invasive weeds appears to be minor on the San Diego Allotment. The Santa Fe National Forest is currently working on an EIS to address the occurrence, spread, and control of invasive weeds on the forest. Decisions to be made in the invasive weed EIS will be incorporated as needed throughout the forest.

10. *Cattle grazing is not consistent (suitable) with preservation of the integrity of the ecosystem of some areas.*

Where consistent with other multiple use goals and objectives, there is congressional intent to allow grazing on suitable lands (Multiple Use-Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, the National Forest Management Act of 1976, and the Jemez National Recreation Act of 1993). By regulation (36 C.F.R. 222.2(c)), “*Forage producing National Forest System lands will be managed for livestock grazing and the allotment management plans will be prepared consistent with land management plans.*” Suitability was determined during the analysis process and development of the Santa Fe National Forest Management Plan, and these lands were determined to be suitable for grazing.

11. *Feral, unauthorized, and/or excess cattle can be a problem within the Pajarito and Joaquin Pastures during summer months. These cattle are not permitted to graze this allotment and are removing forage otherwise allocated to permitted cattle and wildlife.*

Feral and unauthorized cattle are not permitted to graze national forest lands. The former are under the jurisdiction of the State Livestock Board and the latter are the responsibility of the owner. Removal of these cattle does not require NEPA decisions, rather their removal is purely an administrative and law enforcement matter under State laws that govern the State Livestock Board, Code of Federal Regulations and Forest Service policy. Excess cattle—those that are permitted to graze on another grazing allotment or pasture—would likewise be removed either through coordination of livestock permittees or administrative action.

12. *The construction of new range facilities and additional work imposed on the permittees (constructing and maintaining facilities) would be more costly than present operations. Those costs should be analyzed in comparison with the broader public benefits.*

This issue/concern cannot be adequately quantified or qualified because the determination of the “broader public benefits” is very subjective based on an individual’s social values and

most benefits/costs are not tangible and difficult to quantify. The cost and benefits of facilities on individual resources are discussed in Chapter 3.

A cost-benefit analysis was completed for the proposed action and alternatives relative to grazing management. The NEPA does not require an economic analysis unless economics are a significant issue or selection criteria. Nor does the NEPA require that costs that might be incurred, or income that might be generated by devoting the allotment to alternatives not associated with the proposed action and alternatives, be analyzed in detail. Federal law authorizes the use of national forest lands and resources for grazing on designated grazing allotments. Current agency regulations do not address economic issues and revenues or the cost-benefit of grazing to taxpayers and permittees.

*13. The length of the permit (10 years) is too long. Permits should be issued on a 1 to 5 year maximum basis. The terms of permits should include annual assessment of resource availability, allowing for adjustments should drought, fire, or other events alter the carrying capacity of the allotment. The issuance of grazing permits should be conditional on the existence of range monitoring.*

Forest Service policy is to issue term grazing permits for 10-year increments (Forest Service Manual, 2231.03 (1)). The term permit itself gives the Forest Service the ability to adjust annual authorized livestock numbers if it is necessary based on environmental factors, such as drought, fire, etc. (FSM-2200-10, Part 2, Subpart 8 (b) and (c)). By incorporating adaptive management, changes in number of authorized cattle, season of use, and in the overall grazing system can be made in any given year based on resource conditions. Annual adjustments are made through the development of annual operating instructions that are incorporated as part of the term permit.

*14. Livestock should be rotated through pastures—using areas for relatively short periods of time to reduce impact to resources and disturbance to wildlife. Areas should be rested in the early spring growing season.*

There are three distinct grazing systems on this allotment. The spring/summer use utilizes a deferred rotation system. This system rotates the herd through all the summer pastures, but each year a particular pasture is not used at the same time as in the previous year. On average, these pastures receive about 30 days of use per pasture. The winter range pastures can be characterized as having a season long grazing system. Cattle do not technically rotate through multiple pastures, but are instead rotated by the livestock operators to different areas of the pasture. Because forage plants are dormant during this period, no physiological factors need to be taken into consideration. However, we still try to adhere to the levels of use consistent with the conservative category to ensure that soil protection is occurring. Lastly, the riparian pastures are only used for a short period in the spring and are not grazed again until the fall at which time the forage plants are dormant.

Because this is a yearlong allotment, it is not possible to rest all areas in early spring. Those pastures that receive use during the early spring growing season have the benefit of being grazed for only 2-3 weeks in the spring, and then being rested for the remainder of the growing season. These pastures may be used during the entire growing season on a contingency basis during times of drought, fire, etc., but in most cases this would not occur.

*15. Livestock grazing can decrease plant species diversity, including structural diversity and abundance of shrubs and other woody vegetation.*

Livestock grazing can have an affect on plant species diversity, structural diversity, abundance of shrubs and other woody vegetation when it is continuous and use is heavy (60-80 percent utilization). The proposed action addresses this issue by setting allowable use at the conservative level (30-40 percent utilization) and establishing a deferred rotation grazing system. Studies indicate that conservative to moderate grazing provide for higher, or equal biodiversity compared to areas that are ungrazed (Hart, 1999, Vavra, Laycock, and Pieper, 1994, and West, 1993). Vavra, Laycock, and Pieper state “Grazing is a tool that can maintain plant succession at a certain stage thereby maintaining biological diversity.”



# Chapter 2. Alternatives Including the Proposed Action

This chapter consists of four parts. It includes a description of the four alternatives considered in detail for this project, as well as a description of alternatives considered but dropped from further study. It also includes a section on mitigation and monitoring associated with the grazing alternatives. At the end of the chapter, the alternatives are presented in comparative form, illustrating the differences between each alternative and providing a clear basis for choice among options for the decision maker.

## Alternatives Considered in Detail

The Forest Service fully developed four alternatives, including the No Action and Proposed Action alternatives.

### Alternative 1 – No Grazing (No Action)

No permitted grazing would occur in the allotment. New permits for the allotments would not be issued and cattle would be incrementally phased off the allotment over a period of 3 years. In year 1, full numbers of livestock would be authorized (unless resource conditions warrant a reduction), in year 2, 50 percent of permitted numbers would be authorized (unless resource conditions warrant a further reduction), and in year 3, no livestock would be authorized. Existing range facilities would be retained if deemed functional and if they would serve a purpose. For example, corrals may be used for equestrian recreation, and earthen water ponds, trick tanks, and pipelines may be retained to provide water for wildlife and fire suppression.

### Alternative 2 – No Change from Existing Management

The current allotment management plan would continue to guide management on the allotment. No change would be made to the current operation. No new range facilities would be constructed. Grazing would continue to be administered according to Forest Service policy. Use would be permitted year-round with cattle numbers adjusted to meet appropriate carrying capacity for summer and winter range as displayed in Table 2.

**Table 2. Alternative 2 - Permitted Grazing**

Number of Cattle	Class	From	To
252	Cow/calf	May 1	November 30
117	Adult cows	December 1	April 30
12	Bulls	Year-round	

The allotment would continue to operate under three distinct grazing systems incorporating three riparian pastures (Guadalupe, Cebolla, and Lake Fork), six summer pastures (Lake Fork Mesa, Cebollita, Schoolhouse, Porter, Upper Virgin, and Holiday), and four winter pastures (Joaquin, Pajarito, Palomares, and Lobo). Fenton Pasture would be rested to promote maximum riparian recovery. Lower Virgin Pasture would be rested due to lack of water. Virgin Canyon would be rested due to wildlife concerns. However, there would be an option to use Fenton, Lower Virgin,

and Virgin Canyon Pastures in response to unusual situations within other portions of the allotment, such as drought or wildfire. A summary of the grazing system is displayed in Table 3.

**Table 3. Alternative 2 - San Diego Grazing System**

Pastures	Grazing System	Timing of Use	Duration of Use (average)	Cattle Numbers
<b>Riparian Pastures</b>				
Guadalupe	Spring - short duration Fall - dormant season	May Nov	14 days (May) 14 days (Nov)	74 cows 74 cows
Cebolla Lake Fork	Spring - short duration Fall - dormant season	May Oct/Nov	21 days (May) 30 days (Oct/Nov)	252 cows 12 bulls
Fenton Virgin Canyon	Rest year-long (with option to use)	None	None	None
<b>Summer Pastures</b>				
Cebollita Holiday Lake Fork Mesa Porter Schoolhouse Upper Virgin	Deferred-rotation	Summer (June - Oct)	146 days total (rotating through pastures)	252 cows 12 bulls
Lower Virgin	Rest year-long (with option to use)	None	None	None
<b>Winter Pastures</b>				
Joaquin Pajarito	Continuous, season-long, dormant season	Winter (Nov - April)	136 days	74 cows
Palomares	Continuous, season-long, dormant season	Winter (Nov - April)	136 days	42 cows
Lobo	Continuous, season-long, dormant season	Winter (Nov - April)	136 days	12 bulls

**Alternative 3 – Proposed Action**

Under the proposed action, the overall grazing system currently in place and number of permitted cattle would remain essentially unchanged with an average of 252 cow/calf units authorized from May 1 to November 30; an average of 177 adult cows authorized from December 1 through April 30; and an average of 12 bulls authorized to graze year-round.

The following range facilities would be constructed to address various archaeological, riparian, recreation, and scenery objectives. They are described in greater detail in Table 1:

- Construct one new corral in Joaquin Pasture;
- Construct a total of 6 miles of new fence within the allotment;
- Reconstruct 9 miles of existing fence;
- Install one cattle guard and two fence crossings (pedestrian/equestrian accessible) along existing fences;
- Construct nine new water developments (earthen tanks)—four in Joaquin, three in Palomares, and two in Pajarito Pastures;
- Move two existing water troughs and extend associated, existing pipelines in Holiday pasture; and
- Install 3.25 miles of new pipeline and seven troughs in Schoolhouse and Porter pastures.

In general, only minor changes to the current grazing system (season of use and cattle numbers) would occur. While currently not part of the rotation, Lower Virgin and Virgin Canyon Pastures would be permanently closed; whereas under existing management they have been rested with the option of being grazed. Fenton riparian pasture would continue to be rested year-long and would be available for use on a contingency basis. Other changes would include making the Joaquin and Pajarito winter pastures available for use during summer months on a contingency basis. This alternative also differs from Alternative 2 with respect to proposed improvements (fences, water developments, etc.) developed to improve grazing management and address resource objectives.

The alternative incorporates adaptive management. Under adaptive management, the number of permitted cattle, season of use, and total head months can vary from year to year based on resource conditions. Thus, in a given year, there may be changes in the season of use, pasture rotation schedule, and number of authorized cattle. It is reasonable to anticipate a variation between 65 and 120 percent of average forage production on an annual basis. Information in Tables 4 and 5 represent normal values for season and timing of use and average values for duration of use and number of cattle.

**Table 4. Alternative 3 - Permitted Grazing**

Average Number of Cattle	Class	Season of Use
252	Cow/Calf	Summer/fall
117	Cow/Calf	Winter/Spring
12	Bull	Year-round

**Table 5. Alternative 3 - San Diego Grazing System**

Pastures	Grazing System	Average Duration of Use	Average Cattle Numbers
<b>Riparian Pastures</b>			
Guadalupe	Spring - short duration Fall - dormant season	2 weeks * 2 weeks	75 cows 75 cows
Cebolla Lake Fork	Spring - short duration Fall - dormant season	3 weeks 1 month	252 cows 12 bulls
Fenton	Rest year-long (with option to use)	None	None
Virgin Canyon	Closed		
<b>Summer Pastures</b>			
Cebollita Holiday Lake Fork Mesa Porter Schoolhouse Upper Virgin	Deferred-rotation	5 months total (rotating through pastures)	252 cows 12 bulls
Lower Virgin	Closed		
<b>Winter Pastures</b>			
Joaquin Pajarito	Continuous, season-long, dormant season	4.5 months	75 cows
Palomares	Continuous, season-long, dormant season	4.5 months	42 cows
Lobo	Continuous, season-long, dormant season	4.5 months	12 bulls

*\* Under adaptive management, duration of use in all pastures would depend on forage utilization rather than on number of days. As such, the number presented in the table is considered the average amount of use. This period could be cut short if forage utilization levels are met within a short time or, similarly, could be extended if little utilization occurs.*

### **Alternative 4 – Eliminate Grazing in Holiday Pasture**

This alternative was designed specifically to address the significant issue related to heritage resources. Grazing use in Holiday Pasture would be eliminated to protect a large number of heritage resources. Thirty days of use would primarily be shifted to Pajarito and Joaquin Pastures to compensate for the loss of 30 days in Holiday Pasture. The summer grazing season would be shortened, while the winter grazing season would lengthen. As with other alternatives, no grazing would occur in the Guadalupe, Cebolla, and Lake Fork riparian pastures between Memorial Day

and Labor Day. Holiday, Lower Virgin (the fence would not be moved south in this alternative), and Virgin Canyon Pastures would be permanently closed to grazing. Fenton Pasture would be rested, but available on a contingency basis.

Under adaptive management, the number of permitted cattle, season of use, and total head months can vary from year to year based on resource conditions. Similar to Alternative 3, in any given year, there may be changes in the season of use, pasture rotation schedule, and number of authorized cattle. It is reasonable to anticipate a variation of between 65 and 120 percent of average forage production on an annual basis. Tables 6 and 7 represent normal values for season and timing of use and average values for duration of use and number of cattle.

**Table 6. Alternative 4 - Permitted Grazing**

Average Number of Cattle	Class	Season of Use
252	Cow/Calf	Summer/Fall
117	Cow/Calf	Winter/Spring
12	Bull	Year-round

**Table 7. Alternative 4 - San Diego Grazing System**

Pastures	Grazing System	Average Duration of Use	Average Cattle Numbers
<b>Riparian Pastures</b>			
Guadalupe	Spring - short duration Fall - dormant season	2 weeks * 2 weeks	75 cows 75 cows
Cebolla Lake Fork	Spring - short duration Fall - dormant season	3 weeks 1 month	252 cows 12 bulls
Fenton	Rest year-long (with option to use)	None	None
Virgin Canyon	Closed		
<b>Summer Pastures</b>			
Cebollita Lake Fork Mesa Porter Schoolhouse Upper Virgin	Deferred-rotation	3.5 months total (rotating through pastures)	252 cows 12 bulls
Lower Virgin Holiday	Closed		

**Table 7. Alternative 4 - San Diego Grazing System**

Pastures	Grazing System	Average Duration of Use	Average Cattle Numbers
<b>Winter Pastures</b>			
Joaquin Pajarito	Continuous, season-long, dormant season	6 months	75 cows
Palomares	Continuous, season-long, dormant season	6 months	42 cows
Lobo	Continuous, season-long, dormant season	6 months	12 bulls

*\* Under adaptive management, duration of use in all pastures would depend on forage utilization rather than on number of days. As such, the number presented in the table is considered the average amount of use. This period could be cut short if forage utilization levels are met within a short time, or similarly, could be extended if little utilization occurs.*

The same proposed range facilities identified under Alternative 3 would be included under this alternative except for the following:

- The proposed pipeline extension and relocation of two water troughs in Holiday Pasture would not be implemented because no grazing would be permitted in this pasture.
- The pasture fence between Upper and Lower Virgin pastures would not be moved.

Table 8 summarizes the grazing system, pastures, and improvements proposed under the four alternatives.

**Table 8. Summary of Grazing System, Pastures, and Improvements**

	Alt. 1, No Grazing	Alt. 2, No Change	Alt. 3, Proposed Action	Alt. 4, Eliminate Holiday Pasture
<b>Cattle Management</b>				
Summer Head Months (Avg.)	0	1,857	1,857	1,597
Winter Head Months (Avg.)	0	636	636	761
Total Head Months (Avg.)	0	2,493	2,493	2,359
Summer System	N/A	Def. Rot.	Def. Rot	Def. Rot
Winter System	N/A	Season long	Season long	Season long
Summer Pastures	N/A	6	6	5
Winter Pastures	N/A	4	4	4
Riparian Pastures	N/A	3	3	3

**Table 8. Summary of Grazing System, Pastures, and Improvements**

	<b>Alt. 1, No Grazing</b>	<b>Alt. 2, No Change</b>	<b>Alt. 3, Proposed Action</b>	<b>Alt. 4, Eliminate Holiday Pasture</b>
Rested Pastures	N/A	3	1	1
Closed Pastures	16	0	2	3
<b>Facilities/Improvements</b>				
Fence Construction	N/A	0	5 miles	5 miles
Fence Reconstruction	N/A	0	9 miles	9 miles
Water Developments (earthen tanks)	N/A	0	9	9
ATV Cattle guards	N/A	0	2	2
Pipeline	N/A	0	4.25 miles	3.25 miles
Pipeline Troughs	N/A	0	9	7
Fence Walk-through	N/A	0	2	2
Corral	N/A	0	1	1

\* Includes 12 bulls

## **Alternatives Considered but Eliminated from Detailed Study**

Some public comments received in response to the proposed action provided suggestions for alternative methods of achieving the purpose and need. The following alternatives were not carried forward for detailed analysis. The alternatives are listed here with a short explanation describing why they were not analyzed in detail.

### **Increase Grazing Use in Holiday Pasture and Open Lower Virgin Pasture to Grazing**

This alternative proposed constructing additional water developments in Holiday and Lower Virgin Pastures. The water developments would allow for greater use of these areas. This alternative would result in an increase of duration of use in these pastures by the same number of cattle. The length of use would be increased in these upland pastures to relieve other pastures in drought years. This alternative was dropped for several reasons.

