



United States  
Department of  
Agriculture

Forest Service



Santa Fe  
National Forest,  
Region 3

September 2009

# ENVIRONMENTAL ASSESSMENT

## CAJA DEL RIO GRAZING ALLOTMENT

Project Number: 25902

Espanola Ranger District

Santa Fe National Forest

Santa Fe County, New Mexico

*The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) Should contact USDA's target center at 202-720-2600 (voice and TDD).*

*To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-w, Whitten Building, 1400 Independence Ave. SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD).*

*USDA is an equal opportunity provider and employer*

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

SOUTHWESTERN REGION

SANTA FE NATIONAL FOREST

ESPAÑOLA RANGER DISTRICT

SANTA FE COUNTY, NEW MEXICO

CAJA DEL RIO GRAZING ALLOTMENT

ENVIRONMENTAL ASSESSMENT

Responsible Official:

Sandy Hurlocker, District Ranger  
Española Ranger District  
P.O. Box 3307 Fairview Station  
Española, NM 87533

For Information Contact:

Donald Serrano, Range Staff  
Española Ranger District  
P.O. Box 2207  
1710 Riverside Drive  
Española, New Mexico 87533  
Phone: (505) 753-7331  
[dlserrano@fs.fed.us](mailto:dlserrano@fs.fed.us)

Table of Contents

<b>CHAPTER 1 - PURPOSE AND NEED FOR ACTION</b>	<b>1</b>
<hr/>	
INTRODUCTION	1
PURPOSE AND NEED FOR THE PROPOSED ACTION	1
THE PROPOSED ACTION	2
LOCATION, SETTING AND BACKGROUND	2
DESIRED CONDITIONS	3
PUBLIC INVOLVEMENT	4
DECISION FRAMEWORK	5
<b>CHAPTER 2 – ALTERNATIVES CONSIDERED</b>	<b>9</b>
<hr/>	
ALTERNATIVES ELIMINATED FROM DETAILED STUDY	9
FORMALATION OF ALTERNATIVES	9
DESCRIPTIONS OF ALTERNATIVES CONSIDERED IN DETAIL	9
MITIGATION MEASURES	11
MONITORING	13
<b>CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS</b>	<b>16</b>
<hr/>	
INTRODUCTION	16
BACKGROUND	16
GRAZING MANAGEMENT	18
SOILS & WATERSHED	19
AIR QUALITY	24
VEGETATION	25
THREATENED, ENDANGERED, AND SENSITIVE SPECIES	28
MIGRATORY BIRDS	31
MANAGEMENT INDICATOR SPECIES (MIS)	31
RECREATION	32
CULTURAL RESOURCES	34
ENVIRONMENTAL JUSTICE AND SOCIAL ECONOMICS	35
<b>CHAPTER 4 – CONSULTATION AND COORDINATION</b>	<b>38</b>
<hr/>	
APPENDIX A - REFERENCES	39
APPENDIX B – EXISTING AND DESIRED CONDITIONS	41
APPENDIX C – RESPONSES TO PUBLIC CONCERNS	47

**List of Tables**

Table 1 - Allotment Use and Facilities	18
Table 2 - Grazing intensity guidelines	19
Table 3 - Caja del Rio grazing allotment Authorize and Actual Livestock Use	19
Table 4 - 6th Code Watersheds within the Caja del Rio grazing allotment	20
Table 5 - Predicted Soil Loss and Sedimentation due to Livestock Grazing	22
Table 6 - Caja del Rio Forage Capacity Estimates	25
Table 7 - Federally Endangered Species	28
Table 8 - Regional Forester's Sensitive Species List 2007	28
Table 9 - Management Indicator Species	31

# CHAPTER 1 - PURPOSE AND NEED FOR ACTION

## INTRODUCTION

The USDA Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (40 CFR, Parts 1500 - 1508 and 36 CFR, Part 222.2) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. It also provides the supporting information for a determination to prepare either an Environmental Impact Statement or a Finding of No Significant Impact.

Additional documentation, including more detailed analyses of project-area resources, can be found in the project planning record located at the Santa Fe National Forest Supervisors Office.

The EA is organized into four chapters:

**Chapter 1 Purpose and Need for Action:** The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

**Chapter 2 Alternatives Considered:** This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the interdisciplinary team, public, grazing permittees and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

**Chapter 3 Environmental Effects:** This chapter describes the environmental effects of implementing the proposed action and other alternatives. Each resource discussion will include short-term uses, long-term productivity, and cumulative effects of each alternative proposed for implementation.

**Chapter 4 Consultation and Coordination:** This brief section provides a list of prepares and agencies consulted during the development of the environmental assessment.

**Appendices:** The appendices provide more detailed information to support the analysis presented in the preliminary assessment.

## PURPOSE AND NEED FOR THE PROPOSED ACTION

In compliance with the National Environmental Policy Act (NEPA) and 1995 Rescissions Act, the purpose of this project is to authorize livestock grazing on the Caja del Rio grazing allotment because:

1. There is Congressional intent to allow grazing on suitable lands (Multiple Use and Sustained Yield Act of 1960, Forest and Rangeland Renewable Resource Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976).
2. The National Forest System (NFS) lands within the Caja del Rio grazing allotment have been identified as suitable for domestic livestock grazing in the Forest Plan. 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 CFR 222.2).