Although this alternative would contribute to the social and economic needs associated with traditional grazing practices in northern New Mexico, it would not meet the need for protecting nonrenewable archaeological resources and other natural resource values. Portions of Holiday and Lower Virgin pastures are located in Management Area I of the Santa Fe National Forest Plan. Forest plan direction for these areas emphasizes management for the protection of heritage

resources. Combined, these two pastures contain hundreds of heritage resource sites considered eligible to the National Register of Historic Places, eight of which are currently listed on the National Register. Locations within the two pastures continue to be used by Native Americans for traditional purposes. Increasing use in Holiday Pasture and initiating use in Lower Virgin Pasture (which currently is not being grazed) would increase the potential for cattle damage to heritage resources and/or result in interference with traditional tribal uses in the area. As such, constructing additional water developments and increasing cattle use in these areas was determined to be inconsistent with forest plan management direction for Management Area I.

### **Adjust Riparian Use, Construct Facilities, and Increase Cattle Numbers**

This alternative would be similar to the proposed action in that many of the proposed facilities would be included under this alternative; however, it would also increase cattle numbers by approximately 200 head months (25 cow/calf for 8 months) with the potential for additional increases in the future. The increases would first be allocated for existing surplus capacity within Joaquin Pasture, then as additional forage is made available, cattle numbers would be increased into additional areas. This alternative is based on the assumption that forage production will rise as a result of other, nonrelated forest management activities such as prescribed burning, thinning, and timber harvest.

This alternative was dropped from further analysis. The main difference between this and the proposed action is the increase of cattle numbers. Under current management, the capacity on this allotment is balanced with the number of cattle. There is no ecological reason to increase the number of cattle at this time. If future forest activities, such as prescribed burning and thinning, result in forage increases, the capacity for this allotment could be reassessed. Furthermore, the action alternatives provide for adaptive management, which would allow for adjustments in numbers and use based on resource conditions.

### **Control Dispersed Recreation Use Within Riparian Areas**

This alternative proposed to implement riparian restoration measures in the form of controlling dispersed recreation use. Specific actions would consist of closing certain user-created roads within the riparian areas, picking up trash, and providing alternative parking areas near Forest Road 376. This alternative does not relate to grazing activities and is out of the scope of this DEIS. However, these issues are being addressed in the “Respect the Rio” project, the purpose of which is to enhance riparian areas, restore hydrologic function of wet meadows, and improve water quality and aquatic habitat in large part through educational programs and controlling dispersed recreation use.

### **Reduction of Grazing**

This alternative proposed changing allotment boundaries for San Diego Allotment as well as other adjacent allotments. The alternative was developed to address heritage resources located in mesa top pastures and eliminate grazing in the Jemez National Recreation Area. It would result in a significant decrease in the size (acres) of the allotment, a change from a yearlong allotment to seasonal, and a decrease in the number of cattle permitted on the San Diego Allotment. Lake Fork Mesa and Fenton Pastures would be transferred to the Cebolla/San Antonio Allotment,

which lies to the north of San Diego Allotment. Grazing would no longer be authorized in the Guadalupe, Cebolla, Lake Fork, Cebollita, Porter, Schoolhouse, Holiday, Upper Virgin, Lower Virgin, Palomares, and Lobo Pastures. The Pajarito and Joaquin Pastures would be the only remaining pastures on the San Diego Allotment. These pastures would be made available on a seasonal basis or yearlong with lower numbers.

This alternative was dropped from further analysis for several reasons. With respect to heritage resources, Alternative 1 (no grazing) and Alternative 4 (eliminate grazing in Holiday Pasture) were developed to address the heritage issue. Related to grazing in the Jemez National Recreation Area, Alternative 1 (no grazing) would eliminate grazing in the recreation area. Making changes to an adjacent allotment (adding pastures to Cebolla/San Antonio Allotment) was considered outside the scope of this analysis. Furthermore, reducing the San Diego Allotment to two pastures would effectively put the permittees on this allotment out of business, which would have the same effect as the no grazing alternative and would not contribute to the social and economic needs associated with traditional grazing practices in Northern New Mexico.

### **Eliminate Grazing in Riparian Pastures**

This alternative proposed eliminating grazing in riparian pastures (Guadalupe, Cebolla and Lake Fork). No scheduled use would occur in the riparian areas, however, cattle would be permitted to trail through the pastures as they move between summer and winter pastures. Implementation of this alternative would result in a reduction of 361 head months. The alternative was developed in response to issues originally raised through scoping related to the Jemez National Recreation Area NEPA analysis. As such, it was analyzed in detail in the Jemez National Recreation Area Management Plan Environmental Assessment and Forest Plan Amendment (USDA FS, 2002a). The analysis indicated that riparian areas were being protected as required in the Jemez National Recreation Area Act. Furthermore, the mitigations and monitoring requirements presented in the Jemez National Recreation Area management plan will be incorporated into management of the San Diego Allotment.

## **Mitigation Measures and Monitoring Requirements**

The mitigation measures and monitoring requirements listed here will be implemented in addition to those required for compliance with laws, regulations, Forest Service directives and forest plan standards and guidelines. District resource specialists are responsible for ensuring that mitigation measures are implemented and for monitoring and evaluating how well the measures are resolving the identified problems and meeting project objectives.

Monitoring information will be used to confirm that allotment objectives are being achieved and to identify the corrective measures required to meet those objectives. If necessary, management techniques will be changed to more effectively achieve allotment objectives (adaptive management). Adaptive management techniques may include, but are not limited to adjusting: numbers, timing, duration, intensity of cattle use, salt locations, fences, water developments, and/or creation of additional or higher quality forage.

To minimize resource impacts, implementation of the following mitigation measures and monitoring is required under all action alternatives. The mitigation measures included here are limited to those for which the Forest Service has authority. These mitigation measures have been

used on previous projects and are considered to be effective in reducing environmental impacts. With full implementation of applicable forest plan standards and guidelines, project design criteria, and the prescribed mitigation measures, no potentially significant adverse environmental effects are expected to occur under the action alternatives.

### **Vegetation**

The objective is to minimize impacts from cattle grazing on riparian and upland vegetation:

- Key herbaceous riparian vegetation, will have a minimum stubble height of 4 inches on the streambank, along the green line, after the growing season and during spring runoff;
- Key riparian browse vegetation will not be used at levels exceeding 50 percent of the current annual twig growth that is within reach of the animals;
- Key herbaceous riparian vegetation on riparian areas, other than the streambanks, will not be grazed more than 30 percent during the growing season or 60 percent during the dormant season;
- Streambank instability attributable to grazing livestock will be less than 10 percent on a stream segment; and
- Upland range resource values will be protected from unacceptable grazing effects as determined through utilization monitoring. Livestock grazing will be managed at a level corresponding to conservative intensity. Conservative grazing intensity for rangelands in New Mexico has been defined as utilization levels between 31 and 40 percent (Holechek and Galt, 2000). In addition, minimal acceptable stubble heights have been developed by the Forest Service for certain species. Residual plant material should not be reduced below those levels.

### **Water**

The objective is to minimize impacts to water quality from cattle grazing and range facility construction:

- Unprotected or newly restored (as a result of vegetation treatments such as prescribed fire) springs will be monitored to determine if they are being impacted by cattle use. If springs are being impacted, actions such as constructing fences will be implemented to exclude cattle from these areas.
- Springs and seeps that receive moderate to high cattle use will be fenced for protection.
- A salting plan will be developed that minimizes impacts to riparian zones, meadow ecosystems, and other forest resources (USDA FS 1987b, pg. 68). Salting locations will vary annually and will not be located within one-half mile of water sources.

### **Wildlife**

The objective is to minimize impacts to wildlife and plants from continued cattle grazing as well as minimize impacts associated with the construction and location of range facilities:

- Allotment fences will meet wildlife standards to allow easy migration and passage (USDA FS 1987b, pg. 67). Fences and loose wire will be removed as they are abandoned (USDA FS, 1987b, pg. 66).

- Nongame entrance and escape ramps will be provided on all water developments intended for livestock and wildlife use (USDA FSb, 1987, pg. 66). Existing water developments will be inspected to ensure escape ramps are present as needed. New and reconstructed water developments will include wildlife access, cover, and escape considerations (USDA FS 1987b, pg. 67).
- Maintenance of range facilities will be evaluated and conducted to have no adverse effect on threatened and endangered species (USDA FS 1987b, pg. 68). If any listed or proposed threatened, endangered, or sensitive species are found during project activities, work in the immediate vicinity of the sighting will stop until a Forest Service wildlife biologist has resurveyed the area and any new recommended mitigation measures have been employed.
- Forage use by grazing ungulates will be maintained at or above a condition which assures recovery and continued existence of threatened and endangered species (USDA FS 1987b, pg. 10).
- In mountain meadows (subject to seasonal livestock use between May and October) which are owl foraging areas, livestock grazing will be at a level that maintains a minimum cover height of 4.5 inches of herbaceous vegetation to provide cover for the owls' prey species (standard will be met 10 days after the onset of summer rains or August 1, whichever comes first, and maintained through the end of the growing season) (USDA FS 2004, pg. 69).
- Construction of facilities (fences, corrals, tanks, etc.) within potential northern goshawk habitat will not occur during nesting season (March 1 through September 30). However, if a goshawk survey is conducted and there is negative response, construction may occur during this period.

### **Heritage Resources**

The objective is to protect heritage resources from direct or indirect impacts caused by ground-disturbing activities associated with the construction of range facilities and to monitor the effects of cattle grazing on sites to ensure significant adverse effects are not occurring:

- Implement site specific mitigations and monitoring as outlined in Appendix A. If monitoring data indicate continued grazing effects on sites, actions will be taken to mitigate the effects. These actions include, but are not limited to: changing grazing season of use, constructing drift fences, directly fencing site boundaries, or dropping vegetation to deter cattle access.
- Range structures will be located to avoid the concentration of livestock on identified cultural resources (USDA FS 1987b, pg. 137).
- No salting will occur within or immediately adjacent to known site boundaries.
- Existing facilities (water tanks, fences, corrals, etc.) will be periodically inspected to ensure no effects are occurring to heritage sites located in the general vicinity.
- An archaeologist will monitor ground-disturbing activities during excavation of the trench for the proposed new pipeline in Schoolhouse and Porter Pastures. An archaeologist will also be present during removal of water troughs within the National Register site located on Holiday Mesa and will field inspect the new trough locations to ensure no sites are impacted.

- If any unrecorded sites are discovered during the course of constructing or maintaining range facilities, all ground-disturbing activities in the vicinity of the site(s) will cease and the district or forest archaeologist will be notified.

**Recreation/Scenery**

The objective is to reduce encounters between recreation users and cattle and minimize impacts to scenic quality in popular recreation areas and along major travel corridors.

- Range facilities within high use recreation areas will be located, constructed and maintained to minimize disruption to the visual corridor. Native or natural appearing materials will be used where appropriate.
- The effect of fences and other range structures on recreation travel will be minimized (USDA FS 1987b, pg. 122) by installing fence crossings or cattle guards as needed.

**Comparison of Alternatives**

This section provides a summary of the effects of implementing each alternative, to provide decision makers and the public a clear basis for choice. The table summarizes the more detailed effects analysis descriptions contained in Environmental Consequences, Chapter 3.

**Table 9. Comparison of Effects by Alternative**

	<b>Alt. 1, No Grazing</b>	<b>Alt. 2, No Change</b>	<b>Alt. 3, Proposed Action</b>	<b>Alt. 4, Eliminate Holiday Pasture</b>
<b>Project Purpose and Need</b>				
Protect nonrenewable heritage resources from the effects of cattle grazing (significant issue)	<p>Within 3 years, no cattle grazing would be permitted on sites.</p> <p>There would be no effect to sites on the allotment.</p>	<p>Grazing would be permitted on 1,900 sites including 21 sites listed on the NRHP.</p> <p>Adverse effects identified through previous monitoring would continue on 17 of the 1,900 sites.</p>	<p>Grazing would be permitted on 1,680 sites including 17 sites listed on the NRHP.</p> <p>Adverse effects identified through previous monitoring on 17 sites would be mitigated.</p>	<p>Grazing would be permitted on 1,230 sites including 12 sites listed on the NRHP.</p> <p>Adverse effects identified through previous monitoring on 17 sites would be mitigated.</p>
Contribute to social and economic needs in northern New Mexico	Would not contribute to social and economic needs.	Would contribute to the social and economic needs in northern New Mexico with respect to cattle grazing.		

**Table 9. Comparison of Effects by Alternative**

	<b>Alt. 1, No Grazing</b>	<b>Alt. 2, No Change</b>	<b>Alt. 3, Proposed Action</b>	<b>Alt. 4, Eliminate Holiday Pasture</b>
<b>Project Objectives</b>				
Reduce/eliminate cattle presence in high use dispersed recreation areas	Within 3 years, no cattle grazing would be permitted on the allotment.	Cattle would continue to drift into high use dispersed recreation areas through open gates and cut or damaged fences.	Installation of fence walk-through stiles, cattle guards, and fence maintenance would reduce occurrence of cattle drifting into high use recreation areas.	
Minimize access problems for forest users caused by fences	As cattle are removed from the allotment, interior fences would no longer be necessary.	Fences above Fogon and Virgin Canyons would continue to inhibit recreation access.	Walk-through stiles along fences above Fogon and Virgin Canyons would minimize access problems for forest users.	
Eliminate unauthorized use in riparian areas	As cattle are removed from the allotment, unauthorized cattle use in riparian areas caused by cattle drifting through open gates and cut or damaged fences would cease.	Cattle would continue to access riparian areas through open gates and cut or damaged fences.	Walk-through stiles along fences above Fogon and Virgin Canyons would allow recreation users easy passage and reduce or eliminate incidents of fences being cut and/or gates left open which result in cattle drifting into riparian areas during unauthorized periods.	
Continue/encourage upward trend in riparian area recovery	Within 3 years, in the absence of grazing, an upward trend in riparian areas would occur unimpeded by cattle use.	Riparian area grazing would be managed using standards developed in the Jemez National Recreation Area plan. Managing in this way would continue and encourage an upward trend in riparian area recovery.		

**Table 9. Comparison of Effects by Alternative**

	<b>Alt. 1, No Grazing</b>	<b>Alt. 2, No Change</b>	<b>Alt. 3, Proposed Action</b>	<b>Alt. 4, Eliminate Holiday Pasture</b>
Eliminate cattle drifting between pastures	Within 3 years, no cattle grazing would be permitted – thus there would be no drifting between pastures.	Until repairs are made, cattle would periodically drift between Cebollita and Porter Pastures due to the existing fence being in poor condition.	Reconstruction of the fence between Cebollita and Porter Pastures would eliminate cattle drifting between these pastures.	
Provide flexibility for summer grazing in winter pastures	N/A	Due to lack of water developments, there would be little flexibility to use winter pastures in summer months.	Construction of water developments in three winter pastures would provide for flexibility to use these pastures in summer months.	
Improve cattle distribution and utilization	N/A	Cattle would continue to concentrate in portions of winter pastures due to lack of water developments.	Construction of water developments in three winter pastures would provide for more even distribution of cattle.	
Facilitate moving cattle to and from Joaquin Pasture	N/A	Permittees would continue to move cattle from summer to winter pastures without use of a corral.	Construction of a corral in the Joaquin Pasture would facilitate moving cattle in and out of the area.	
Eliminate unauthorized cattle movement between tribal and forest lands	Cattle would be removed from the allotment; unauthorized use on the forest by tribal cattle may still occur due to inadequate boundary fences.	Unauthorized use by cattle would continue to occur on forest and tribal lands due to inadequate boundary fencing.	Reconstruction of allotment boundary fencing would reduce or eliminate unauthorized use by cattle on tribal and forest lands.	

# Chapter 3. Affected Environment and Environmental Consequences

This section describes the physical, biological, social and economical environmental effects of implementing the proposed action and the potential changes to those environments due to implementation of the alternatives. This analysis is organized by resource. Within each section, the affected environment is briefly described followed by the effects (direct, indirect, and cumulative) of each alternative. The No Action Alternative provides a baseline for evaluation and comparison of the action alternatives.

## Past, Present, and Foreseeable Future Actions

Cumulative effects are incremental and additive effects from other activities that add to the effects of the management alternatives analyzed in this DEIS. In assessing cumulative effects, the interdisciplinary team considered past, present, and reasonable foreseeable future land use activities on Federal and non-Federal lands within and surrounding the project area. Foreseeable future activities only include those that have been proposed for NEPA analysis in the near future, or a NEPA decision has already approved implementation of the action. Other possible future actions were considered too speculative to include in the cumulative effects analysis.

### Vegetation Management

Some of the heaviest timber harvesting activity in the Jemez Mountains occurred in the first half of the 20<sup>th</sup> century on the San Diego Land Grant when it was under private ownership (The Forest Service acquired the land in the late 1960s). Logging occurred on the mesa tops (Virgin, Holiday, Stable and Schoolhouse Mesas) and along the Rio Guadalupe. An old railroad grade, the old town site of Porter, and the remains of the Gilman Mill are remnants of this historic logging along the river. Historic logging camps and scattered associated cabins are also present on the mesa tops.

In the mid 1990s the Peggy and Guadalupe Timber Sales were conducted in the western portion of the allotment. Following these sales, the areas were open for public (permitted) firewood gathering. In the late 1990s, thinning projects were initiated on Schoolhouse and Virgin Mesas. Thinning is continuing on Virgin Mesa with the intent of creating a firebreak to protect the community of Jemez Springs and several summer camps along San Diego Canyon located below Virgin Mesa. The thinning project is targeting dense, close growing, small diameter trees (generally under 9 inches in diameter) from the understory with the intent to retain mature trees. This project will be expanded in the future to include additional portions of Virgin Mesa as well as the southern portion of Holiday Mesa and Stable Mesa.

Ongoing and future thinning is also occurring in the vicinity of Paliza Campground (Lobo Pasture) and in the piñon-juniper woodlands along the southern portion of the allotment in the Coyote Flats area (Pajarito Pasture). Salvage logging following the 2002 Lakes wildfire occurred in a unit located south of Lake Fork Mesa along Forest Road 376.

### Water and Riparian Management

In 1999, the Jemez District began a 5-year project to remove invasive plants within the Jemez National Recreation Area along the Lower Jemez River and Rio Guadalupe. Several methods are

being used (thinning, grubbing, and use of herbicides) to control the spread of invasive salt cedar and Russian olive.

The “Respect the Rio” project encompasses the areas in and surrounding the Rio Cebolla and Rio Guadalupe within the San Diego Allotment. The project focus is on managing dispersed recreation use along the river corridors by obliterating user-created roads along streams and in riparian areas, and designating where people can park and drive. A large portion of this project includes education through face-to-face contacts, developing brochures, installing fences and other barriers, providing information in kiosks, and creating an aquatic display at the Walatowa Visitor Center. Heavily impacted areas will be rehabilitated through reseeding, planting willows, and stabilizing streambanks.

### **Wildlife and Fish Management**

Numerous wildlife species are present within the San Diego Allotment (refer to *Wildlife Affected Environment* section). While there are restrictions related to use of firearms in the vicinity of roads and recreation sites, hunting of bear, mountain lion, deer, elk, turkey, and other small game and waterfowl is permitted in nondeveloped areas. The allotment falls within Big Game Management Unit 6A. Hunting will continue to be permitted in future years. A limited amount of elk hunting also occurs on the nearby Valles Caldera National Preserve. A number of wildlife and livestock umbrella tanks (i.e. trick tanks) are present in the allotment and are maintained on a regular basis.

Fish structures have been placed in several of the streams within the allotment. Six fishing pads and structures were constructed in the early 1990s along the Jemez River as part of the Lower Jemez recreation developments. Log stream structures dating to the 1930s and fence post debris catchments dating to the 1960s were placed along the Rio Cebolla and San Antonio Creek. Many of the older structures were initially effective but have since had negative effects on stream channel dynamics. Currently, Rio Cebolla and Rio Guadalupe are being considered for potential reintroduction of Rio Grande cutthroat trout. The mouth of the Rio de las Vacas near Porter is being restored with flood plain and stream habitat structures.

### **Recreation Management**

Much of the Jemez National Recreation Area is within the San Diego Allotment; however, not all of the area is open to grazing. For example, the entire Jemez River corridor is closed to grazing. Visitation in the area is estimated to have increased approximately 30 percent over the past 10 years, based on the average population growth for Bernalillo, Sandoval, Los Alamos, and Santa Fe Counties (U.S. Census Bureau, 1990 and 2000). Briefly, recreational activities include but are not limited to camping, fishing, picnicking, hiking, sightseeing, swimming, mountain biking, and horseback riding. Winter activities include cross-country skiing, snowmobiling and snow play. There are no developed trails in the San Diego Allotment. The Rio Guadalupe corridor is a popular dispersed camping area. Developed recreation sites occur along the Jemez River corridor but these areas are closed to grazing. Reconstruction of Paliza Group and family campgrounds (within the Lobo winter pasture) is scheduled for 2004-2005. Reconstruction plans include fencing the campgrounds to keep the 12 authorized bulls in Lobo Pasture during winter months out of the campground.

## **Wild and Prescribed Fire Management**

Within the San Diego Allotment, many wildfires are reported and suppressed prior to growing into large acreage fires. These wildfires are often the result of lightning strikes or are human caused. Large fires include: the Cebollita Fire that burned 270 acres on the mesa tops above La Cueva in the 1970s; the Porter Fire that burned 1,700 acres on Stable Mesa in 1977 – 1,000 acres were subsequently replanted with ponderosa pine seedlings; a second Porter Fire that burned 380 acres west of Forest Road 376 near Porter in 1993; and a fire burned in Schoolhouse Canyon near the confluence with Rio Guadalupe and Porter in 1999. The Lakes Fire (August 2002) burned 3,900 acres near Fenton Lake and along a portion of Forest Road 376 and State Highway 126. Most recently (June 2003), the Virgin Fire burned 400 acres on Virgin Mesa.

An active prescribed burning program has been in place for the past decade. The 16,000-acre Buchanan Prescribed Burn occurred in 1993 and overlaps the southwest portion of the allotment. Located along the eastern boundary of the allotment (Palomares Pasture), the 6,000-acre San Juan Prescribed Burn occurred in 1998 with portions being reburned in fall 2003 and Spring 2004. Additional burning is scheduled along San Juan Mesa in Fall 2004. The 6,200-acre Stable Prescribed Burn occurred in 1999 along Stable Mesa. Other prescribed burning, generally consisting of burning slash piles, has occurred throughout the allotment in former timber sale areas.

## **Roads Management**

State Highways 126 and 4 are located within the allotment. Numerous forest roads access various portions of the allotment. The majority of roads were constructed prior to Forest Service acquisition of the San Diego Land Grant and were likely constructed to support logging. Forest Road 376 along the Rio Guadalupe follows the alignment of an old logging railroad. Excluding the highways, most of the roads within the San Diego Allotment are closed during the winter months and no road access is provided to the mesa tops in the winter. Foreseeable future road management activities involve decommissioning 89 miles of road (e.g. restore vegetation), and closing 23 miles of road (e.g. barrier or gate), as suggested in the Jemez National Recreation Area Transportation Plan. These roads are primarily located along river corridors within the San Diego Allotment. The Santa Fe National Forest is currently working on a forest-wide roads analysis process. In 2005, the Jemez Ranger District is scheduled to begin assessing roads as part of this forest-wide effort. This assessment will include recommendations for roads to be maintained, closed, or decommissioned on the ranger district.

## **Livestock Grazing**

The San Diego Land Grant (encompassing the San Diego Allotment) was acquired in the late 1960s by the Santa Fe National Forest. Prior to acquisition, both sheep and cattle heavily grazed the area. A range survey conducted shortly after acquisition indicated the land had been badly abused and livestock grazing was subsequently eliminated from the area between 1967-1972. When cattle were permitted back into the area, it was at an 80 percent reduction from historic levels and sheep were no longer permitted. In addition to reduced numbers, numerous range facilities have been constructed on the allotment making more area available for grazing. An extensive pipeline system, fences for pasture creation, and implementation of a rotational grazing system have all improved the management and condition of the allotment.

## Free Roaming Wild Horses

The 2,300-acre San Diego Wild Horse Territory was created in response to The Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195, as amended). Herd population estimates ranged between 5 and 25 animals from 1971 through 1980. There have been no animals observed since 1980. This territory is identified in the “Environmental Impact Statement for the Santa Fe National Forest Plan” (USDA FS 1987a, pg. 102) as not viable due to the absence of wild and free roaming horses and inadequate or unsuitable forage and range conditions. Therefore, the active management level for this territory is zero animals.

## Special Uses

Power and telephone lines, buried along State highway easements, are under permit to Jemez Mountain Electric Coop and Valor Telecommunications. Overhead power and telephone lines serve several of the communities in the Jemez Mountains and cross through the San Diego Allotment. Maintenance and repair of these utility and communication lines is anticipated to continue into the future. Los Alamos National Labs manages a worksite on Fenton Hill that was once designated as a geothermal research facility (Hot Dry Rocks site). They currently oversee an astronomy research site on Fenton Hill (Milagro Facility).

## Private Lands

The communities of La Cueva, Horseshoe Springs, Jemez Springs, Cañon, and Gilman are within the boundary of the San Diego Allotment. Residents from these areas frequently use the forest for a variety of recreational and subsistence activities. Private lands are currently being developed along the Jemez River and are likely to continue to be developed for residential use at some point in the future.

## Soil and Vegetation

### Affected Environment

Flat mesa tops dissected by deep canyons characterize the topography of the San Diego Allotment. Soils in the San Diego Allotment developed primarily from Bandelier tuff parent material. These soils are relatively shallow, have low infiltration and influence runoff amount and timing of peak flows. Soil condition is interpreted using three characteristics: nutrient cycling, stability and hydrologic function. A terrestrial ecosystem survey (TES) on the Santa Fe National Forest rated soil condition primarily using soil stability and the universal soil loss equation (USDA FS 1993). Soils were subsequently categorized as satisfactory, impaired, or unsatisfactory.

A **satisfactory** soil condition rating indicates that past and current management have allowed the soil to function properly and retain its inherent productivity.

An **impaired** soil condition rating indicates that management activities have reduced the soil’s ability to function normally. Impaired soils have an annual soil loss in excess of tolerance (equivalent to the depth of soil generated annually) but less than potential (loss predicted to occur following a catastrophic fire). Causes of accelerated erosion can include disturbance of

vegetative cover or surface by humans, livestock, wildlife, low to moderate severity wildfires, landslides, and extreme rainfall. This rating is also given to dense piñon/juniper vegetation types that support minimal herbaceous cover, such as along the southern portions of the Pajarito and Palomares Pastures.

An **unsatisfactory** soil condition rating indicates that management activities have resulted in a loss of soil function. Generally, these soils have degraded so far that they are not likely to recover in a timely manner, even rested from use, without substantial restoration measures. Soil conditions on the San Diego Allotment are rated in Table 10.

**Table 10. Soil Condition on the San Diego Allotment**

Condition Class	Percent of Allotment
Satisfactory	76
Impaired	22
Unsatisfactory	1

There are 48 TES map units within the project area. Based on TES map units, soil loss rates in the allotment indicate fairly stable soils, with acceptable movement rates that are well below tolerance levels for these soil types. However, map units 64, 127, 169, 187, 344, 623, and 649 are listed as impaired, indicating soil loss is exceeding tolerance levels. With the exception of TES Unit 64, a review of the location of units indicates this rating can be primarily attributed to the landform where it occurs (steep, scarp slopes).

TES Map Unit 64 is within the Palomares and Pajarito Pastures, and in this situation, the landform does not appear to be the reason for the impaired rating, rather, a reduction in vegetative ground cover has led to erosion. Management activities over the past 100 years (fire suppression, timber harvesting, and grazing) have cumulatively altered the tree species makeup, density, and distribution. The lack of natural forest fires, coupled with historic uses (including heavy grazing and timber harvesting) has changed vegetation patterns. Piñon/juniper savannahs are being lost to tree invasion. The understory plants are suffering due to closed canopies. Loss of understory plant cover influences forage availability and may contribute to changing hydrologic patterns. As mentioned, lack of ground cover vegetation in the piñon/juniper and lower elevation ponderosa pine along the southern ends of Palomares and Pajarito Pastures is contributing to erosion. Another factor within these pastures is the presence of roads. Roads, in conjunction with the effects of increased densities of trees, are the main contributing factors to the erosion that is occurring within these pastures. An onsite inspection of Pajarito Pasture in May 2003 indicated that cattle had very little, if any, impact on the soil resource (Padilla, personal observation). Limiting the allowable use to light use of key species (2.5 inches or more stubble left on blue grama) along with reduced winter numbers, and the proposed additional fencing in Palomares Pasture should mitigate the potential effects associated with grazing within TES Unit 64.

Hydrologic function is the ability for water to infiltrate soil. This function is impaired when there is a loss of vegetative ground cover and soil compaction. Hydrologic function is adequate in most of the allotment, with riparian areas being the exception. Impacts from past cattle grazing, recreation use, and roads have led to soil compaction, reduced infiltration and increased runoff.

Impaired nutrient cycling is primarily the result of loss of vegetative ground cover and is primarily found in riparian areas; vegetative ground cover as described in the TES and current conditions is satisfactory on uplands within the watershed. Changes in plant species, compaction and utilization in riparian areas due to past livestock grazing practices and recreation has reduced nutrient cycling in riparian areas.

Vegetation is defined by elevation with ponderosa pine/mixed conifer forests at higher elevations and piñon/juniper woodlands present at lower elevations.

**Table 11. Vegetation Types on San Diego Allotment**

Vegetation Type	Percent
Piñon/Juniper	42
Ponderosa Pine	40
White Fir	8
Douglas Fir	4
Riparian	3
Oak Woodland	1
Grassland	1
Aspen(Birch)	<1
Juniper Woodland	<1

The key forage species grazed by cattle include Kentucky bluegrass, mountain muhly, and Arizona fescue in the higher elevations and blue grama and western wheatgrass in the lower elevations. Grasses on the allotment vary in the season of growth with a combination of cool and warm season growers. The current production of forage vegetation ranges between 50-3,000 lbs. per acre (Moseley, 2004).

Common to all alternatives – key utilization standards are defined as 40 percent utilization on satisfactory range condition and 25 percent on unsatisfactory range condition (Holechek et al., 1989). Key areas are identified in the allotment management plan and annual operating instructions. Key species for the San Diego Grazing Allotment are western wheat (*Elymus smithii*) and blue grama (*Bouteloua gracilis*) in the lower elevations, and mountain muhly (*Muhlenbergia montanus*), Kentucky bluegrass (*Poa pratensis*), and Arizona fescue (*Festuca arizonica*) in the higher elevations. Stubble height guidelines developed by the Forest Service for lands in New Mexico are the measures that will be used to determine compliance with the standards.

The grazing capability of a land area is dependent upon the interrelationship between soils, plants, and animals. **Fully capable** areas are those that can be used by grazing animals under proper management without long-term damage to soil resources or plant communities. Typically, the land is stable and vegetative ground cover maintains site productivity. **Potentially capable** areas could be used for grazing animals under proper management, but range facilities are not adequate under existing conditions to obtain the necessary animal distribution. Areas designated as **not capable** are those that cannot be used by cattle without long-term damage to soils or plant

communities, or are barren or unproductive naturally (USDA FS, 1997). Table 12 identifies range capability on the San Diego Allotment.

**Table 12. Range Capability on San Diego Allotment**

Fully	Potentially	Not	Closed
43%	7%	23%	27%

Of the fully capable range on the San Diego Allotment, approximately 63 percent is considered satisfactory. Satisfactory is defined in Table 13 as falling into one of several categories. Satisfactory conditions exist when trend is upward and/or range condition is fair to good. The remaining 37 percent is in unsatisfactory condition where the trend is downward and/or the range is in fair to poor condition. As discussed, range utilization limits have been established at 25 percent or below in the unsatisfactory condition areas. Higher than normal minimum stubble height guidelines will be developed for specific sites as necessary.

**Table 13. Range Condition and Trend**

Trend	Condition		
	Poor	Fair	Good
Upward	Satisfactory	Satisfactory	Satisfactory
Static	Unsatisfactory	Satisfactory to Unsatisfactory	Satisfactory
Downward	Unsatisfactory	Unsatisfactory	Unsatisfactory

Invasive plant species are present within the allotment. Musk thistle occurs along Forest Road 376 just below the Rio Cebolla stream crossing. This population was discovered in 1998 and partially treated by grubbing. Approximately 50 acres were grubbed in 1999. It occurs along with Canada and bull thistle along the road and into the riparian zone. Russian knapweed occurs on Forest Road 604, 1.4 miles from the Forest Road 376 junction. This patch is relatively small (< 1/2 ac.) and low density. Russian olive, Siberian elm, and salt cedar occur at various densities along most riparian zones on the Jemez Ranger District. One known population within the allotment boundary occurs along the lower Rio Guadalupe. To address issues related to invasive plants and under a separate analysis process, a draft EIS for invasive plant control on the Carson and Santa Fe National Forests was distributed to the public in June 2004.

## Environmental Consequences

**Alternative 1** – Under the no grazing alternative, cattle would not drift between pastures and there would be no need to provide flexibility for summer grazing in winter pastures or to improve distribution or facilitate movement of cattle with a new corral in Joaquin Pasture. There would be no need to provide permanent water sources on the mesa tops. With respect to unauthorized cattle use on forest and tribal lands, there would be potential for tribal cattle to access forest lands through ineffective fencing, but not vice-versa.

With respect to vegetative resources, it is predicted that there would be very little difference in the condition of vegetation as compared to the grazed situation. This is due to the fact that proposed utilization standards limit the amount of vegetation that can be removed by cattle under all action alternatives. The standards are set at the conservative use level, i.e. 30-40 percent use of the current year's growth (Holechek and Galt, pp. 11-14. 2000.), which have been shown to be effective in improving and sustaining vegetative resources. Holechek et al. state "a stocking rate at 90 percent of the carrying capacity, with some adjustment in drought periods, will provide relatively high sustained ranch income and maintain or improve range condition" (Holechek et al., 1989 pg. 203). Based on the estimated forage production, current grazing is at 80 percent of the carrying capacity for the summer grazing pastures, well within the recommendations of Holechek et al. In the winter pastures the stocking rate is at 27 percent capacity due to the fact that much of the available forage may not be accessible if high snowfall occurs. Monitoring data for the past 4 years indicates that, in general, utilization standards were met. For those key areas where standards were not met, actions (such as changing the duration of use in the area) were taken the following year to allow for recovery. Thus, there would be little change between the no action and action alternatives. However, with total absence of grazing, it is predicted that riparian vegetative resources would improve at a slightly faster rate under this alternative as compared to the grazed situation.

With respect to soils, no measurable difference would be observed with the removal of livestock. On those soils that are considered to be unsatisfactory within the Pajarito and Palomares Pastures, cattle are not exacerbating the situation because of distance from water, and the general lack of forage on these soils discourages use by cattle.

**Alternatives 2, 3, and 4** - Based on the utilization levels being proposed and estimated forage production, there would be very little difference in grazing related effects to soil and vegetation among the action alternatives. The same utilization standards would be applied to all grazing alternatives. Furthermore, as stated in the alternative description section, riparian areas were analyzed in detail in the recent Jemez National Recreation Area Management Plan Environmental Assessment and Forest Plan Amendment. The analysis indicated that riparian areas are being protected as required in the Jemez National Recreation Area Act. Additionally, mitigation and monitoring requirements developed as part of the Jemez National Recreation Area Plan have been incorporated into management of the San Diego Allotment. Minor differences between the three action alternatives are discussed below.