3. It is Forest Service policy to contribute 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).

Under current grazing management the allotment is meeting or moving towards the Forest –wide goals and objectives (see page 3) in a desired timeframe. In order to continue towards these objectives, there is a need to:

- Improve range infrastructure to improve rotational grazing;
- Improve exiting water developments to enhance livestock distribution and forage utilization;
- Improve upland range condition within existing key grazing areas.

## THE PROPOSED ACTION

The Española Ranger District, Santa Fe National Forest proposes to continue to permit up to 492 head of cow/calf pairs and 28 bulls (8,305 AUMs) from March 1<sup>st</sup> to February 28<sup>th</sup> (year-long) by reissuing twelve - ten year term grazing permit. Approximately 6.2 miles of new pipeline and three water troughs are included in the proposed action to improve livestock distribution and the timing, duration and frequency to livestock use within specific areas of the allotment.

The proposed action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decisionmaking). A detailed description of the proposed action is found in Chapter 2.

## LOCATION, SETTING AND BACKGROUND

The Caja del Rio grazing allotment comprises approximately 66,873 acres of National Forest System lands (NFS) on the Santa Fe National Forest, located in T. 15 - 19 N., R. 6 - 8 E, Santa Fe & Sandoval Counties, New Mexico and is approximately 5 air miles west of Santa Fe, New Mexico. The allotment is administered by the Española Ranger District. The Forest Plan identifies the allotment as being in Management Areas: G (Wildlife-Range-Firewood) and L (Semi-Primitive, Non-Motorized Recreation). There are currently twelve permits issued on the allotment totaling 520 head of cattle yearlong. The grazing system is a four pasture deferred rotational system.

The allotment is located in the Sacramento-Monzano Mountains Section of the Arizona-New Mexico Mountains Semidesert-Open Woodland-Coniferous Forest-Alpine Meadow Province of the Arizona-New Mexico Mountains Ecoregion. The landscape consists of moderate-elevated mountains, hills, plains, and scarps. Rocks consist primarily of basalt flows from the Jemez Mountain Range. Vegetation consists of piñon-juniper and southwestern shrub-steppe cover types. Annual precipitation averages around 10 inches (McNabb et al 2007). Vegetative community types within the allotment consist largely of piñon-juniper overstory with short grass understory dominated by blue grama (65 percent) followed by open grasslands (35 percent) comprised of blue grama, galleta grass, stipa, rabbitbrush and big sagebrush.

The allotment falls entirely within the Canada Ancha-Rio Grande and Santa Fe River Watersheds (HUC 1302020102 & 1302020101) and contains portions of six separate subwatersheds. There is approximately 3 miles of perennial streams and 156 miles of intermittent drainages within the allotment. The majority of the allotment drains into the Rio Grande River which is adjacent to the northwest allotment boundary.

## DESIRED CONDITIONS

An interdisciplinary team (IDT) has identified the existing and desired conditions for this allotment based on information contained in the Santa Fe National Forest Plan, historical and current range inventories and the Terrestrial Ecosystem Survey (TES) of the Santa Fe National Forest.

### Role of the Forest Plan

The 1987 Santa Fe Forest Plan, as amended sets the goals and objectives for the management of the Santa Fe National Forest. Goals describe the desired resource condition sometime in the future and are the bases for project-level planning. The standards, guidelines, and management direction contained in the 1986 Forest Plan set parameters with which the project must take place. Approval of any management activity, such as livestock grazing, must be consistent with these parameters (16 U.S.C. 160(i)). The Forest Plan can be found at:

<http://www.fs.fed.us/r3/sfe/projects/plansReports/index.html>

Grazing activities will be authorized in a manner such that the landscape meets or moves towards goals and objectives in the Forest Plan (Forest Plan pp 17 -22). Some of the goals that apply to range management include:

- Provide a program of range management that emphasizes high quality range forage and improvements (Forest Plan, p. 19). For example, manage permitted livestock use through the implementation of water developments, fences, salting plans and grazing systems (i.e. rotational grazing) that allows for the control on the timing, duration and frequency of livestock use.
- Cooperate with private ranch owners and other agencies to develop coordinated range management systems of livestock grazing to balance permitted use and grazing capacity (Forest Plan, p. 19)
- Manage Forest activities and programs within the capability of the land while recognizing the value of maintaining the traditional cultures of northern New Mexico (Forest Plan p. 22).

Forest Plan standard and guidelines are permissions or limitations that apply to on-the-ground implementation of management activities. Forest-wide standard and guidelines related to grazing can be found on pages 50 – 97 of the Forest Plan. Additional standards and guidelines are also applied to specific Management Areas.

- Construct new and replace existing structural improvements needed to implement and maintain the range resource management level identified for each management area. Comply with construction Standards in FSM 2240, 2320, and FSH 2209.22 (Forest Plan, p 67). For example, construction of pipelines to improve livestock distribution and to reduce the amount of livestock use in riparian areas.
- Work toward improving unsatisfactory watershed condition to a satisfactory state on those acres that can be cost effectively improved [through] structural methods and management strategies such as...satisfactory allotment plans (Forest Plan, p. 76)
- Adjust riparian plan composition or structure through coordination with other uses or direct manipulation in order to achieve riparian standards (Forest Plan, p. 62). For example, maintaining or promoting the vigor of riparian plants such as willows, alders, sedges, and rushes, by controlling the timing duration and intensity of permitted livestock grazing.
- Manage riparian areas in accordance with legal requirements regarding floodplains, wetlands, wild and scenic rivers, and cultural and other resources. Protect the productivity and diversity of riparian-dependent resources and emphasize the protection of soil, water, vegetation, wildlife, and fish resources prior to implementing projects. (Forest Plan, p. 79)

Management prescriptions are applied to geographical units on the ground, which are called Management Areas (MA). Each MA has a specific management direction that highlights some of the most important direction. The Caja del Rio grazing allotment is located following Management Areas:

Management Area	Acres	Emphasis
MA G (Wildlife-Range-Firewood)	56,515	Emphasis in this area is on key wildlife habitat protection, habitat improvement, and forage and firewood production. Dispersed recreational opportunities consist of firewood and piñón nut gathering, hunting, and recreational driving.
MA L (Semi-Primitive Non-Motorized Recreation)	10,162	Emphasis is on providing semi-primitive non-motorized recreation opportunities. Wildlife, range, and fuels management may occur where consistent with this emphasis. Timber harvest and road building are not consistent with this emphasis, and none are scheduled within this planning period. These areas will receive priority in dispersed recreation management, trail and trailhead development, and trail maintenance.

## Desired Conditions

Desired conditions are desired characteristics and conditions expected because of prescribed management. They provide a snapshot of what the resource would look like when goals, objectives, standards, and guidelines are met. Desired conditions can apply to the present or future. As previously discussed, an interdisciplinary team identified the desired resource conditions based on the PNC as described in TES. A description of the PNC, existing conditions, and desired conditions for each TES unit can be found in appendix B.

- Full capacity range sites exhibit the biodiversity necessary for a sustainable ecosystem.
- Maintain or move herbaceous species composition and surface components, such as litter and basal vegetative percentages toward site potential as described in the Santa Fe National Forest Terrestrial Ecosystem Survey.
- Forage species composition should exhibit a suite of species that are appropriate for the site based on the potential natural community as described in the Santa Fe National Forest Terrestrial Ecosystem Survey.
- Reduce the amount of non-native and invasive plant populations within the allotment.

## PUBLIC INVOLVEMENT

This project was initiated in November 19, 2007. Scoping letters were sent to 41 interested parties and adjacent land owners on March 27, 2008 to invite comment on the proposed action. The District did not receive responses to the scoping letter.

On December 19, 2008, The *Proposed Action, Alternatives, and Preliminary Effects Analysis for the Caja del Rio grazing allotment* was made available for the 30 day notice and comment period. The proposed action was mailed to sixteen interested parties and grazing permittees. A legal notice was published in the Albuquerque Journal on December 26, 2008 notifying the public on the start on the comment and notice period. The District received three responses during the formal 30-Day comment period. No new alternatives or significant issues were identified during the 30-day comment period.

Responses to public concerns submitted during the 30-Day comment and notice period can be found in appendix C of this document.