Under Alternative 2, the proposed facilities would not be constructed. This would allow for incidental drift of cattle into riparian pastures during unscheduled time periods due to lack fences or through fences that have been cut. Currently, however, when cattle do drift into pastures during unauthorized periods, permittees are contacted and the cattle are removed promptly. Without the construction of additional water developments in the Joaquin, Pajarito, and Palomares Pastures, the distribution of cattle would remain the same, but would not allow for contingency use during the summer if conditions warranted such use. In the absence of constructing new water developments and a fence to divide the Palomares Pasture, cattle would continue to congregate in the lower portion of the Palomares Pasture resulting in uneven distribution in the pasture and limiting the amount of management flexibility. Permittees would continue to operate without a corral in the Joaquin Pasture, thus the objective to facilitate cattle moving to and from Joaquin Pasture would not be met. The potential for unauthorized cattle grazing on tribal and forest lands would remain in the Pajarito Pasture as the allotment boundary fence would not be reconstructed.

Under Alternative 3, all proposed facilities would be constructed. Unscheduled use of pastures and riparian areas would be addressed through construction of cattle guards and pedestrian fence crossings that limit cattle movement, thereby maintaining or slightly improving the riparian vegetative resource by eliminating incidental use during unauthorized periods. Improved distribution would be achieved with the development of additional water sources on mesa top summer pastures as well as in winter pastures, making these areas available for summer use on a contingency basis. Construction of a fence in Palomares Pasture would discourage cattle from congregating in the lower portion of Palomares and result in better distribution in the pasture. While there currently is not a problem with overutilization, these facilities would further reduce the impact of livestock by spreading them out over a larger area. The potential for unauthorized cattle use on tribal and forest lands along the allotment boundary would be addressed through fence reconstruction. And with construction of the new corral in Joaquin Pasture, permittees would be able to more efficiently move cattle between summer and winter pastures.

Under Alternative 4, the facilities discussed under Alternative 3 would be implemented. Eliminating Holiday Pasture would require redistributing use in Joaquin and Pajarito Pastures. These pastures have been identified as having additional capacity but due to the time of year that they are used, this additional capacity is not always available. Constructing water developments in these pastures would allow them to be used during summer months. Little difference in vegetative condition is expected due to the utilization standards that would continue to be in effect. While current forage utilization in Holiday Pasture is within standards, the elimination of cattle from the pasture would result in no cattle utilization and, thus, no effects to vegetation resulting from cattle grazing.

Under all alternatives, little difference in impacts to soil resources would be observed because livestock grazing is currently having minimal impact, and there are no plans to increase grazing intensity. In those areas where soil conditions are unsatisfactory, use levels would be monitored and mitigation measures implemented to prevent negative impacts to soil.

### **Cumulative Effects**

Past, present, and reasonably foreseeable activities and their direct/indirect impacts within the San Diego Allotment have and will continue to influence the health, viability, and diversity of native plants.

Mountain meadows and grasslands are being lost to conifer encroachment and conifer stands are overly dense due to over 100 years of fire suppression and indirect effects of historical overgrazing. Consequently, the area is at high risk to crown replacement fires, and meadow ecosystems and forage productivity have been diminished. In much of the allotment this condition is being reversed largely as a result of large wildfires and prescribed burning. Wildfires, prescribed burning, and timber management have converted much of the low forage production rangeland with limited accessibility to highly productive rangeland with good accessibility. As a result, more area has been made available for grazing with increased forage production. Additional prescribed burns are scheduled in the future which will maintain forage production at relatively high levels.

As tree canopies continue to be opened up, understory vegetation abundance and diversity will increase providing good ground cover for soil protection and water infiltration. Proposed and alternative allotment livestock management would provide for ample residual vegetation to

promote proper watershed function. More precipitation will reach the soil and recharge ground water instead of tree canopies capturing a substantial amount and evaporating prior to entering the soil.

Increased recreational use and other vehicle use will increase the opportunity for introduction of new species and populations of invasive exotics, consequently increasing the need to intensify integrated weed management. Cattle may also introduce these species if they graze areas infested and are then brought onto the allotment. To date, the primary method of introduction appears to be through vehicles coming onto the forest, because all known populations are currently along major travel ways and parking areas. Integrated control and management of invasive, exotic plants would continue to protect vegetative diversity and productivity throughout the allotment. Some naturalized exotics (those that are widespread and commonly occur) will continue to colonize certain areas (usually disturbed areas), but proper vegetation management should maintain them at manageable levels.

As a result of growing popularity of the Jemez Mountains and shifting recreational use patterns, the Rio Guadalupe and Rio Cebolla areas have become one of the heaviest dispersed recreation areas on the Jemez Ranger District, and this resource use has been identified as one of the most critical impacts causing degradation to soils, vegetation, riparian habitat and water quality. Widespread, unrestricted use has contributed to the loss of vegetation cover, increased soil compaction, and increased erosion as a result of increased vehicle and foot traffic, litter, and numerous campfire rings adjacent to streams. Increasing numbers of sites continue to be established as forest users continue to seek out new areas for campsites. This generally results in newly established roads in poor locations (usually in open meadow riparian zones). Currently, actions are being taken to better manage the dispersed recreation by establishing area closures to off-road-vehicle use within riparian areas, educational signing, constructing barriers to sensitive areas, and providing specific parking and dispersed camping areas to maintain the dispersed recreation experience. These actions are expected to reduce overall negative impacts to soils, vegetation, riparian habitat and water quality.

Decommissioning roads, through permanent closure and/or obliteration, throughout the allotment is expected to reduce erosion and sediment delivery to stream systems. Special emphasis in removing roads and dispersed camping along and across perennial streams such as the Rio Guadalupe, Rio de las Vacas, and Rio Cebolla, as well as closure orders prohibiting overland travel in the wet meadows adjacent to streams would continue to reduce overall negative impacts to water quality from sedimentation. This, in combination with proper grazing management in riparian areas consisting of light grazing intensities proposed herein, would continue positive trends toward maintaining the high quality cold water fishery beneficial use.

## Water and Riparian

### Affected Environment

Streams, springs, and wetland riparian areas occur throughout the allotment. Three main drainages, the Rio Guadalupe, Rio Cebolla and the Jemez River, are located within the allotment; however, no grazing occurs along the **Jemez River**. Riparian areas are located along the main watercourses and in the vicinity of springs. Distinctive soil types, vegetation, and hydrologic conditions characterize riparian areas. These areas provide biologically diverse and productive

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

Because no grazing associated with the San Diego Allotment occurs along or in the vicinity of the **Jemez River**, this river segment will not be discussed in detail. Information on total maximum daily loads (TMDLs) and other factors influencing the Jemez River are present in the project record.

The **Rio Guadalupe** is a 5<sup>th</sup> order stream. It begins at the confluence of Rio Cebolla and Rio de las Vacas near the old, historic townsite of Porter and runs southward approximately 13 miles to its confluence with the Jemez River. The upper 6 miles of the Rio Guadalupe are within Guadalupe Pasture which is grazed for a short time in the spring and fall (refer to Table 3). The lower 7 miles are not grazed. The river is listed as fully supporting its designated uses for irrigation, livestock watering, domestic water supply, secondary contact, fish culture, and wildlife habitat. The river is listed as partially supporting its designated use as high quality cold water fishery. Probable causes of impairment include turbidity, stream bottom deposits, fecal coliform, conductivity, and aluminum. Probable sources of impairment are listed as: removal of riparian vegetation, recreation and tourism activities (other than boating), range grazing—riparian and/or upland, natural sources, habitat modification, grazing related sources, bank or shoreline modification/destabilization, and agriculture (New Mexico Environment Department 2002a, Appendix B, pg. 140).

In 1999, the Surface Water Quality Bureau of the New Mexico Environment Department prepared a report, “Total Maximum Daily Load for Turbidity and Stream Bottom Deposits for the Jemez River and Rio Guadalupe.” This report noted:

*The main source of impairment along these reaches appears to be road maintenance and runoff. This includes the flushing of arroyos after precipitation events that cross the road along the river and are then channelized directly into the streams. Recreation areas along the Jemez River have been established to provide fishing access to the rivers on Forest Service land. These recreational sites provide direct sediment input from the parking areas and have led to the removal of riparian vegetation and some streambank destabilization. Agricultural practices do occur along these reaches mostly in the form of grazing and appear to have contributed to the removal of riparian vegetation and streambank destabilization (New Mexico Environmental Department SWQB 1999, pg 7).*

The **Rio Cebolla** is a 4<sup>th</sup> order stream originating from a spring source near the northwest corner of the Valles Caldera National Preserve. The upper 15 miles (before it reaches Fenton Lake) is outside the San Diego Allotment boundary. The lower reach of Rio Cebolla (nearly 8 miles) from Fenton Lake south to the confluence with Rio de las Vacas is within the Fenton riparian pasture (currently not grazed) and Cebolla Pasture, currently grazed in early spring and fall (outside peak recreation use periods). This lower portion of the stream is listed as fully supporting its designated uses for: livestock watering, domestic water supply, secondary contact, fish culture, irrigation, and wildlife habitat. It is listed as not supporting its designated use as a high quality cold water fishery. Probable causes of impairment include stream bottom deposits. Probable sources of impairment are listed as recreation and tourism activities (other than boating), range

grazing—riparian and/or upland, highway maintenance and runoff, grazing related sources, and agriculture (New Mexico Environment Department 2002a, Appendix B, pg. 138).

As stated in the above paragraphs, grazing and grazing associated activities are one of several factors contributing to the condition of streams. Past grazing activities likely had a greater effect on the current condition of streams than current grazing activities. Prior to 1950, it was estimated that 7,100 head of sheep, 250 head of cattle, and 100 head of horses grazed the area for a total of 11,000 head months. Shortly after the Forest Service acquired the San Diego Land Grant, a watershed condition survey indicated the allotment had been badly abused. Grazing was subsequently eliminated from the area from 1967 to 1972.

Today, 264 cattle (252 cow and 12 bulls) graze the allotment, representing an 80 percent reduction in the grazing level prior to 1950. Range facilities have been constructed, a rotational grazing system utilizing pastures has been implemented, and upland water developments (pipelines, troughs, and earth tanks) have been installed. Riparian areas are managed differently than in the past. Also, grazing occurs at much lower levels and during periods that minimize impacts.

Riparian areas in the allotment are generally in “properly functioning” condition; however, some segments/reaches are not properly functioning based on stream survey data combined with Forest Service resource specialist’s ocular estimates. Much of the damage observed in riparian areas is attributed to heavy dispersed recreation use in the Jemez National Recreation Area where visitors tend to camp near water sources, resulting in trampling, soil compaction, vegetation loss, and increased sediment being deposited into the streams (USDA FS, 2002a).

## **Environmental Consequences**

**Alternative 1** – This alternative would result in the most beneficial effects to riparian areas related to domestic cattle grazing activities because there would be no cattle grazing in any riparian area at any time.

**Alternative 2** – No fences would be constructed and, therefore, on occasion cattle would continue to stray into Fenton Pasture and the Rio Cebolla during periods when no grazing is authorized due to lack of fences. Currently, when cattle drift into these areas, the permittees are quickly notified and cattle are removed from the area, limiting the effects of cattle grazing to short periods. There is potential, however, for this short-term use to result in minimal, localized streambank damage.

**Alternatives 3 and 4** – Fence construction is proposed under these two alternatives. The fences would meet the objective of preventing cattle from drifting into riparian areas and, as such, would further lower the potential for localized streambank damage and utilization of forage during periods when no grazing is authorized.

## **Cumulative Effects**

Controlling excess use of riparian areas and limiting authorized use to a short period of time in the spring and summer, combined with minimizing damage from recreation use through implementation of “Respect the Rio” projects, will facilitate riparian area recovery and

recruitment of riparian dependent species. Maintenance of wet meadows will benefit aquatic habitat and improve overall water quality.

## **Air**

### **Affected Environment**

The San Diego Allotment is within a Class II air quality management area that is in attainment of all air quality requirements.

### **Environmental Consequences**

None of the alternatives being considered would have any measurable direct or indirect effect on air quality in this area. Because this project would have no direct or indirect effect, there would be no associated cumulative effects.

## **Wildlife and Fish**

### **Affected Environment – General Wildlife**

San Diego Allotment provides habitat for a variety of wildlife. Vegetation changes with elevation and landform, with piñon/juniper woodlands in the southern low elevations and mixed conifer forests present at higher elevations. Pines, juniper and other conifers are utilized by wildlife as a source of mast, for nesting, and for cover. Aspen habitat is also present due to numerous fires that have occurred over past decades, and down wood is abundant in these areas.

Water is available year-round in the Rio Cebolla and Rio Guadalupe and in some of the other canyons. On the mesa tops, water is available seasonally, during snowmelt and storm runoff. Several springs, manmade earthen dams, and cattle water tanks provide other water sources; however, some cattle watering sources fed by pipelines are only in operation when cattle are grazing in associated pastures.

General wildlife species expected to occur within the allotment include (but are not limited to) mule deer, coyotes, mountain lion, bear, bobcats, ring-tail cats, squirrels, bats, other small rodents, and a variety of birds including turkey, hawks, owls, and songbirds.

### **Environmental Consequences – General Wildlife**

Effects of grazing on wildlife have potential to occur in the allotment only where grazing occurs. Approximately 43 percent of the total allotment acres (about 43,800 acres) contains suitable forage and is actually open and accessible to cattle. Another 7 percent (about 7,100 acres) is open to grazing but is not totally suitable because of lack of water, corrals or other range facilities. Because impacts would not occur on approximately 50 percent of the allotment that is not grazed, habitat would remain within the allotment for all species, and any impacts to individuals of species would not impact overall population.

On the acres that are grazed, potential effects to wildlife include those caused by cattle foraging and moving through areas, and from permittee activities in support of livestock operations. Effects could include impacts to ground-nesting birds; litter and burrowing species such as small rodents, amphibians, and reptiles; and birds which nest in shrubs or low tree branches. Breeding season impacts would only occur in those pastures grazed in spring or early summer (Guadalupe, Cebolla/Lake Fork Canyon, Cebollita/Upper Virgin, Holiday, Lake Fork Mesa, Porter and Schoolhouse). There could be competition for forage with other ungulates and forb/shrub users, such as rabbits and other small rodents. In areas of heavier cattle concentrations, soil could become compacted deterring movement of salamanders, voles, insects, and other subsoil species. Permittee activities for care and maintenance of cattle and allotment facilities, depending on frequency and intensity, could create short-term noise and movement disturbance. Any potential impacts would be greater during the breeding season.

New fences could block travel paths or cause injuries from barbed wire snags. However, all fences would be constructed to wildlife specifications, which would minimize impacts.

Grazing can cause localized changes in vegetation structure and composition. Depending on duration and intensity of grazing, short-term loss of cover/food can occur and could lead to more long-term shifts in vegetation cover, changing animal species occurrence (i.e., could change prey base and have localized impacts on predator populations, necessitating increased hunting range distances).

Pasture rotation would minimize the potential for some of the above effects. Monitoring, accompanied by timely adjustments in management that respond to monitoring results, also minimizes potential for some of the above effects, although it is possible that localized areas could be overgrazed.

Localized areas of concentrated grazing could impact streambank vegetation resulting in limited willow/other shrub growth with resultant decreased cover/forage/nesting sites for riparian corridor wildlife species. Streambanks can become physically modified by trampling and removal of vegetation. Sedimentation and lack of streambank vegetation can cause streams to become shallower and can lead to a lack of adequate woody debris cover. Resulting decreases in water quality and aquatic habitat can impact habitat diversity and increase stream temperatures.

Following guidelines in Riparian Area Management TR 1737-14 1997 Grazing Management for Riparian Wetland Areas, USDI BLM, USDA Forest Service, as noted below would minimize potential for the above impacts.

Utilization guidelines, where used for riparian areas and riparian pastures, should:

- Maintain both herbaceous and woody species (where present) in a healthy and vigorous condition and facilitate their ability to reproduce and maintain different age classes in the desired riparian plant community.
- Leave sufficient plant residue to protect banks, filter sediment, and dissipate flood energy during runoff events.
- Maintain consistency with other resource values and objectives; e.g., esthetics, water quality, etc.
- Limit streambank shearing and trampling to acceptable levels.

Consultation with our district rangeland management specialist (Padilla 2003, personal communication) notes that since 1999, in general, monitoring indicates that grazing related standards have been adhered to indicating that there is little or no competition at this time between ungulate species in sites monitored.

**Alternative 1** – Once cattle are removed from the allotment, there would be no grazing effects on wildlife. There would be no disturbances from cattle grazing or permittee management use; all forage would be available with no competition. Both upland and riparian vegetation would be expected to become more abundant and more diverse over time, increasing forage and cover for wildlife.

**Alternative 2** - Effects would be the same as the general wildlife effects; however, there would be no benefit from additional water sources in the allotment.

**Alternative 3** - Potential impacts would include those under general wildlife effects noted previously. Under this alternative, nonuse of Lower Virgin Pasture would provide additional acres available for wildlife with no disturbance or competition from livestock.

Construction of earthen dams would create additional water sources and provide better distribution of water availability in the allotment for all species of wildlife. By providing more upland sources for water, cattle should become better distributed throughout the allotment decreasing potential for breaking fences and moving into riparian areas outside of the assigned grazing period. Not all water developments are made available year-round; some are turned off when pastures are not in use by cattle. This could create problems for wildlife that become dependent on those water sources. There would be short-term disturbance from equipment use and human activity during construction of earthen dams; however, disturbance would be minimal as it usually takes one-half day or less for construction of each dam.

These earthen dams would have both positive and negative effects to wildlife species. Many species would benefit from additional water sources during dry periods of the year. Predators, such as snakes, hawks, coyotes, etc., could benefit from the concentration of prey near the water source—to the detriment of the prey species. Cattle grazing could reduce the vegetation around the water source possibly reducing cover and forage sites. Expanding livestock distribution would result in additional grazing in upland areas that formerly were grazed less or not grazed. However, it would be expected that broader cattle distribution and additional grazing in upland areas would have minor impacts to wildlife as long as the appropriate allowable use standards for grazing and required stubble heights are maintained. Rotational grazing would also help maintain adequate forage/cover for wildlife.