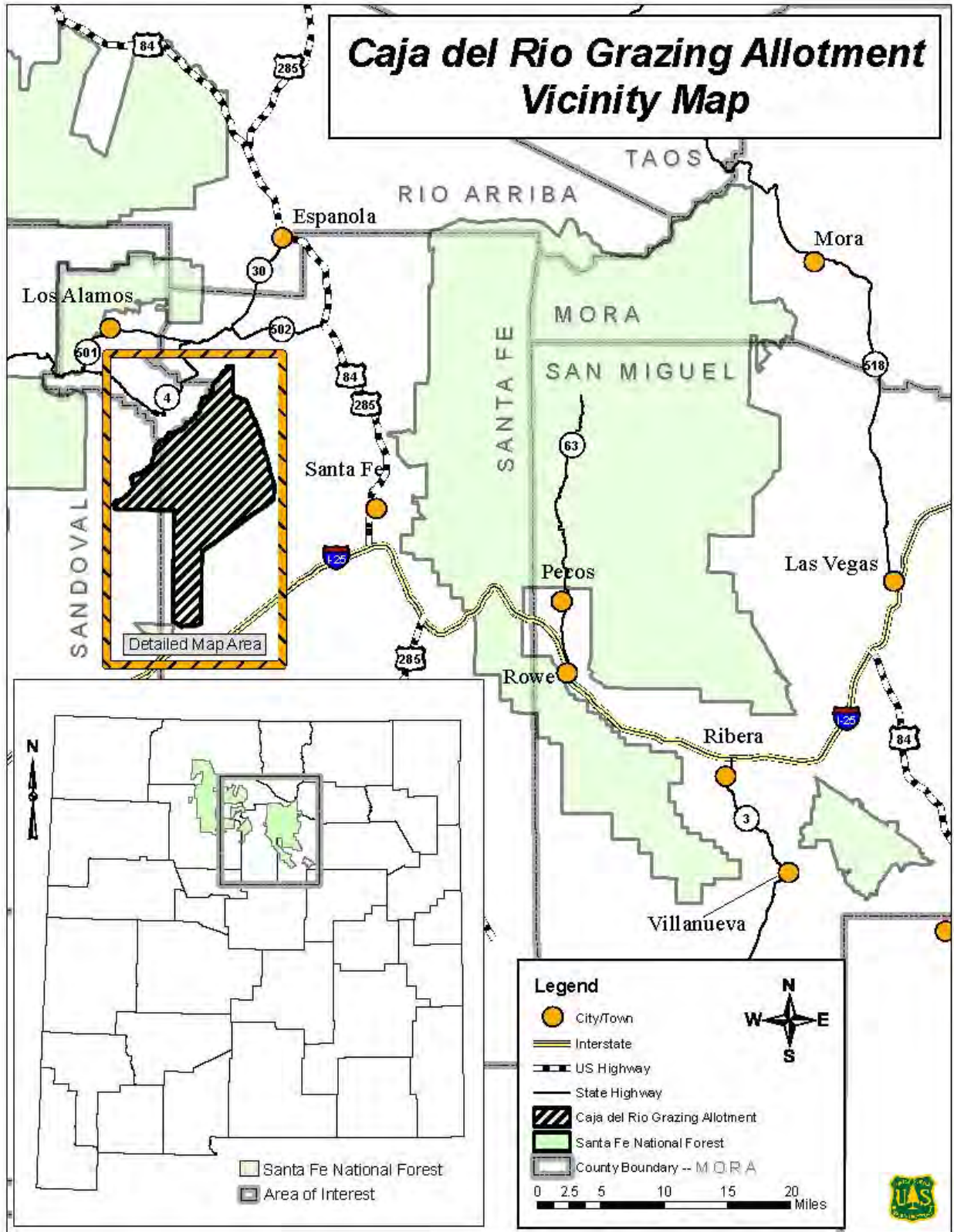
## DECISION FRAMEWORK

The District Ranger of the Española Ranger District is the responsible official for selecting an alternative for the Caja del Rio Grazing Allotment. Based on the environmental analysis, Forest Plan direction, and results of public involvement, the Deciding Official must decide whether to proceed with a specific action. If an action alternative is selected, the decision may include mitigation measures in addition to the Forest Plan Standard and Guidelines. There is a two-part decision to be made for authorizing livestock grazing.

- Whether livestock grazing should be authorized on all, part, or none of the project area.
- If the decision is to authorize some level of livestock grazing, then what management prescriptions will be applied (including standards, guidelines, grazing management, and monitoring) to ensure that desired condition objectives are met or that movement occurs toward those objectives in an acceptable timeframe.

Decisions to permit cattle grazing will be implemented collectively through the issuance of current grazing permits and through the associated allotment management plans (AMP) that will be prepared for each allotment. The AMP will detail the kind and number of livestock, grazing systems, grazing seasons, utilization levels, range facilities, implementation schedule of new range facilities, mitigation measures, and other features specified in the proposed action. Included in the AMP are the monitoring and evaluation criteria needed to measure progress toward meeting desired conditions and what, if any, adaptive management measures will be taken to accomplish objectives. Allotment grazing will be authorized with issuance of new 10-year term grazing permits to allotment permittees.





**Santa Fe National Forest**

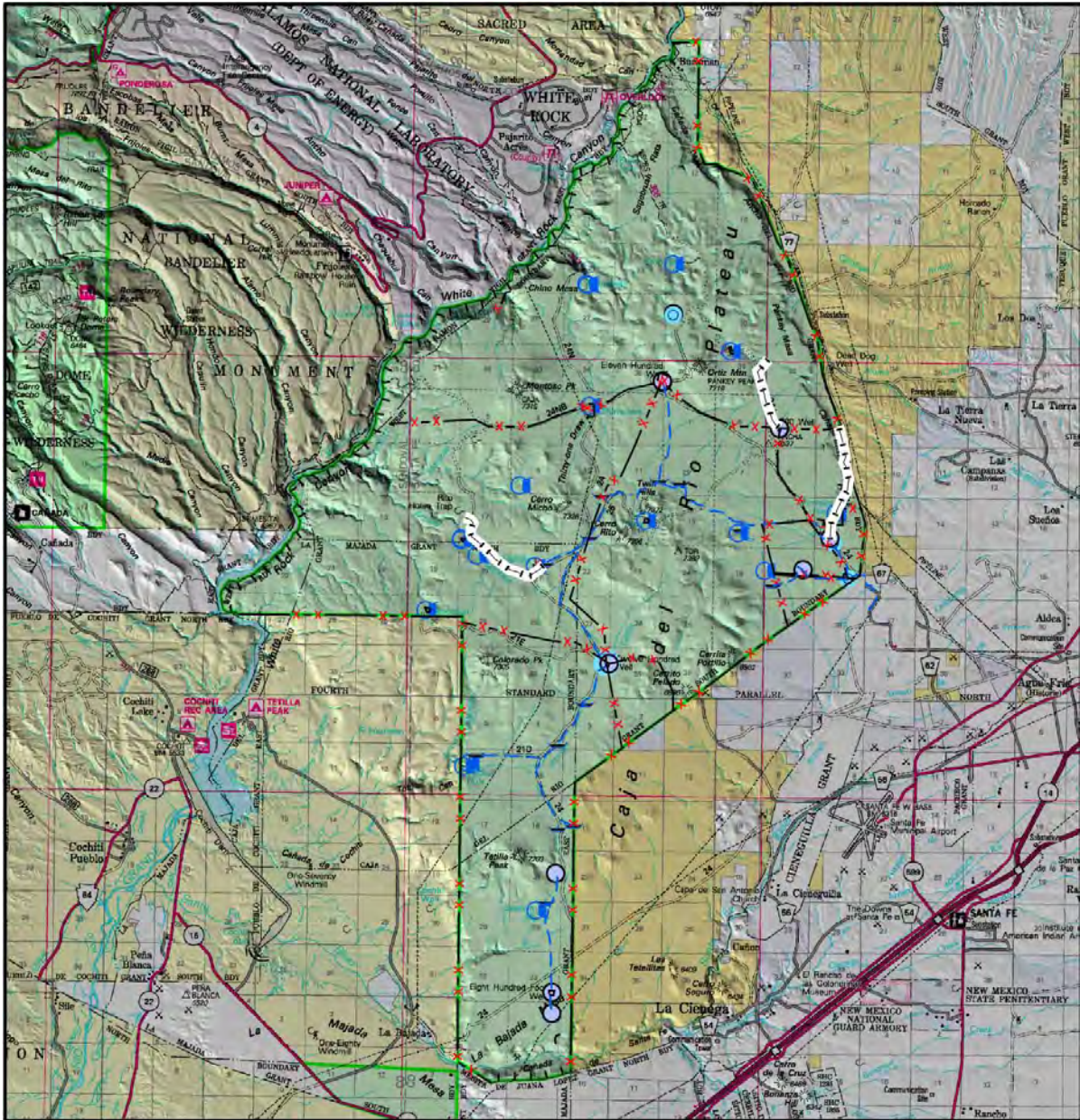


**Caja del Rio Grazing Allotment  
Proposed and Existing Range Facilities**

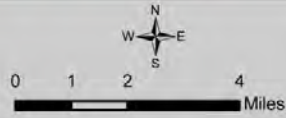
bed 9/5/08

**Legend**

- +— Proposed pipeline
- T— Natural Barrier
- X— Fence
- Pipeline
- Coral
- Earthen Tank
- Trick Tank
- Water Storage Tank
- Water Troughs
- WELL



This product is reproduced from geospatial information prepared by the USDA, Forest Service. Represented features may not be in an accurate geographic location. The Forest Service makes no expressed or implied warranty, including warranty of merchantability and fitness, with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. The Forest Service reserves the right to correct, update, modify, or replace this geospatial information without notification. For more information, contact Santa Fe National Forest (505)438-7840.



## CHAPTER 2 – ALTERNATIVES CONSIDERED

### ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Continuation of current management: The continuation of current livestock management was eliminated from further study since specific existing range facilities, such as pipelines, wells and fences are not functioning properly which is resulting in poor livestock distribution in several areas within the allotment. These range facilities have been identified in the past to be necessary for the management of permitted livestock and are still necessary presently.

### FORMALATION OF ALTERNATIVES

The IDT analyzed both internal comments and comments received from the public during the scoping and 30 day comment and notice period. Analysis of alternatives requires consideration of a range of reasonable alternatives (40 CFR 1505.1). The range of reasonable alternative includes both alternatives that warrant detailed analysis, and alternatives that are considered by eliminated from detailed study. In cases where the design and configuration of the proposed action can mitigate resource concerns to acceptable levels, the proposed action may be the only viable action alternative. When there is a significant issue with the proposed action, an alternative to the proposed action shall be developed and analyzed in detail (FSH 1909.15, sec 14). No significant issues were identified during the scoping or the 30 day comment and notice period for this allotment.

In addition to the proposed action, A “no action” alternative has been developed and analyzed in detail. “No action” is synonymous with “no grazing” and means that livestock grazing would not be authorized within the project area. This “no action” alternative provides point-of-reference for describing the environmental effects of the proposed action.

### DESCRIPTIONS OF ALTERNATIVES CONSIDERED IN DETAIL

The following is a description of alternatives analyzed in detail by the Interdisciplinary Team. After an alternative has been selected and as the project is implemented, actual amounts of activities on the ground (measured in acres or miles) may vary. All changes would be evaluated to ensure that any effects are within the parameters of effects analyzed in this document and would be documented in the project record. Pertinent Forest Plan Standards and Guidelines designed to mitigate affects of alternative treatments are also listed. All acres and mileage listed are approximate. Maps for each alternative can be found at the end of this chapter.

This section provides a detailed description of the proposed action and alternative methods for achieving the project’s purpose and need statement. Alternatives were developed based on issues raised by the IDT, the public and other agencies.

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

No new grazing permits would be issued for the allotment and livestock grazing would not be permitted on the allotment. Range facilities would be evaluated for wildlife, watershed, and soil protection needs. This alternative provides a baseline or reference point against which to describe environmental effects of the action alternatives. This alternative responds to the concerns of those who want no livestock grazing. Options for future management in this area would not be foreclosed.

## Alternative 2 - Proposed Action

The following proposed action has been developed to meet the project’s purpose and need. The proposed action consists of the following components: permitted livestock, range facilities, and adaptive management. The proposed action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decision-making). The proposed action includes the authorization of livestock grazing as a management practice and the required management practices necessary to maintain or achieve desired resource conditions.

The Española Ranger District, Santa Fe National Forest proposes to continue to authorize livestock grazing on the Caja del Rio grazing allotment under the following terms:

**Permitted Livestock:** The number of livestock “permitted to graze” would be authorized up to 492 cow/calf pairs and 28 bulls (8,305 AUMs<sup>1</sup>) from March 1st to February 28<sup>th</sup> (year-long) under twelve - ten year term grazing permits. A utilization guideline of conservative use (40 percent forage utilization as measured at the end of the growing season) would be employed to maintain or improve rangeland vegetation and long term soil productivity. An annual increase in authorized AUMs may be allowed if extensive monitoring shows evidence that there is a favorable climatic condition that provides sufficient forage production to support additional AU’s during the growing season.