Construction of 3.25 miles of pipeline from Schoolhouse Pasture to Porter Pasture would create temporary disturbance during construction. There would also be potential for impacts to ground-burrowing species during clearing and trench digging for installation of the pipeline. Because the pipeline would be buried, there would be no travel corridor obstruction or other long-term effects. Scheduling construction of the pipeline and corral outside the breeding season (avoid May 15 through July 1) would minimize effects to breeding birds.

Construction of a quarter-acre corral in Joaquin Pasture would create temporary disturbance during construction and use of this corral. Disturbance impacts usually decrease within one-quarter mile of the disturbance as trees, wind, and other topographic features dissipate noise.

**Alternative 4** - Effects would be the same as in the Proposed Action with the exception that there would be no effects to wildlife associated with cattle grazing in the Holiday Pasture.

**Affected Environment – Proposed, Endangered, Threatened, and Sensitive Species**

No endangered species are present on the allotment. Proposed, threatened, and sensitive species that occur or have potential habitat within portions of this allotment include those listed in Table 14.

**Table 14. Proposed, Endangered, Threatened, and Sensitive Species**

Scientific Name	Common name	Status
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Threatened
<i>Strix occidentalis lucida</i>	Mexican spotted owl	Threatened
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	Candidate
<i>Zapus hudsonicus luteus</i>	New Mexican jumping mouse	Sensitive
<i>Accipiter gentilis</i>	Northern goshawk	Sensitive
<i>Falco peregrinus anatum</i>	Peregrine falcon	Sensitive
<i>Rana pipiens</i>	Northern leopard frog	Sensitive
<i>Plethodon newmexicanus</i>	Jemez Mountains salamander	Sensitive
<i>Onchorhynchus clarki virginalis</i>	Rio Grande cutthroat trout	Sensitive
<i>Rumex orthoneurus</i>	Chiricahua dock (plant species)	Sensitive

The allotment does not have suitable habitat range for, or is outside the range of, the: black-footed ferret, southwestern willow flycatcher, Rio Grande silvery minnow, Pecos bluntnose shiner, Holy Ghost ipomopsis, swift fox, Goat Peak pika, boreal owl, white-tailed ptarmigan, blue-black silverspot butterfly, hairless fleabane, Arizona willow, and Parish’s alkali grass. Species that may occur are described in the following paragraphs.

**Bald eagle:** Bald eagle occurrence is uncommon on the Jemez Ranger District. The mountains contain no known breeding habitat; however, migrating/wintering eagles could pass through and roost, but it would be on a transient basis. Incidental sightings of bald eagles in the winters of 2002/03 and 2003/04 were reported along Forest Road 376 (within the San Diego Allotment) and near Fenton lake. Wintering bald eagles near the Jemez Mountains are known to use Cochiti Lake (> 20 miles east of the allotment) and the upper Chama River (>40 miles north of the allotment). This allotment does not occur in a subwatershed that drains into any identified bald eagle nesting habitat. During their infrequent use of the San Diego Allotment, bald eagles would most likely move through, perch/roost, or forage on ungulate remains or other carrion.

**Mexican spotted owl (MSO):** There are five occupied protected activity centers (PACs) within the San Diego Allotment as well as about 18,000 acres of mixed conifer potential foraging habitat. No range facilities (earthen tanks, water troughs, fence lines, etc) are proposed within the PACs and current utilization meets established MSO standards.

**Western yellow-billed cuckoo:** Forested areas of the allotment would not provide suitable habitat for this species; however, potential nesting habitat could occur along streams within this allotment. The cuckoo would likely prefer the lower elevation stream segments along the Jemez River and Rio Guadalupe where cottonwoods and willows are abundant—these areas are closed to grazing.

**New Mexico Jumping Mouse:** Grassy riparian meadows provide habitat for the jumping mouse and this species has been reported along the Rio Cebolla within the allotment (Morrison, 1985).

**Northern goshawk:** There are two known goshawk nesting territories within the allotment and two on the border of the allotment. Breeding, roosting and foraging habitats are present in the mixed conifer and ponderosa pine forests of the allotment (about 58,800 acres).

**Peregrine falcon:** Falcons could forage throughout the allotment and there are designated suitable breeding sites within the allotment. One is located in an area closed to grazing. Two are in areas partially closed to grazing (75 percent closed), one overlaps the allotment by 25 percent, one falls outside the allotment and three are wholly within the allotment in areas that are open to grazing.

**Northern leopard frog:** Habitat is present within the allotment along riparian corridors.

**Jemez Mountains salamander:** The majority of the allotment falls outside potential salamander habitat. Lake Fork, Lower Lake Fork, Fenton, and a small portion of Cebolla Pasture are within what is defined as regular survey zone; however, there are no known occupied Jemez Mountains salamander sites within these pastures.

**Rio Grande cutthroat trout:** While recent fish surveys reveal that no Rio Grande cutthroat trout are present within streams on the San Diego Allotment, the Rio Cebolla and Rio Guadalupe are designated as proposed habitat for future reintroduction of Rio Grande cutthroat trout. Per a signed conservation agreement between the New Mexico Department of Game and Fish and USDA Forest Service, the “forest shall identify potential suitable habitat for range expansion and work to enhance these and currently inhabited Rio Grande cutthroat trout waters.” In this context, enhance is defined as “protect, maintain, and improve existing and potential Rio Grande cutthroat trout habitat and manage those watersheds and stream riparian habitats to ensure long-term conservation and persistence of the subspecies (New Mexico Department of Game and Fish et al, 2002b).”

**Chiricahua dock:** No occurrences of this plant have been reported on the Jemez Ranger District; however, there is potential for this plant to occur in riparian meadow areas.

### **Environmental Consequences - Proposed, Endangered, Threatened, and Sensitive Species**

**Alternative 1** – Once cattle are removed from the allotment, there would be no effects from grazing on any proposed, endangered, threatened, or sensitive species. Existing water developments would be retained as deemed beneficial to wildlife.

**Alternatives 2-4** – Livestock grazing within this allotment would have no effect on:

- **Bald eagle** because no known breeding habitat or roost sites occur, and bald eagle presence in the allotment is infrequent. This meets the criteria designated in the USDA guidance criteria (USDA FS, 2004c) for no effect determination.

Grazing may affect, but would not likely adversely affect:

- **Mexican spotted owl** because, under Alternative 2, no new facilities are proposed and under Alternative 3, facilities would not be constructed within any PACs, therefore, there would be no disturbance resulting from construction activities during the breeding season. Furthermore, implementing adaptive management would allow for a minimum cover height of 4 inches of herbaceous vegetation to be maintained, providing cover for the owl's prey species. Under Alternative 4, grazing would be eliminated from Holiday Pasture (located near a PAC). It is expected that prey species may slightly increase within this pasture due to the vegetation not being grazed and the pasture being able to support more small animals. As such, there may be a slight increase in food availability for the owl in Holiday Pasture.
- **Proposed critical habitat for the Mexican spotted owl** occurs on portions of the San Diego Allotment. With adherence to established utilization guidelines, grazing would not likely cause adverse effects to proposed critical habitat.
- **Rio Grande cutthroat trout**. While there are no Rio Grande cutthroat trout currently present on the allotment, potential habitat is present. Established riparian guidelines (incorporated from Jemez National Recreation Area Plan) and fencing (proposed under Alternatives 3 and 4—moving grazing away from riparian areas ) are expected to have a limited effect on potential Rio Grande cutthroat trout habitat. If Alternative 2 were selected, cattle trailing into riparian areas would possibly have a greater long-term effect on potential Rio Grande cutthroat trout habitat by slowing or impeding riparian recovery.

Grazing would not cause a trend to Federal listing or decrease the overall population of:

- **Western yellow-billed cuckoo** because the forested portions of the allotment do not provide habitat, and the more preferred lower elevation stream habitats are closed to grazing. Should the cuckoo nest in other riparian areas of the allotment, there may be impacts to individuals as cows moving through riparian shrubs could impact nests and young. This effect is expected to be slight because Fenton riparian pasture is rested under all alternatives and Virgin Canyon riparian pasture is closed under Alternatives 3 and 4; and rested under Alternative 2. Furthermore, riparian areas in the Guadalupe, Cebolla, and Lake Fork Canyon Pastures are not only at higher elevations (less desirable), but grazing is limited to short duration in the spring and fall.
- **New Mexico jumping mouse** because maintaining 4 inches of stubble height in grazed areas would be expected to minimize any grazing impacts and maintain populations of jumping mice. Riparian meadows in the Fenton, Virgin Canyon, Lower Guadalupe, and Jemez River areas are closed to grazing and would be available to the mouse with no associated grazing disturbance. Other riparian pastures in the allotment would have a low potential for impacts to jumping mice because of the short amount of use these areas would receive.
- **Northern goshawk** because goshawks typically nest in larger/taller trees and cattle grazing would not be likely to create a disturbance to nest sites. Under Alternatives 3 and

- 4, two earthen tanks would be constructed in Palomares Pasture in the outer edge of the foraging area of a previously occupied goshawk territory. Management activities are permitted year-round within foraging areas, and tank locations are at the outer edge of the foraging area—not near the post-fledging area boundary. While permittee activity (movement, noise, construction) may disturb nesting goshawks, this effect is expected to be low due to a mitigation measure requiring that all construction activities within potential habitat be conducted outside the breeding season. Eliminating grazing in Holiday Pasture under Alternative 4 is expected to slightly increase prey species due to the ungrazed vegetation in the pasture being able to support more small animals. As such, there may be a slight increase in food availability for the goshawk in that pasture.
- **Peregrine falcon** because falcons nest in cavities high on cliffs where cattle would have no access; thus, there would be no potential for direct impacts to sites. Also, none of the proposed range improvements (fences, water developments, etc.) are within designated suitable breeding habitat. Visual or noise stimuli during early breeding season would have potential for short-term and localized effects to breeding birds; however, this effect is likely to be minimal because only two of the seven suitable nest sites are within pastures grazed during the falcon’s breeding season (spring to early summer). One pasture is grazed for an average of 7 days in the spring and any visual or noise effects from grazing would be temporary; and the other is grazed for an average of 30 days after June 1—eliminating effects during early breeding season.
  - **Northern leopard frog** because impacts would be limited to chance disturbance of eggs when cattle enter streams or ponds to drink. Potential impacts would occur only in those riparian pastures grazed in early spring prior to the hatch, and it is unlikely that there would be more than nominal loss of eggs because cattle grazing is limited during this period.
  - **Jemez Mountains salamander** because of the limited amount of potential habitat within this allotment. Also, of the pastures that have potential habitat, a large portion of the land is on steep, rocky slopes where cattle tend not to graze. Furthermore, the current number of cattle grazing in the area is not believed to be a direct threat to viability of Jemez Mountains salamander populations (New Mexico Endemic Salamander Team, 2000). Range facilities proposed under Alternatives 3 and 4 are not within potential Jemez Mountains salamander habitat.
  - **Chiricahua dock** because no occurrence of this plant has been reported within the allotment.

### Affected Environment – Management Indicator Species

Management indicator species have been designated in the forest plan to aid in the assessment of management effects on wildlife species and habitats (USDA FS 1987a, pgs. 146-148). Those species that could occur within the San Diego Allotment include **Merriam’s turkey, piñon jay, hairy woodpecker, mourning dove, Mexican spotted owl, Rocky Mountain elk, and Rio Grande cutthroat trout**. Mexican spotted owl and Rio Grande cutthroat trout were previously discussed.

**Merriam’s turkey** (*Meleagris gallopavo*): The most common subspecies of turkey, it is found in many mountainous areas of northern New Mexico. Surface water is a range requirement and, as such, populations may be limited on the allotment to riparian areas and locations surrounding

springs and tanks on the otherwise dry mesa tops. Hens normally nest within one-half mile radius of water. Ponderosa pine is an essential component of a turkey's permanent habitat; used as a source of mast and as a favorite roosting tree. Turkeys forage in grasslands, brush communities, deciduous tree-brush, and in ponderosa pine. They eat grasses and grasshoppers in the summer and oak mast, piñon nuts, and mature ponderosa pine seeds in the fall. Tall grasses are eaten in the winter when heavy snows come. Approximately 83,400 acres in the project area contain suitable vegetation cover for Merriam's turkey and the Santa Fe National Forest provides about 1.3 million acres of suitable turkey habitat.

**Piñon jay** (*Gymnorhinus cyanocephalus*): nests mainly in stands of piñon-juniper or pine woodlands. Nests occur about 3 feet off the ground. The diet of the piñon jay consists of pine nuts, conifer and other seeds, fruits, insects, bird eggs, and nestlings. They breed in colonies of up to 150. They are nonmigratory but wander in winter flocks of hundreds to thousands. The Santa Fe National Forest has about 465,000 acres of piñon/juniper habitat and the San Diego Allotment contains potential habitat for the piñon jay on approximately 39,700 acres. However, piñon jays were not observed in bird surveys done within the allotment on Virgin Mesa (Dickson, 2002) or in recent breeding bird surveys conducted along Forest Road 376 (Fair, 2002).

**Hairy woodpecker** (*Picoides villosus*): is a forest generalist which keys in on snags, down logs, and live aspen. Nests are primarily in trees averaging 17 inches in diameter and approximately 60 feet high. These trees, as well as down logs, support insect populations for foraging. About 98,600 acres of the San Diego Allotment would provide breeding and foraging habitat, and there are approximately 900,000 acres of hairy woodpecker habitat available across the Santa Fe National Forest. Breeding bird survey data for New Mexico indicates a trend of about 5 percent increase in hairy woodpecker populations from 1980 to 2000 (Sauer et al., 2001). Based on habitat available, hairy woodpeckers would be expected to be common in the allotment. While no surveys have been conducted on the allotment specifically to identify woodpeckers, a verbal report from a survey conducted on Virgin Mesa as part of a larger study (Dickson, 2002) noted hairy woodpeckers. Nearby surveys conducted in the Cerro Grande and Viveash burn areas showed that hairy woodpeckers were one of the ten most common species seen (Kotliar, 2002). They were also common on surveys done in the Dome area (USDA FS, 2002b) and have been observed on breeding bird surveys conducted on Forest Road 376 (Fair, 2002).

**Mourning dove** (*Zenaida macroura*): Mourning doves are common to abundant in most counties across New Mexico. Throughout the Santa Fe National Forest, mourning dove habitat is abundant (approximately 990,000 acres). This species is primarily found in lower elevations of the forest; however, they can be found in Douglas-fir, ponderosa pine, spruce-fir, aspen, and piñon/juniper forest types. In all situations, abundant food and water must be available within 20-30 km and breeding habitat is limited to sites where water is available during the breeding season. Nests occur either in small trees or on the ground. Potential ponderosa pine, piñon/juniper and riparian vegetation forage areas occur on a total of about 83,400 acres of the allotment. Mourning doves have been recorded on Forest Road 376 (Sauer et al. 2001; Fair, 2002) and in bird surveys on Virgin Mesa (Dickson, 2002).

**Rocky Mountain elk** (*Cervis elaphus nelsoni*): inhabit most forest types with good forage and cover and utilize a variety of habitat types during the course of their lives. The Santa Fe National Forest contains approximately 1,600,000 acres of elk habitat, of which the San Diego Allotment provides about 64,500 acres of accessible forage. The northern, higher elevations of the allotment are used mainly in summer, and elk are driven to lower elevations of the allotment

when snow accumulates. Elk populations on the Santa Fe National Forest are stable to increasing. The estimated prehunt population (which includes Hunt Units 6A, 6B, and 6C) for September 2002 is 5,200 (New Mexico Department of Game and Fish, 2002a). A large percentage of the Jemez herd summers on the Valles Caldera National Preserve. Many of these elk move through Hunt Unit 6A—in which this allotment is located—migrating to and from winter/summer habitat.

## Environmental Consequences – Management Indicator Species

**Alternative 1** – There would be no potential for grazing impacts to any management indicator species (MIS). There may be a slight increase in vegetative cover, which would provide for more cover for ground nesting turkey. Eliminating grazing would also slightly decrease the amount of water available on mesa tops that is currently fed to tanks through pipelines managed by grazing permittees.

**Alternatives 2 to 4** – Continuing to permit cattle grazing under these alternatives will have no negative impacts on overall species population and trend for:

- **Merriam’s turkey** – because, while grazing can impact individual nests and young, the impact is anticipated to be small due to implementation of mitigation and monitoring measures that would maintain minimum utilization standards, providing sufficient remaining forage and cover for turkey. Adding water developments under Alternatives 3 and 4 would provide additional water sources for turkey, particularly in the uplands where water can be scarce.
- **Piñon jay** – because, while grazing can impact individual nests and young, this impact is anticipated to be small as a large portion of the piñon/juniper habitat area is not open to grazing or not grazed during spring nesting season.
- **Hairy woodpecker** – because woodpeckers nest and forage primarily high in the canopy of large diameter trees, these areas would be minimally affected by grazing and permittee activities.
- **Mourning dove** – because morning doves primarily nest in trees 10 to 25 feet off the ground, the potential for loss of nests due to abandonment resulting from disturbance associated with grazing would not likely be measurable above the normal population fluctuations that occur from year to year.
- **Rocky Mountain elk** – because monitoring data since 1999 indicates forage use to be within the 40 percent utilization levels—indicating competition between elk and livestock for forage is not occurring. Developing water sources under Alternatives 3 and 4 would provide water for elk in upland areas. Constructing fence lines to wildlife standards (mitigation measure) would allow for safe elk migration and passage.

## Affected Environment – Migratory Birds

New Mexico Partners in Flight lists priority species of concern by vegetation type. The following priority birds could occur in the allotment: northern goshawk, Mexican spotted owl, Williamson’s sapsucker, olive-sided flycatcher, dusky flycatcher, flammulated owl, Virginia’s warbler, Grace’s warbler, red-naped sapsucker, Hammond’s flycatcher, American dipper, MacGillivrey’s warbler, gray flycatcher, Bendire’s thrasher, and black-throated gray warbler.