**Range Facilities:** In consultation with the grazing permittees, several range facilities have been identified (Refer to Map) that will further enhance livestock management on the allotment. These range facilities are intended to improve livestock distribution and improve upland rangeland conditions. The following new range facilities have been identified for construction:

- 6.2 miles of new pipeline with three new drinkers

**Adaptive Management:** Adaptive management focuses on the results of the short-term and long-term resource monitoring, as opposed to selecting one specific course of action that will not be deviated from over time. Adaptive management allows for adjustments in timing, intensity, frequency and duration of grazing, the grazing management system, and livestock numbers according to resource conditions and allows for the flexibility necessary to meet utilization guidelines and long-term desired conditions.

The exact number of livestock authorized<sup>2</sup> to graze on an annual basis would depend on such things as resource condition of the allotment, available water, annual forage production, condition of structural facilities, and range readiness. Anything less than the full permitted livestock numbers represents a condition in which capable acres and other integral components of the range management, such as livestock waters, are producing less than required to support full permitted livestock numbers. Adjustments to the Annual Operating Instructions (AOI) which specifies the timing, intensity, frequency, and duration of cattle grazing may occur during the grazing year, based on conditions and range inspections by the district range staff and grazing permittees.

---

<sup>1</sup> **Animal Unit** (AU) is considered one mature cow approximately 1000 lbs, either dry or with calf up to 6 months of age, or their equivalent, based on a standardized amount of forage consumed. **Animal Unit Month** (AUM) is a measure of the amount of forage required by a 1000 lb cow or its equivalent for one month based on a daily allowance of 26 lbs. of dry matter (DM) intake per day (Society for Range Management 1998, USFS 1997).

<sup>2</sup> **Permitted** livestock indicates the livestock that are permitted by the Term Grazing Permit. **Authorized** livestock is the number of livestock that are authorized annually and billed for grazing on NFS lands.

Monitoring would determine whether the project-level decision is being implemented as planned (implementation monitoring) and, if so, whether the objectives identified in the Forest Plan, Annual Operating Instructions (AOI) and Allotment Management Plan (AMP) are being achieved in a timely manner (effectiveness monitoring). Allotment monitoring would be open, cooperative, and inclusive process with the permittees. Implementation and effectiveness monitoring are critical to determine when or if adaptive management changes should be made and to guide the direction that those changes take.

If selected, the proposed action will be incorporated into an Allotment Management Plan (AMP), scheduled to take affect during the 2010 livestock grazing season. Grazing permits, and their associated AMP and AOI, will be issued as implementing actions. The decision is expected to remain in effect until new information or changed conditions warrant a new analysis of the allotments. The selected alternative includes numerous design criteria intended to maintain or enhance watershed, riparian habitats and upland vegetation conditions. It also includes short-term and long-term monitoring requirements designed to measure the effectiveness of the actions on achieving or moving toward the desired conditions.

## MITIGATION MEASURES

To mitigate resource impacts, the following measures will be implemented under all 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 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 affects would be expected to occur.

**Soil, Water and Vegetation** – the objective is to mitigate soil, water, and vegetation impacts from cattle grazing and range facility construction through incorporating elements of adaptive management.

- Cattle will not be moved onto an allotment or pasture until range readiness and facility inspections indicate that appropriate conditions exist;
- Key herbaceous riparian vegetation, will have a minimum stubble height of four inches on the stream bank, 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 stream banks, will not be grazed more than 30 percent during the growing season or 40 percent during the dormant season;
- Stream bank instability attributable to grazing livestock will be less than ten percent on a stream segment.
- Upland range resource values will be protected from unacceptable grazing effects as determined through monitoring (see above). Livestock grazing will be managed at a level corresponding to conservative intensity. Minimum acceptable stubble heights have been developed by the Forest Service for certain species (see section 3.5.1 Vegetation – Affected Environment). Residual plant material should not be reduced below those levels. Cattle will be moved when utilization of key forage species in key use areas approaches established standards.
- Salt will be placed to minimize impacts to riparian zones, meadow ecosystems, and other forest resources (USDA-FS 1987, pg 68). Salting locations will vary annually and will not be located within ½ mile of water sources when possible.

**Wildlife** – the objective is to mitigate impacts to wildlife from continued cattle grazing and from disturbance associated with the location and construction of range facilities.

- Allowable use by livestock will be limited to 40 percent and less use in riparian zones or later entry dates. This will be achieved through monitoring forage utilization.
- Northern goshawk: any tank, fence, or corral construction activities within nesting habitat will be conducted outside of breeding season or after Aug 15.
- Peregrine falcon: any tank, fence, or corral construction activities within potential habitat will be conducted within limits placed on disturbance based on distance from nesting areas.
- Construction and maintenance of range facilities will be evaluated and executed to have no adverse effect on threatened and endangered species (USDA-FS 1996, 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 newly recommended mitigation measures have been implemented.
- Drinkers on any water developments will have escape ramps that are contact with the sides and bottom of the drinkers to prevent small wildlife from passing behind them or failing to reach them if the water level drops. Support structures for drinkers will not extend above the rim to prevent flight path interference.
- Allotment fence management will meet wildlife standards that allow easy migration and passage. All fences should be built to wildlife specifications (USDA-FS 1996, pg 66 and 67):
  - height – 40-42 inches,
  - spacing between top wire and second wire equals at least 12 inches,
  - bottom wire should be 16 inches from the ground,
  - all new fence sections should be marked with flagging to alert wildlife of new barrier, and
  - fences and loose wires will be removed as they are abandoned.
- Non-game entrance and escape ramps will be provided on water developments intended for livestock and wildlife use (USDA-FS 1996, pg 66). New and reconstructed livestock water developments will include wildlife access, cover, and escape considerations (USDA-FS 1996, pg 67).
- Cattleguards should be designed to prevent small animal entrapment.