There are no associations or important links between bird communities in the San Diego Allotment and important bird areas (IBAs). The closest IBAs are presented in Table 15.

**Table 15. Important Bird Areas**

IBAs	Distance from Project Area
Golondrino Mesa (proposed)	> 35 miles
Chama River Gorge from El Vado to north end of Abiquiui Reservoir	>30 miles
Caja del Rio and the Santa Fe River Canyon below the Caja del Rio on both BLM and FS lands	>15 miles

Overwintering areas generally consist of large wetlands. Important overwintering areas recognized on the Santa Fe National Forest include the Rio Chama and Rio Grande corridors; both are well outside the allotment. While portions of the allotment could provide migration/winter roost sites for bald eagle; these areas are not recognized as important overwintering areas because significant concentrations of birds do not occur here nor do unique or a high diversity of birds winter here.

### Environmental Consequences – Migratory Birds

**Alternative 1** – as no grazing would be authorized, there would be no project related impacts to migratory birds.

**Alternatives 2 to 4** – Overall the deferred rotation grazing system would result in minimal impacts to birds and their habitat provided appropriate utilization standards for grazing are met.

In localized areas, individual birds could be negatively impacted by grazing and permittee activity; however, these losses would not be expected to cause declines in overall species population. Impacts to individual birds from grazing could result from noise and disturbance from cattle movement and permittee activity. Effects are greater if they occur during the breeding season when nests and young can be impacted. Depending on intensity and duration of disturbances, adults can fly from major disturbances and, if early enough in the breeding season, can reneest. Outside of the breeding season, most birds can escape or avoid disturbance. Pastures where grazing would occur during the bird breeding season are the Cebolla (21 days), Cebollita (30 days), Guadalupe (14 days), Holiday (30 days), Lake Fork Mesa (21 days), Lake Fork Canyon (21 days), Porter (30 days), Schoolhouse (30 days) and Upper Virgin (30 days)<sup>3</sup>.

Development of more water sources as proposed in Alternatives 3 and 4 would provide both positive and negative impacts. Birds would benefit from more distributed water sources for drinking, bathing, and emerging insect sources. Livestock and other ungulate use around the water could reduce vegetation, damaging nests and reducing forage and cover. Water sources could also attract more predators to the site, increasing avian predation (Finch et. al., 1997).

<sup>3</sup> Estimated days per pasture. Under adaptive management, timing can change based on utilization, range readiness, and other resource conditions.

## Cumulative Effects

Improved management under the action alternatives would provide localized impacts or improvements to riparian communities and rangeland condition. Improvements in habitat conditions and removal/reductions in grazing-related disturbances are expected to reduce cumulative impacts that are affecting fish, wildlife, and their habitat. Cumulative effects associated with specific alternatives are listed below.

**Alternative 1** – Under the no grazing alternative, once cattle are removed from the allotment, cattle grazing would not contribute to any other effects.

**Alternatives 2 to 4** – Current projects/events noted previously could contribute to cumulative effects of disturbance if they occurred at the same time and location; but any potential disturbance effects from these projects would be temporary for the period of project activity.

Recreation use in the allotment, especially camping and fishing, occurs mainly in the lower elevations near streams, specifically the Rio Cebolla, Jemez River, and Rio Guadalupe. There is little concentrated recreational use in the upland areas, other than along FR 376. It is probable that wildlife have adjusted to avoid areas of heavy recreation use; therefore, there would be little opportunity for combined effects of grazing and recreation on wildlife.

Past and present timber sales have decreased dense conifer stands and created open stands with more grass and shrubs, creating better distribution of available forage for cattle and wildlife. This improved forage distribution would help decrease any localized competition between wildlife and cattle for available forage. Past development of earthen dams in combination with those proposed in this project will better distribute water sources throughout the allotment.

Past development of water sources combined with proposed developments would expand availability of water. Because forage and water would be better distributed, cattle and wildlife would be more widespread through the area decreasing chance encounters and disturbance potential to wildlife.

Current placement of a fence to keep cattle out of the Rio Cebolla meadows above the Seven Springs hatchery, along with planned future willow plantings along the riparian corridor, and moving campsites away from the riparian corridor, would restore riparian vegetation for wildlife cover and forage and improve aquatic habitat.

Because grazing would occur within established standards and guidelines, there should not be a general lack of forage for wildlife in the grazing allotment, although there may be some localized areas of forage competition.

Cumulatively, past timber sales, wildfires, and prescribed burns have created a mosaic of wildlife habitats throughout the area with expanded grass, forbs and shrub regrowth, providing more diverse forage opportunities. Grazing intensity, when managed according to grazing standards and guidelines, would be rotated across the allotment. Although there could be some localized areas where wildlife and livestock would compete for food, forage opportunities would be well distributed. The increase in grass and forbs could distribute grazing more effectively over the area, decreasing the potential for localized grazing impacts. No adverse cumulative effects on proposed, threatened, or sensitive species would be expected and no overall decrease in populations for any management indicator species or migratory birds, would be expected.

## Heritage Resources

### Affected Environment

Prehistoric use of Jemez Mountain resources began several thousand years ago with traveling bands of people coming to the mountains to collect obsidian, hunt, and gather plant materials. There is no evidence that these early visitors to the area constructed permanent dwellings, rather they lived a nomadic lifestyle, likely passing through the area on a seasonal basis. Beginning around 1150 AD, a dramatic increase in population occurred in the area as evidenced by the remains of small dwellings located along some drainages in the area. By 1350, ancestors of the current day Jemez Pueblo had begun to settle on the mesa tops within the San Diego Allotment.

The majority of known prehistoric sites in the San Diego Allotment are considered to be ancestral Jemez Pueblo sites dating between AD 1350 and 1700. These sites consist of field houses (generally one- to four-room dwellings), cavates (small natural voids in the volcanic tuff, enlarged and improved by people for storage or habitation), rock shelters, rock art panels, artifact scatters, and agricultural features (rock alignments, water control features). These sites are usually found in association with prehistoric pueblo sites ranging from single room blocks of 10 or so rooms up to large, multistoried pueblos often containing multiple kivas, plazas, and up to 2,000 rooms. Fifty-eight pueblos are documented on the allotment with 14 containing in excess of several hundred rooms that possibly once stood up to 4 stories high.

Field house sites are the most common recorded on the allotment. They are generally thought to have functioned as seasonal dwellings, likely used to watch over fields, but also probably used as hunting camps and lookouts. To date, 1,484 field houses have been recorded within the allotment. These field houses are concentrated around multi-room pueblos, a number of field houses contain standing walls, a few still retain portions of roof beams.

By 1598, the Spanish had established a presence in the area, founding a mission at Giusewa (present day Jemez Monument located in San Diego Canyon). Beginning in the early 1600s, the Spanish began to forcibly remove the Jemez people from their mesa top pueblos and resettle them into two locations in the canyon bottoms. Giusewa and Walatowa (present day Jemez Pueblo). In 1680, the Jemez participated in the Pueblo Revolt, a coordinated movement against the Spanish by the pueblos. Many of the Jemez people returned to their mesa top pueblos during this period. The Spanish returned to the area in the 1690s and their influence increased through time, particularly in the 18<sup>th</sup> century.

The Cañon de San Diego Land Grant was awarded to Francisco and Antonio Garcia de Noriega and 18 other Spanish settlers in the area in 1798. The United States Congress confirmed ownership of the land grant in 1861, following the requirements in the 1848 Treaty of Guadalupe Hidalgo. Sheep herding and cattle grazing were an important economic activity within the area. Between 1870 and 1904, portions of the common lands of the grant were sold off to private individuals. In 1904, the last original grantees sold their portion of the grant to the Jemez Land Company. Local families kept their grazing rights on the grant and continued to run sheep and cattle throughout the area into the 1960s (McGraw and McCray, 1996). Much of the approximately 116,290-acre land grant lies within the current San Diego Allotment, with the original grant boundary lines forming the western, southern, and portions of the eastern and northern boundary of the current day allotment. The Forest Service purchased the Cañon de San Diego Grant in 1965 from the New Mexico Lumber and Timber Company at which time it was

reported that the area had been heavily grazed and logged. Historic sites within the area are primarily associated with past grazing, logging, and mining activities.

From an ethnographic perspective, the area encompassed by the San Diego Allotment is of special significance to many of the families living in the modern Jemez Pueblo community of Walatowa. The area continues to be used extensively for traditional purposes by the people of the Pueblo of Jemez who trace their ancestry to many of the sites on the mesa tops. In addition to being important to the Pueblo of Jemez, the mesa tops also provide resources to traditional Hispanic families who have been present in the surrounding area for the past 300 years.

To date, 1,922 sites have been recorded within the San Diego Allotment. Table 16 illustrates the number of known sites located within each pasture of the allotment. The table also displays the amount of the pasture that has been surveyed for heritage resources. This is an important factor to consider as some pastures may only have a few recorded sites due to the lack of survey data.

Categories referred to in the table are related to eligibility of a site to the National Register of Historic Places. A site is considered eligible to the national register provided it is at least 50 years old, retains integrity, and meets one or more of the following criteria: (1) is associated with events that have made a significant contribution to the broad patterns of our history; (2) is associated with lives of persons significant in our past; (3) exemplifies a distinctive type, period, or method of construction, or the work of a master, or a high artistic quality; or (4) has yielded, or is likely to yield, information important in prehistory or history. Once a site is determined eligible to the national register, it can be formally nominated to and listed on the National Register of Historic Places subject to a thorough approval process.

**Table 16. Archaeological Sites Present in Each Pasture**

Pasture	Percent Surveyed	Recorded Sites	On NRHP	Eligible	Undetermined Eligibility	Not Eligible
Cebolla	40	101	0	19	82	0
Cebollita	20	11	0	5	6	0
Fenton Riparian	0	0	0	0	0	0
Guadalupe	50	256	0	175	79	2
Holiday	85-90	326	3	28	295	0
Joaquin	75	117	0	88	25	4
Lake Fork Mesa	95	4	0	0	1	3
Lobo	30	95	5	23	62	5
Lower Lake Fork	0	28	0	7	20	1
Lower Virgin	100	323	5	264	53	1
Pajarito	15	44	0	4	40	0
Palomares	15	172	5	74	91	2
Porter	60-70	255	1	111	140	3
Schoolhouse	40	102	0	37	63	2
Upper Virgin	100	65	1	44	20	0
Virgin Canyon	0	23	1	5	17	0
<b>Total</b>	<b>38%</b>	<b>1,922</b>	<b>21</b>	<b>884</b>	<b>994</b>	<b>23</b>

Often there are circumstances where eligibility is considered undetermined. In such cases, it is the professional judgment of an archaeologist that additional information is needed to be able to sufficiently determine eligibility. As an example, sparse artifacts may be visible on the ground surface but there clearly appears to be soil depth which may indicate the majority of the site is buried. Or, the surface of the site may exhibit the effects of disturbance such as artifact collecting and reuse of rubble from features, but the extent of subsurface disturbance is not known. Because excavation of sites is not always economically feasible, nor scientifically desirable, eligibility is defined as undetermined until such time that more information is gathered. In these cases, with respect to management, the site is treated as eligible.

Sites identified as not eligible do not meet the eligibility criteria listed above. Often they lack integrity or contain little artifactual information so that thoroughly documenting the site exhausts its future research potential.

Because heritage resources are considered a significant issue in the evaluation of alternatives, it is important to understand the nature and history of impacts to heritage resources within the allotment. For example, grazing has occurred on this allotment for the last 300 years, and heritage resources within the allotment have likely been exposed to direct and indirect effects resulting from past grazing. Additionally, many nongrazing activities have also contributed to the current condition of sites within the allotment. These include, but are not limited to, past recreational use, historic logging and road building, decades of wildfire management, and introduction of large game species.

For many years the area has been a popular recreation destination, and many sites, particularly those in the vicinity of streams, have been heavily impacted by decades of recreational activities. Building stones have been taken from features and used for campfire rings, wood features have been burned, surface artifacts collected, and soil erosion accelerated through establishment of nonsystem roads accessing dispersed campsites.

Prior to Forest Service acquisition of the San Diego Grant, a century of logging and associated road building left its impact on the land and sites. Archaeological sites and features have been recorded along old logging roads and, in several instances, the roads cut through field house features and artifact scatters. Some historic logging camps are located on top of prehistoric sites. And, interestingly, located adjacent to some historic cabin sites are field house sites that have been almost completely excavated, very likely by past inhabitants of the cabins. One large pueblo site (now listed on the National Register of Historic Places) was damaged several decades ago by a bulldozer operator who purposely cut through a room block out of curiosity.

Wildfires, suppression, and rehabilitation activities have also affected sites in the area. In Porter Pasture, a number of sites were exposed to the direct and indirect effects of a high intensity wildfire and subsequent rehabilitation activities including discing and replanting several hundred acres located along Stable Mesa. This resulted in destruction of about 100 sites—in this case, damage caused by the wildfire and subsequent discing far exceeds any damage that may occur from cattle grazing or other management practices. Historic sites are particularly vulnerable to the effects of wildfire. In the early 1990s, a wildfire in Holiday Pasture burned several cabins located within an historic logging camp listed on the National Register of Historic Places. Similarly, in 2003, a fire in Virgin Pasture burned several structures associated with another historic logging camp, also listed on the National Register of Historic Places.

In the 1960s, elk were reintroduced in the Jemez Mountains. Their presence is relevant because the effects of elk browsing on an archaeological site can be quite similar to that of a domestic cow. Elk create and use trails leading to water sources and summer/winter habitats. Elk generally weigh between 600 (cow elk) and 800 pounds (bull elk) and, as such, can trample and alter artifacts and features in much the same way as cattle. Elk have also been known to rub against objects (including walls of archaeological sites). Thus, in the absence of tracks, identifying the cause of trampling damage that occurred years ago is difficult, if not impossible.

Finally, one must consider the past effects of over 300 years of sheep, horse and cattle grazing in the area. Prior to Forest Service acquisition of the San Diego Land Grant, the area was heavily grazed by sheep, horses, and cattle. After the Forest Service acquired the land in 1965, cattle were removed for a period of several years. In 1972, cattle were permitted back on the allotment at an 80 percent reduction from historic levels, and sheep were no longer permitted. The indirect effects of past grazing can extend over hundreds of years. Changes in species composition resulting from past overgrazing and increases in wildfire severity can result in changes in vegetation, wildlife habitat, distribution of species, and water availability. From a cultural perspective, the effects of past grazing pressures can alter traditional uses of Pueblo and Hispanic populations that continue to utilize the plant and animal resources of the area. For example, some medicinal plants may no longer be present, traditional springs may no longer run, and some animal species may no longer populate the area.

Over the past decade, rumors and anecdotal reports have surfaced related to cattle grazing on archaeological sites within the San Diego Allotment. Types of damage identified from these rumors include people observing broken artifacts in cattle trails or observing cattle bedding down adjacent to walls. There have also been a few reports of cattle congregating near reservoirs and plaza areas associated with the larger mesa top pueblos. In an effort to clarify these rumored effects, an extensive literature search of sites within the allotment was conducted. Few site forms recorded any evidence of cattle or negative effects associated with cattle grazing. Without data verifying damage or at least the presence of cattle at archaeological sites, valid statements about the effects of cattle grazing on sites within the San Diego Allotment could not be made.

Therefore, in an effort to gain a better understanding of the current condition of sites and to identify potential effects to sites resulting from cattle grazing, the Jemez Ranger District initiated a heritage resource monitoring program on the allotment in 2001. The purpose of the monitoring program was to determine whether cattle had been within site boundaries and, if so, to identify any effects to sites related to grazing. The site monitor also identified the potential for a site to be affected by cattle grazing in the future. For example, was the site near a water development or trail and did it contain features (such as standing walls) that could be at risk in the future? A total of 218 sites were monitored. The sample was stratified to include examples of all types of sites represented. The sample concentrated on sites where cattle effects would be expected, such as along fence lines and in the vicinity of water developments. Monitoring efforts were also concentrated in pastures with high site densities.

While monitoring results indicate that cattle had been present on a number of archaeological sites and there were effects noted, much of the observable damage on sites appeared to be old and was identified as being associated with past grazing practices, not present grazing activities. Thus, due to lack of monitoring information specific to effects on heritage resources from the past couple of centuries, it would be hard to argue that the past heavy sheep and cattle grazing on the San Diego Allotment did not result in adverse impacts to heritage resources. Rather, it is very

likely that past overgrazing, in combination with other land uses, led to increased erosion which affected the integrity of archaeological sites. It is also likely that cattle and sheep over the past centuries have bedded down adjacent to walls, leaned or rubbed on standing walls, and contributed to their collapse. Similarly, it is likely that activities associated with sheep herding and cattle grazing contributed to adverse impacts on sites. These associated activities include early reuse of some standing features for human shelter, as well as reuse of feature rubble for campfire rings or to fill in ruts in roads, secure fence posts, etc.

## Environmental Consequences

In analyzing the effects of grazing related to heritage resources, it was important to differentiate between the effects of past grazing and those of proposed grazing. Thus, regardless of whether past grazing resulted in adverse effect to sites, the question was whether the *current or proposed grazing management* would result in an adverse effect to heritage resources within the San Diego Allotment. In making this determination, the overall, general effect permitted grazing may have on heritage resources—as well as the effect of specific proposed improvements on heritage resources—was considered.

In considering the potential effects to archaeological sites from cattle grazing, several grazing studies were consulted (Roney, 1977; Osborn et al. 1987; Horne and McFarland, 1993). These studies focused on the effects of grazing on archaeological sites, noting that most noticeable effects can be attributed to trailing through sites and trampling artifacts and features<sup>4</sup>. Trampling can result in breaking artifacts and altering features, particularly when the ground is wet and hooves are able to penetrate into buried deposits. Effects can also occur from cattle rubbing against standing walls or rock art panels resulting in walls collapsing or rock art panels being damaged. Bedding down adjacent to walls can weaken their foundation. Bedding down on features in general can result in soil compaction and vegetation disturbance—exposing surface artifacts and features as well as buried archaeological deposits to increased erosion. Because cattle tend to congregate near water and salting locations, the proximity of these areas to known archaeological sites was considered.

**Alternative 1** – Under this alternative, grazing would be phased out of the allotment over a 3-year period. In the interim 3 years, effects to heritage resources would be similar to current management (described in Alternative 2), but would decrease as cattle are removed from the allotment. Direct effects (such as incidental trampling of artifacts, trailing, etc.) would be short term as cattle would be completely removed from the allotment within 3 years.

During the 3 years of grazing reduction in the allotment, heritage resource site conditions would continue to be monitored to determine effectiveness of mitigations and to identify any problems that may need to be addressed. Any removal of improvements (such as fences or pipelines) would require additional heritage resource survey and clearance prior to initiation of activities. Overall, the effects of this alternative on heritage resources are anticipated to be minimal.

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<sup>4</sup> A feature can include standing walls, rock alignments, rock art panels, hearths, rubble mounds, etc. Generally, a feature is defined as a more “permanent” or immovable part of a site—something that cannot be easily picked up and moved. In contrast, an artifact (a piece of pottery, a stone tool, a bead, etc.) is not a permanent fixture in an archaeological site. In all cases, artifacts and features have been modified or constructed by humans.

Ultimately, once cattle are completely removed, there would be no cattle related effects on the 21 sites listed on the National Register of Historic Places and on the 1,900 other sites present on the allotment. While it is possible for some unauthorized cattle grazing to continue along the boundary of Jemez Pueblo and Pajarito Pasture (with low numbers of cattle drifting onto the forest from tribal land due to ineffective fencing), few sites are located in this area and no damaging effects are anticipated.

**Alternative 2** – Under current management, 21 sites listed on the National Register of Historic Places and approximately 1,900 additional sites fall within pastures that would be<sup>5</sup> included in the annual rotational system.

Monitoring data indicate that out of 218 sites (11 percent of the total number of sites) inspected for evidence of cattle grazing, 134 showed minimal signs of cattle presence, generally in the form of scattered footprints, some manure or, in some cases, an actual cow(s) was observed. For the majority of these 134 sites, however, the mere presence of cattle was not resulting in an adverse effect on sites.

This was not the case on 17 of the 134 sites. On these sites, the effects of cattle grazing were noticeable and of concern. Water troughs were observed within the boundaries of two sites and adjacent to a third site, resulting in congregation of higher numbers of cattle for longer durations. One of these sites is a historic logging camp listed on the National Register of Historic Places, another is a field house site with standing walls. The concentration of cattle in and around these water troughs/archaeological sites has resulted in soil compaction, trailing, and erosion on the sites due to lack of vegetation. These conditions allow for potential displacement and/or breakage of surface artifacts, modification of surface features, and cattle could potentially affect the site with standing walls.

On 14 sites, one or more of the following effects were noted: established cattle trails through sites boundaries, a couple of broken surface artifacts, and cattle bedding down on top of or adjacent to features. Three of these sites are prehistoric pueblos listed on the National Register of Historic Places, and several of the sites have standing walls or other surface features that could be damaged by concentrated cattle use.

While cattle grazing in general does not appear to be adverse, with respect to the 17 sites noted above, the concentration of cattle in these areas has had an adverse effect on heritage resources. These effects would be expected to continue under current management.

**Alternative 3** – under the proposed action, the fence dividing Upper and Lower Virgin Pastures would be moved about 1.5 miles south of its current location. Approximately 1,000 acres of Lower Virgin Pasture (primarily within Management Area I) would be added to Upper Virgin Pasture and the remaining portion of Lower Virgin Pasture would be permanently closed to grazing. Lower Virgin Pasture contains about 323 sites, 5 of which are listed on the National Register of Historic Places. While the pasture was not officially closed to grazing, it has not been included in the regular rotation system of the allotment for many years due to lack of water. As such, there has been little recent cattle presence on these 323 sites. Moving the pasture boundary south would transfer about 130 sites (including 2 national register sites) into the regular rotation

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<sup>5</sup> For the past several years, Fenton, Virgin Canyon, and Lower Virgin Mesa Pastures have not been grazed; however, they are available for use in situations such as drought, wildfire, etc.

system and permanently remove about 200 sites (including 3 national register pueblos) from the rotational grazing system. This alternative would also permanently closed Virgin Canyon from grazing. Approximately 23 sites (including 1 national register logging camp) are within this pasture.

Thus, under this alternative, 4 of the 21 sites listed on the National Register of Historic Places and approximately 220 of the 1,900 known sites would fall within areas where grazing would not be permitted.

Elements of the proposed action including mitigation measures were developed for the purpose of lessening or preventing effects associated with cattle grazing on sites. These include removing water troughs from within site boundaries, salting away from sites, locating range structures to avoid concentration of livestock on archaeological sites, and periodically inspecting existing facilities to ensure no effects to heritage resources are occurring. Specific mitigations (Appendix A) were identified for the 17 sites described under Alternative 2. These include activities such as rehabilitating cattle trails, dropping slash within site boundaries to deter cattle from bedding down on or adjacent to features, and constructing short segments of fence to deter cattle access to some sites. Additionally, a monitoring program has been proposed to ensure mitigations have been implemented effectively, as well as to identify and address any new or potential effects to sites related to cattle management.

With respect to specific proposed facilities (corrals, fences and fence crossings, cattle guards, water developments, and pipelines), a heritage resource records check was conducted to identify if the areas surrounding the proposed facilities had been previously surveyed and if any sites were located in the vicinity of the facilities. Those areas where no previous survey had been conducted were 100 percent surveyed by professional archaeologists.

Moving the pipeline and relocating two existing water troughs in Holiday Pasture would protect heritage resources currently being affected by placement of the existing troughs. While the areas encompassed by this project have been previously surveyed, a monitor will be required to be present during project activities within site boundaries (removal of water troughs); the monitor would also field inspect the new locations to ensure that no sites would be affected.

Installation of fence walk-throughs and ATV cattle guards would not affect any heritage resources. Similarly, new fence construction in the Fenton Pasture (one-half mile), Virgin side canyons (one-half mile), and School House Pasture (3 miles), as well as fence reconstruction between Cebollita and Porter Pastures (3 miles) and allotment boundary fence adjacent to tribal lands (6 miles) would have no effect on heritage resources.

The proposed new pipeline and water troughs in Schoolhouse and Porter Pastures were surveyed and several sites are located in the area. An archaeologist would monitor project activities in the vicinity of sites to ensure no sites would be adversely impacted by project activities (Harper 2003). The proposed water developments in Joaquin Pasture (4) and Pajarito Pasture (2) would not affect heritage resources. The proposed corral location in Joaquin Pasture falls within an area that was previously surveyed and no sites would be disturbed by construction of this facility.

Palomares Pasture has little previous survey; however, based on the results of scant previous surveys it is estimated that hundreds of unrecorded sites may be present. As such, the proposed fence line and three tank locations were surveyed but much of the area surrounding these locations has not been surveyed. While improvements would not be constructed on or adjacent to

any known sites, it is unknown what effect these improvements may have on overall grazing patterns in the pasture, particularly how they would influence where cattle congregate. Because so few sites have been recorded, there is potential for cattle to congregate on sites that are currently unrecorded. It is recommended, due to lack of overall survey and site data, that a monitoring plan be developed specific to this pasture.

Provided mitigations and monitoring are implemented, the effects to heritage resources associated with cattle grazing and associated facilities are expected to be minimal and, therefore, no adverse effects to heritage resources are anticipated.

**Alternative 4** – this alternative was developed specifically to address heritage resources. Under this alternative, Holiday Pasture (encompassing 326 sites including 3 national register sites) would be closed to grazing. The fence between Upper and Lower Virgin would not be moved and Lower Virgin Pasture (encompassing 323 sites including 5 national register site) would be permanently closed, as would Virgin Canyon Pasture (encompassing 23 sites including 1 national register site).

Thus, under this alternative, 9 of the 21 sites listed on the National Register of Historic Places and approximately 670 of the 1,900 known sites would fall within areas where grazing would not be permitted. Five of the 17 sites identified through monitoring that exhibited adverse effects would be excluded from grazing. Similar to Alternative 3, all mitigations and monitoring previously discussed would be implemented under this alternative.

This alternative would represent the least amount of potential effects resulting from cattle grazing among the action alternatives. With implementation of mitigations, no adverse effects to heritage resources would be anticipated.

### **Cumulative Effects**

As described in the *Affected Environment* section, the area encompassed by San Diego Allotment has been exposed to centuries of human use and alteration. The combination of wildfires, historic grazing, recreation use, historic logging and associated road building all directly and indirectly contributed to the current condition of sites on the allotment today. Heritage resources are nonrenewable, that is once they have been damaged (ex: excavated, artifacts collected, or a wall knocked over) the effects cannot be reversed. Thus, with respect to cumulative effects, past management actions generally do not contribute to ongoing cumulative effects with the exception of ongoing erosion caused by past uses.

It is relevant, however, to consider current and reasonably foreseeable management when considering the effects they may have in combination with permitted grazing. Ongoing and proposed recreation activities (particularly in riparian areas) and road management have the highest potential to contribute to the effects on heritage resources. Sites in popular dispersed recreation areas are often disturbed by casual artifact collectors, campers using rubble from features for campfire rings, and wood from historic features for firewood. Additionally, many dispersed recreation users pull off main roads and travel cross country to access out-of-the-way campsites. As a general rule, places desirable to people today were also desirable to people in the past; therefore, people often drive across, park, and camp on top of historic and prehistoric sites. The riparian pastures of the San Diego Allotment are popular recreation destinations. These pastures also have a very high density of archaeological resources. Cumulatively, reducing the

amount of grazing in riparian pastures combined with other projects being conducted, such as closing user-created roads and controlling recreation use under the “Respect the Rio” project, would result in less ground disturbance (potential for erosion) and, thus, less potential for damaging effects on archaeological sites.

## Recreation and Scenery

### Affected Environment

Most recreation users come to the Jemez Ranger District for relief from summer heat, family outings, and vacations. Most of the developed and about 50 percent of the dispersed recreation use on the Jemez Mountains occurs in the Jemez National Recreation Area. A large portion of the Jemez National Recreation Area falls within the San Diego Allotment primarily along State Highways 4 and 126 and Forest Road 376. These corridors encompass the key recreational features of the Jemez, Guadalupe, and Cebolla Rivers and scenic canyon landscapes. Developed recreation use occurs along State Highways 4 and 126 at three campgrounds, four picnic grounds, one trailhead and seven angler-parking areas. These areas are closed to grazing.

Over the past decades, population growth in urban communities surrounding the Jemez Mountains (Santa Fe, Rio Rancho, Albuquerque) has led to increases in dispersed recreation activities including: camping, picnicking, fishing, mountain biking, hunting, hiking, and off road (ATV) recreating. A recent inventory of the Rio Guadalupe and Rio Cebolla corridors within the San Diego Allotment identified 52 dispersed recreation complexes. These sites frequently contained more than one camp area—some were documented to have up to 20 campfire rings. Access to these dispersed sites is along nonsystem, user-created roads that run through open meadows and along streambanks. This off-road-vehicle travel and dispersed camping has led to changes in vegetation composition, increased soil compaction, and destabilization of streambanks. In an effort to address the problems associated with heavy dispersed recreation use, the forest has initiated the “Respect the Rio” program. This program focuses on personally contacting and educating recreation users in the area. Also proposed are projects designed to restrict access to streambanks by designating roads and parking areas while closing and reclaiming user-created roads (USDA FS 2003b).

In the San Diego Allotment, cattle are completely excluded from the Jemez River and are administratively restricted from the remaining high use riparian recreation areas between Memorial Day and Labor Day. As such, the potential for conflicts related to the presence of cattle and fresh manure in these dispersed recreation sites is greatly reduced.

Because the San Diego Allotment overlaps a large portion of the Jemez National Recreation Area, there was a lot of discussion related to range management during development of the Jemez National Recreation Area Management Plan. During the initial public comment period for the management plan, May 1997 – April 1999, 8 public meetings were held (2 in Cañon, 3 in Santa Fe, 1 in Bernalillo, and 2 in Los Alamos) and attended by a total of 104 participants. With over a couple hundred comments received, only three comments suggested eliminating cattle use in the Jemez National Recreation Area. These three comments were specific to elimination of grazing in riparian areas. Other comments received during these public meetings supported livestock use in riparian areas or throughout the Jemez National Recreation Area provided such use was ecologically sound and minimized conflicts with recreational users. Similar comments appeared

in letters received during that time period, with a very small percentage of the letters suggesting that livestock grazing be eliminated in the Jemez National Recreation Area.

In the last 5 years, the Santa Fe National Forest enacted more restrictive cattle controls to protect riparian areas and minimize conflicts with recreational users. In this same time period, fewer than five formal complaints have been received from the public concerning grazing in the Jemez National Recreation Area (including areas outside the San Diego Allotment encompassing the East Fork Wild and Scenic River). During this period, it is estimated that several million recreational users have visited the Jemez National Recreation Area. This equates to less than one complaint per year, or less than one complaint per one and a half million visitors. As such, the current level of livestock use and the timing of this use appears to be very compatible with the high recreation use experienced within the Jemez National Recreation Area and surrounding areas.

## **Environmental Consequences**

**Alternative 1** – Eliminating cattle from the allotment would eliminate the infrequent recreation/cattle conflicts that may occur in dispersed recreation areas outside of peak use periods.

**Alternative 2** – This alternative would not address the objective to reduce/eliminate cattle drifting into high use dispersed recreation areas between Memorial Day and Labor Day due to inadequate fencing and gates left open, because no facilities (cattle guards or fence crossings) are proposed. Cattle would likely continue to periodically drift into high use riparian pastures during peak recreation periods. Their presence would be short term as the permittees would be contacted and told to remove the cattle from the area. Recreation/cattle conflicts would have little effect on recreation experience because data from the past 5 years (described in the *Affected Environment* section) indicate recreation/cattle conflicts are infrequent.

**Alternatives 3 and 4** – Construction/reconstruction of fences, installation of cattle guards and fence crossings (allowing pedestrian and equestrian access) are proposed under these alternatives. These proposed facilities would address the objective of reducing/eliminating cattle drifting into high use dispersed recreational areas between Memorial Day and Labor Day. Ensuring that recreation users have easy access through fences would minimize the inconveniences to hikers and equestrian users. Employing mitigation measures that require use of native or naturally appearing materials in the construction of range facilities would minimize the disruption to scenery values.

## **Cumulative Effects**

Direct and indirect effects to recreation resulting from cattle grazing are expected to be minimal. Constructing facilities under Alternatives 3 and 4 that would reduce the infrequent cattle/recreation conflicts, combined with the comprehensive riparian restoration projects planned to address riparian recreation impacts under the “Respect the Rio” project would provide for an overall better recreation experience in a healthier riparian ecosystem.

## Economic Analysis

Economic efficiency and financial efficiency are defined in Forest Service Handbook (FSH) 1909.17. Economic efficiency is determined by present net value (PNV) for all partners in the project for the planning period. Present net value is the sum of all income sources less all expenses over a given period at current prices (dollars). In this case, the partners are the Forest Service, grazing permittee and an unknown grantor. Financial efficiency is determined by PNV for the Forest Service. A benefit/cost (B/C) ratio is also determined as part of the analysis process for range management projects.

This analysis is based on the standard 10-year period covered by a term grazing permit beginning in 2005 with the following assumptions:

- The analysis is based only on those values that can have a cash value readily assigned;
- The average number and class/type of livestock authorized to graze and the average season of use is reflected by information in current term grazing permits, unless identified otherwise in a specific alternative description within the environmental impact statement; and
- Range inspections, permit administration and range maintenance will only continue so long as there is grazing.

The Forest Service has mandates and management objectives that are not easily quantified for economic analysis; some of our partners operate under similar circumstances. Therefore, economic and fiscal analysis results are not a primary determining factor in land management decisions. The no grazing alternative is the baseline for this analysis.

**Table 17. Economic and Financial Analysis Results**

	<b>Alternative 1, No Grazing</b>	<b>Alternative 2, Current Management</b>	<b>Alternative 3, Proposed Action</b>	<b>Alternative 4, Eliminate Holiday Pasture</b>
Economic Efficiency	-\$217	\$45,480	-\$50,121	-\$46,281
Economic B/C	1.01	1.23	0.84	0.85
Financial Efficiency	-\$12,765	-\$102,334	-\$132,520	-\$130,320
Financial B/C	0.17	0.21	0.17	0.17

### Cumulative Effects

No other projects in this area would have an effect on these analyses.

## Social Background and Environmental Justice

Executive Order 12898 (1994) requires Federal agencies to address environmental justice of their actions on minority and low-income populations. This analysis considered demographic, economic, and human health risk factors.

## Affected Environment

The San Diego Allotment serves as a critical link in the overall cow/calf grazing program for nine families who are included in the San Diego Cattlemen's Cooperative Association. On average, 128 mature cattle (117 cows, 12 bulls) graze the area year-round, while an additional 136 cows graze during summer months only. Typically 136 cows are moved to private or Bureau of Land Management leased lands during winter months.

Association members who graze cattle in the allotment primarily reside in the surrounding communities of Jemez Springs, Cañon, Gilman, Ponderosa, Rio Rancho and Albuquerque, and continue to have strong ties to the area. They typically own small ranches (<50 acres) and their permits to graze most of their cattle on public lands year-round are integral to their overall operations.