**Heritage Resources** – the objective is to protect heritage resources (archaeological sites) from direct or indirect impacts caused by cattle congregation on sites with known impacts and ground disturbing activities associated with the construction of range facilities.

- Range structures will be located to avoid concentrations of livestock on identified heritage resource sites. No ground disturbing activities will be conducted within known site boundaries.
- No salting will occur within or immediately adjacent to site boundaries.
- Scattering slash over trailing areas, eroding areas, bedding down areas and areas being affected by trampling and/or construction slash barriers and/or slash fences to redirect cattle around sites when accessing water sources and/or covering sites with sufficient slash to prevent cattle from entering the sites' boundary.

- If any unrecorded sites are discovered during the course of project implementation, all project activities in the vicinity of the site(s) will cease and the District or Forest Archaeologist will be notified.
- The Forest will conduct monitoring in the area as part of this project to determine the extent of grazing impacts on heritage resources. At a minimum, monitoring will occur halfway through the life of permit reissuance and just prior to reissuance in the future.
- Any additional range improvements not covered by this report will require additional heritage resource survey and/or clearance prior to construction.

## MONITORING

The objective of monitoring is to evaluate the abilities of all parties involved in planning and implementing the grazing program.

**Implementation monitoring** will include periodic inspections to ensure compliance with permit terms and conditions such as salting locations, seasonal restrictions, utilization, and any mitigation measures that are approved in the project decision. Stock checks will also be conducted to assure that only permitted livestock enter the allotment, the allotment is occupied only within the permitted times, and use occurs only within the approved areas within each allotment.

**Effectiveness monitoring** will determine if grazing standards and guidelines, grazing prescriptions, and Allotment Management Plan practices are effective in accomplishing the planned objects. Effectiveness monitoring is essential for determining the annual amount of authorized AUMs according to an adaptive management framework where each permit includes a range of authorized AUMs.

**Range readiness** will be monitored before permitted livestock enter the allotment at the beginning of the season to assess whether the soil is too wet and that sufficient forage growth has occurred.

**Utilization monitoring** measures forage utilization, riparian vegetation impacts, and condition of stream banks at the end of the season to assess whether standards and guidelines set in the Forest Plan are attained. Stubble heights of forage species may be measured during the grazing season for these same purposes. Stubble height measurements usually occur in the middle and end of the grazing season, unless resource conditions require more regular monitoring. These measurements will occur in key areas.

A key area is a portion of range which, because of its location, grazing or browsing value, and/or use, serves as an indicative sample of range conditions, trend, or degree of seasonal use. It guides the general management of the entire area of which it is part. Key area locations are evaluated annually during development of the Annual Operating Instructions. Changes in management actions (installation or removal of range facilities, season of use, number of animals, etc) can alter grazing patterns within a pasture and the degree to which a previously selected key area is representative of the current years planned use. Likewise, non-grazing management related changes in land use might also affect grazing patterns.

If deemed necessary, key area locations may be modified. Reconsideration of key area locations identified by the Forest Service and the permittees will adhere to the following guidelines:

- They are between 0.25 and 1.00 mile from livestock water sources, on slopes less than 15 percent, on satisfactory or impaired soils, and are greater than five acres in size.

- The key area must provide an indicative sample of range conditions, trend or degree of seasonal use. Potential key areas are not low production sites (< 100 pounds/acre), within 100-yards of roads or fences, nor on land controlled by another entity.



## CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

### INTRODUCTION

This chapter summarizes the physical and biological, social and economic environments of the affected project area and the cause and effect relationship of implementing each alternative on that environment. It also presents the scientific and analytical basis for comparison of alternatives presented in the previous charts. Resource specialists analyze the magnitude of direct, indirect, and cumulative effects of the proposed activities on both short and long-term productivity. Only information necessary to understand the environmental consequences is included in this document. The project record contains all project-specific information, including specialist reports and results of the public participation. The project record is located at the Supervisor's Office. Information from the record is available upon request.

The following are definitions of terms used in discussing the environmental effects of proposed activities.

**Affected environment** (40 CFR 1502.15) is a brief description of the area(s) to be affected by the proposed activities. The description shall be no longer than is necessary to understand the effects of the alternatives.

**Direct effects** (40 CFR 1508.8) are those occurring at the same time and place as the triggering action (e.g. Current authorized livestock grazing on riparian areas). **Indirect effects** (40 CFR 1508.8) are those caused by the action, but occur later, or at a distance from the triggering action (e.g. Sediment input into streams due to a loss of vegetative cover from grazing activities). **Cumulative effects** (40 CFR 1508.7) are the effects on the environment that results from incremental effect of the action added to the effects of other past, present, and reasonably foreseeable future actions, regardless of whether or not the agency or person undertakes them and regardless of land ownership on which other actions occur. An individual action when considered alone may not have a significant effect, but when its effects are considered in addition to effects of other past, present, and reasonably foreseeable future actions, the effects may be significant (e.g. The effects of catastrophic wildfire on a grazing allotment and the watershed as a whole).

The cumulative effects analysis for each alternative is evaluated separately for each resource and may have different spatial and temporal boundaries. Agencies are not required to list or analyze the effects of individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined. The analysis of cumulative effects begins with consideration of the direct and indirect effects on the environment that are expected or likely to result from the alternative proposals for agency action. Agencies then look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives.