These families have long histories and ties to the use of these lands dating back to Spanish land grants and colonization of the area. These operations are not large industrial beef producers; rather they are small subsistence style ranching operations that provide food for the family. For some association members, the money generated through cattle is a secondary source of income, for others it is their main source of income. For permittees in northern New Mexico, grazing cattle contributes to a sense of personal identity, prestige within the community, pride of lifestyle, and a feeling of self-sufficiency. Maintaining this traditional way of life helps create a strong sense of community and family values.

Until the mid 1960s, what is now the San Diego Allotment was part of a land grant that provided grazing for area residents associated with the San Diego Land Grant. Modern grazing systems were largely unheard of. Rather, individual families grazed certain areas of the forest based on water and forage availability. Cattle and sheep tended to be scattered about in loosely defined geographical areas. Little regulation of grazing existed and little attempt was made to determine carrying capacity of the land.

Once the allotment became public land, area residents who could prove they historically grazed the area were required to become organized into a grazing association and graze cattle under the Forest Service permit system which defined the terms and conditions of its use. Key components of those terms and conditions were to define carrying capacity of the land and establish grazing systems to provide for the long-term sustainability of the land. Areas in poor condition due to overgrazing were defined and objectives set to bring these areas into a healthy condition. When cattle were permitted back onto the allotment, it was at an 80 percent reduction from historic levels.

Today, emphasis on protecting threatened and endangered species, providing high water quality and quantity, enhancing riparian and upland habitat, and providing high quality recreational experiences, has resulted in placing restrictions on how and where livestock grazing is conducted. Over the past decade, the association has adjusted their operations to accommodate alternative resource uses and reduce conflicts.

## Environmental Consequences

**Alternative 1** – eliminating grazing would result in an economic and cultural hardship to the families relying on this allotment for income and cultural identity. This alternative would not meet the objective of contributing to social and economic needs associated with grazing in

northern New Mexico and, thus, would not be in accordance with Forest Service policy (FSM 2202.1(4)) and the Santa Fe National Forest Plan (USDA FS 1987b).

Closing the allotment and terminating the grazing permit would impact the permittees traditional livestock operations and may foreclose the permittee's grazing options. Closing the allotment may save taxpayers money but under the no grazing alternative, costs would still be incurred for construction and continued maintenance of boundary fences needed to control trespass from adjacent private and tribal lands. Should the forest select to retain existing water developments for the wildlife that currently relies on them, they would have to be maintained. This would become the responsibility of the Forest Service and not the permittee, who currently maintain all fences and water developments on the allotment.

**Alternatives 2-4** – would not result in adverse or disproportionate effects on low income or minority populations. These alternatives are consistent with activities implemented on National Forest System lands throughout the United States over the past several decades. As such, the environmental effects are predictable as are the outcomes of implementing mitigation measures that have been refined over the years. There would be no displacement of minorities, changes of land use, or increases in taxes that would constitute an economic hardship. There would be no negative effects on public health.

## Short-term Uses and Long-term Productivity

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 C.F.R. 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Short-term uses are those that generally occur annually, in this case, livestock grazing. Thus, long-term productivity would refer to the ability of the land to produce a continuous supply of forage to support cattle grazing. Forage availability is dependent upon soil condition. The continuation of grazing on the San Diego Allotment as described in the action alternatives is not expected to affect the long-term productivity of soils or any other resources as described in Chapter 3.

## Unavoidable Adverse Effects

None of the proposed activities under the four alternatives would result in unavoidable adverse environmental effects on soil, vegetation, water, riparian, air, wildlife, fish, recreation or scenic values.

With respect to heritage resources, Alternative 1 would result in no effect to heritage resources. Authorizing cattle grazing under current management (Alternative 2) would not address ongoing adverse effects (resulting from heavy concentrations of cattle within site boundaries on several archaeological sites), as such, this alternative would result in continued adverse effects to these sites. Implementing mitigations and elements of the proposed action (such as removing water

developments currently located within site boundaries) under Alternatives 3 and 4 would result in no adverse effects to heritage resources.

## **Irreversible and Irretrievable Commitments of Resources**

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road. With respect to livestock grazing, the main resource involved is forage. Forage is considered a renewable resource, particularly when utilization is managed at conservative levels (31-40 percent utilization), as authorized under Alternatives 2-4. Therefore, there would be no irreversible or irretrievable commitments of resources anticipated under any of the alternatives.

In some situations the loss of heritage resources would be considered irreversible. That is, once an archaeological site has been destroyed, it is gone forever. However, in the context of grazing management on the San Diego Allotment, the effects noted on sites were limited to disturbance/alteration of surface or near surface materials. While these effects are considered adverse in the context of heritage resource management, all scientific information is not lost because the entire site is generally not impacted or destroyed. For example, cattle grazing may result in damage to some (but not all) surface artifacts (breakage of stone flakes or pottery sherds) and features (knock down walls or displace rubble), while leaving other components of the site unaffected. The majority of sites within this particular allotment have buried deposits that are not affected by cattle grazing—thus the entire site would not be destroyed by grazing unless the grazing was to occur at such an extent that severe erosion occurs and subsurface deposits are destroyed. Such extreme effects are not occurring on any sites within the allotment as shown through monitoring of 218 sites. Furthermore, utilization at such extreme levels to allow for this type of damage is not currently permitted, nor would it be permitted under any of the alternatives. As such, in this context, the effects to heritage resources are not irreversible.

## **Other Required Disclosures**

NEPA at 40 C.F.R. 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with ... other environmental review laws and executive orders.”

The proposed action and alternatives are consistent with direction in the Santa Fe National Forest Plan and the Jemez National Recreation Area Management Plan. No conflicts with plans or policies of other jurisdictions are anticipated under any alternative.

Authorization of grazing is in compliance with the Endangered Species Act and the National Historic Preservation Act. The Forest Service has initiated consultation with the U.S. Fish and Wildlife Service and the State Historic Preservation Office specific to this project. Consultation with these agencies would be complete prior to issuing a final environmental impact statement and record of decision.



# Chapter 4. Consultation and Coordination

## Preparers and Contributors

The following individuals participated in the interdisciplinary analysis leading to the preparation of this draft EIS.

<b>Name</b>	<b>Position</b>	<b>Contribution</b>	<b>Education</b>	<b>Years Experience</b>
Rita Skinner	Natural Resource Coordinator	Project Leader/Heritage Resources	M.A., Anthropology B.S., Anthropology	13
Derek Padilla	Range	Range Analysis	B.S., Range Management	10
Jo Wargo	Wildlife Biologist	Wildlife	M.S., Wildlife Biology B.S., Biology	13
Erica Nevins	Soil Scientist/Hydrologist	Soil and Water	B.S., Soil Science	5
Barry Imler	Forest Range Program Mgr.	Economic Analysis, Range Review	B.S. Renewable Natural Resources; M.S. Watershed Management	13
Mike Bremer	Forest Archaeologist	Heritage Resources	B.A. Anthropology; M.A. Anthropology	28

Additional Forest Service personnel were consulted at various phases of the analysis and are listed below:

### Recreation and Scenery Resource Information

- Ruth Doyle, Assistant Recreation Staff, Santa Fe National Forest (2000)
- Sherry Gaston, former Recreation Staff, Cuba Ranger District (2000-2002)

### Range Resource Information

- Travis Mosely, former Range Staff, Jemez Ranger District (1999-2001)

### Heritage Resources

- Cheryl Harper, Archaeological Technician, Jemez Ranger District (2000-2002)

### NEPA Assistance and Review

- Susan Bruin, Santa Fe National Forest Planner
- Allen Fowler, Santa Fe National Forest NEPA Coordinator

### Fisheries

- Sean Ferrell, Fisheries Biologist, Santa Fe National Forest (2003-2004)

### Soil and Water

- Anna Jaramillo Scarborough (1999-2002)

## Distribution of the Draft Environmental Impact Statement

This draft environmental impact statement has been distributed to individuals who specifically requested a copy of the document and those who submitted comments in response to scoping. In addition, copies have been sent to the following Federal agencies, Federally recognized tribes, State and local governments, and interested organizations.

### Federal Agencies

Advisory Council on Historic Preservation

USDA APHIS PPD/EAD  
Riverdale, MD

Natural Resource Conservation Service  
Washington, DC

USDA, National Agricultural Library  
Beltsville, MD

BLM NM State Office  
Santa Fe, NM

National Marine Fisheries Service  
Long Beach, CA

U.S. Army Engr., Southwestern Division  
Dallas, TX

U.S. Environmental Protection Agency  
Washington, DC

EPA Regional Office  
Dallas, TX

U.S. Department of Interior  
Washington, DC

Intermountain Region, NPS  
Lakewood, CO

U.S. Coast Guard  
Washington, DC

Federal Aviation Administration  
Fort Worth, TX

Federal Highway Administration  
Olympia Fields, IL

U.S. Fish and Wildlife Service  
Albuquerque, NM

### Tribes

Pueblo of Jemez – Governor  
Jemez Pueblo, NM

Pueblo of Jemez - Department of Resource  
Protection  
Jemez Pueblo, NM

Pueblo of Santo Domingo – Governor  
Santo Domingo, NM

Pueblo of Cochiti – Governor  
Cochiti Pueblo, NM

Pueblo of Zia – Governor  
Zia Pueblo, NM

### State Agencies

New Mexico Department of Game and Fish  
Albuquerque, NM

New Mexico State Historic Preservation  
Office  
Santa Fe, NM

New Mexico Environment Department  
Santa Fe, NM

### Local Governments

Sandoval County Commissioners  
Bernalillo, NM

### Organizations

Center for Biological Diversity  
Tucson, AZ

Forest Guardians  
Santa Fe, NM

National Audubon Society  
Santa Fe, NM

New Mexico Trout  
Albuquerque, NM

New Mexico Natural History Institute  
Santa Fe, NM

Rocky Mountain Elk Foundation  
Rio Rancho, NM

Forest Trust  
Santa Fe, NM

Nature Conservancy  
Santa Fe, NM

Forest Conservation Council  
Santa Fe, NM

Sangre de Cristo Audubon Society  
Los Alamos, NM

Sierra Club  
Los Alamos, NM

Southwest Forest Alliance  
Flagstaff, AZ

Santa Fe Forest Council  
Santa Fe, NM

Sierra Club – Santa Fe Group  
Santa Fe, NM

Save the Jemez  
Albuquerque, NM

Sierra Club National Forest Campaign  
Santa Fe, NM

## **Individuals**

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Antonio Lucero  
Jemez Pueblo, NM

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Candido Trujillo  
Ponderosa, NM

Willie Trujillo  
Ponderosa, NM

Ramon Trujillo  
Ponderosa, NM

Larry Trujillo  
Albuquerque, NM

Ivan Trujillo  
Jemez Pueblo, NM

Henry Trujillo  
Ponderosa, NM



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# Appendix A

## Site Specific Mitigations and Monitoring Requirements for Heritage Resources

Based on the results of a heritage monitoring program (Skinner and Harper, 2003), the following mitigation and monitoring requirements will be implemented under Alternatives 3 and 4. Specific on-the-ground treatments will be phased in over a three year period with priority for site treatments being established by the Jemez District Archaeologist. An archaeologist will be present when activities are being conducted within site boundaries. The effectiveness of mitigations will be assessed in the two years following implementation. If the mitigations are deemed successful, further annual monitoring will not be required.

### Mitigation and Monitoring – National Register of Historic Places

Monitor all sites listed on the National Register of Historic Places and mitigate adverse effects as described in the following table.

Site No. AR-03-10	Site Type	Monitoring Result	Pasture Name	Open to Grazing	Recommended Mitigation	Recommended Monitoring
03-1	pueblo	no evidence of cattle observed	Guadalupe	Yes	None	Every 2 years
03-2	pueblo	manure present but no cattle damage to site.	Lobo	Yes	None	Annual
03-3	pueblo	not accessible to cattle	Lower Virgin	No	None	Every 2 years
03-7	pueblo	manure present but no cattle damage to site.	Holiday	Alt 3 - yes Alt 4 - no	None	Annual
03-8	pueblo	manure present but no cattle damage to site.	Palomares	Yes	None	Annual
03-11	pueblo	manure present but no cattle damage to site.	Holiday	Alt 3 - yes Alt 4 - no	None	Annual
03-199	pueblo	manure present but no cattle damage to site.	Lobo	Yes	None	Annual
03-504	pueblo	manure present but no cattle damage to site.	Lobo	Yes	None	Annual
03-530	pueblo	not accessible to cattle	Lower Virgin	No	None	Every 2 years

Site No. AR-03-10	Site Type	Monitoring Result	Pasture Name	Open to Grazing	Recommended Mitigation	Recommended Monitoring
03-574	pueblo	bedding down in plaza, hoof prints, some erosion	Palomares	Yes	drop slash in plaza area to deter cattle bedding down	Implementation monitoring followed by annual
03-575	pueblo	trails, bedding down within site, hoof prints	Palomares	Yes	drop slash in plaza area to deter cattle bedding down. block cattle trail with slash, re-route cattle outside of boundary	Implementation monitoring followed by annual
03-576	pueblo	manure present but no cattle damage to site.	Porter	Yes	None	Annual
03-578	pueblo	not accessible to cattle	Lower Virgin	No	None	Every 2 years
03-579	pueblo	manure present but no cattle damage to site.	Palomares	Yes	None	Annual
03-647	pueblo	manure present but no cattle damage to site.	Lobo	Yes	None	Annual
03-688	pueblo	Cattle bedding down in plaza	Palomares	Yes	Drop slash in plaza area to deter cattle bedding down	Implementation monitoring followed by annual
03-745	historic structure	No evidence of cattle. Structures associated with camp burned in 2003 Virgin wildfire	Upper Virgin	Yes	None	Every 2 years

<b>Site No. AR-03- 10</b>	<b>Site Type</b>	<b>Monitoring Result</b>	<b>Pasture Name</b>	<b>Open to Grazing</b>	<b>Recom- mended Mitigation</b>	<b>Recom- mended Monitoring</b>
03-825	historic structure	currently not accessible to cattle (under the proposed action site would become part of Upper Virgin pasture)	Lower Virgin	Alt 3 - yes Alt 4 - no	None	Every 2 years
03-900	historic structure	not accessible to cattle	Lower Virgin	Alt 3 - yes Alt 4 - no	None	Every 2 years
03-983	historic structure	not accessible to cattle	Virgin Canyon	No	None	Every 2 years
03-2624	historic structure	Cattle bedding down within site, deep trails, water trough in site boundary. Portions of site burned in Holiday wildfire (1990s)	Holiday	Alt 3 - yes Alt 4 - no	Remove water trough from site boundary, rehabilitate trails.	Implementa- tion monitoring, annual effectiveness monitoring for first 2 years, then every 2 years

### Mitigation and Monitoring – Other sites

Monitor the following sites and mitigate known adverse effects as described in the following table. Recommend mitigations shown in the table may be modified by an archaeologist onsite as needed to achieve the goal of protecting the site.

Site No. AR-03-10	Site Type	Monitoring Result	Pasture Name	Open to Grazing	Recommended Mitigation	Recommended Monitoring
03-271	Historic structure	Deep eroded cattle trails noted	Lower Lake Fork	yes	Block cattle trail with slash, re-route cattle outside of boundary	Implementation monitoring, annual effectiveness monitoring for first 2 years
03-291	Prehistoric ceramic scatter	Cattle trail with broken sherd, Cass tank is located nearby	School House	yes	Block cattle trail with slash, re-route cattle outside of boundary	Implementation monitoring, annual effectiveness monitoring for first 2 years
03-498	fieldhouse	Hoof prints south of field house with partial standing wall	Palomares	yes	Place slash adjacent to wall to deter cattle access	Implementation monitoring, annual effectiveness monitoring first 2 years
03-943	fieldhouse	Hoof prints, manure, kicked stones, water trough in site boundary	Porter	yes	Remove water trough from site boundary	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1043	fieldhouse	Cattle trailing near partial standing wall	Guadalupe	yes	Place slash adjacent to wall to deter cattle access	Implementation monitoring, annual effectiveness monitoring first 2 years

Site No. AR-03-10	Site Type	Monitoring Result	Pasture Name	Open to Grazing	Recommended Mitigation	Recommended Monitoring
03-1461	fieldhouse	Bedding down near rubble mound, stable cattle trail present on site	Lower Lake Fork	yes	Place slash on mound to deter cattle from bedding down	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1623	pueblo	Hoof prints and manure near edge of room block	Cebolla	yes	Place slash near edge of room block to deter cattle traffic	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1715	Historic structure	Bedding down adjacent to cabin, manure present	Pajarito	yes	Place slash adjacent to cabin to deter cattle access	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1912	fieldhouse	Burned in Henry wildfire, little vegetation, cattle trail through the area adding to effects	Holiday	Alt 3 - yes Alt 4 - no	Place slash, seed, or mulch to help stabilize the ground surface	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1939	fieldhouse	Water trough near site with standing walls	Holiday	Alt 3 - yes Alt 4 - no	Move water trough well away from site boundary	Implementation monitoring, annual effectiveness monitoring first 2 years
03-1942	Prehistoric artifact scatter	10 cm deep cattle trail through site	Holiday	Alt 3 - yes Alt 4 - no	Stabilize trail and reroute around site	Implementation monitoring, annual effectiveness monitoring first 2 years

<b>Site No. AR-03- 10</b>	<b>Site Type</b>	<b>Monitoring Result</b>	<b>Pasture Name</b>	<b>Open to Grazing</b>	<b>Recom- mended Mitigation</b>	<b>Recom- mended Monitoring</b>
03- 2489	fieldhouse	Standing walls present, no cattle effects noted but there is potential to bed down near the walls	Holiday	Alt 3 - yes  Alt 4 - no	Place slash adjacent to standing walls to deter cattle from bedding near them	Implemen- tation monitoring, annual effectiveness monitoring first 2 years
03- 2713	fieldhouse	Heavily used trail located east of rubble mound – no standing walls	Guadalupe	yes	Stabilize trail and reroute around site	Implemen- tation monitoring, annual effectiveness monitoring first 2 years

# Appendix B - Maps