The USDA-Forest Service uses the best available science and most reliable and timely data available. Accuracy from the Geographical Information Systems (GIS), Natural Resource Information System (NRIS), Forest Inventory, and Analysis Database (FACTS), Infrastructures Database (INFRA) and other databases vary in accuracy. All attempts to verify and update this information have been made where possible.

### BACKGROUND

Herbivory (grazing) is an influential and nearly universal process that is simply defined as the consumption of forage by herbivores (Valentine 2001). Herbivores are comprised of wild ungulates (hoofed animals, including

ruminants, but also horses, elk and deer), domestic livestock, some small mammals, and insects. Some Herbivores are considered generalist, such as domestic livestock, graze a wide variety of plants, while others are considered specialist, such as deer and antelope, and are specific in what they consume.

Grazing has a variety of direct and indirect effects to plant communities in the southwest. Depending on the intensity, grazing affects species composition, species abundance, primary production, physical properties of soils, and other belowground attributes. The effects of livestock grazing can be positive or negative depending on duration, extent, and magnitude. The impact of grazing to southwestern ecosystems has a long history, which has a bearing on the existing conditions of New Mexico's grassland communities.

Native herbivores in New Mexico consisted on deer, antelope, elk, and bison. Most of the grassland communities in New Mexico were not subject to a long-evolutionary history of grazing. Elk populations were limited in only a few mountain ranges, and only comprised half of today's range. Large bison herd were historically documented only occupying the Great Plains region of the state. Very little evidence suggests that bison occupied the areas west of the Rio Grande Valley or the mountain ranges (Milchunas 2006).

The Spanish were the first Europeans to graze domesticated livestock in New Mexico beginning in the late 1500's. During both the Spanish Colonial and Mexican periods (1598 to 1846), ranching and farming activities occurred primarily in and around land grants and Puebloan settlements. Livestock grazing was moderate and was practiced more for subsistence rather than extensive economic markets. Sheep were grazed more extensively than cattle or horses in the early years. In the 1800s, the amount of sheep production increased as Spanish populations moved eastward into the plains around present-day Las Vegas, across the Sandia and Manzano Mountains and westward for the Rio Grande Valley.

Localized areas of over use of forage resources increased during the early 1800's as commercial sheep production increased. However, the majority of domestic sheep production was relatively small in scale and subsistence-oriented during this period. As an example, Pajarito Plateau west of Santa Fe was utilized for domestic grazing by local Hispanic and Pueblo residents as common property, bringing their small herds to the plateau for summer grazing. They also harvested from the abundant timber resources for personal use and small-scale business ventures and planted some summer crops. The small size and noncommercial nature of these operations ensured that sufficient grass and forest resources remained for all who needed them. Although concentration of sheep and cattle near settlements created areas of overuse during colonial times, herds were generally small and there were vast amounts of rangelands that were not significantly grazed by sheep and cattle. In northern New Mexico, loss of land grant lands limits the grazing areas open to small, local communities, many of which are surrounded by National Forest (Raish 2004, Raish & McSweeney 2003). The Caja del Rio Plateau shares a similar history to the adjacent Pajarito Plateau.

Large-scale commercial livestock ranching began in the mid 1800's and lasted until the turn of the century. Exceedingly large numbers of both sheep and cattle were grazed on rangelands in attempts to achieve maximum economic gain. At its peak in the late 1890's and estimated 9 million animal units were grazed in New Mexico. The native grasslands could not sustain these large numbers of animals and cattle populations crashed after severe drought in the summer of 1891 and 1892. The combination of drought and overgrazing led to soil cover loss from wind and water erosion. Fire suppression activities which began at the turn of the century in combination with reduced herbaceous plant cover due to overgrazing resulted in increases in woody shrubs and plants with low grazing preference across the landscape (Raish 2004)

The Forest Service began the surveying NFS lands and adjudicating individual permits to conform to range capacity in 1910. Throughout the early part of the 20th century, the Forest Service began address degraded

rangelands through grazing improvement programs and grazing permit reductions. Beginning in the 1920s and continuing throughout the 1960s, there was a continuously decline in the number of permitted numbers of livestock (Raish and McSweeney, 2003).

The Caja del Rio and La Majada Allotments were formed out of Caja del Rio Land Grant purchased by the Federal Government in 1935 under the "Land Program" of the Federal Emergency Relief Administration (F.E.R.A.). A cooperative agreement in 1939 between the Indian Services, Resettlement Administration, and the Soil conservation Service, administration of the grants was assumed by the Soil Conservation Service. Range surveys, maps, and a range management plan were made by the SCS range examiners between 1936 and 1939. In 1941 the livestock permittees on the land grants (actually one administrative unit) formed the Caja del Rio - Majada Cooperative Association. In 1941 most of the existing allotment improvements were repaired or reconstructed, including the old wells built prior to 1935. The Forest Service assumed administration responsibilities of the allotment in 1953. Average actual use from 1954 to 1972 was 711 permitted cattle

## GRAZING MANAGEMENT

The Caja del Rio grazing allotment is a yearlong use community allotment, in which twelve permittees graze 492 head of cow calf pairs and 28 bulls which equates to 8,305 animal unit months. Use of the allotment is by a nine pasture deferred rotation system. The completion of the Caja del Rio Pipeline in 2006 has provided consistent reliable water to these pastures.

**Table 1 - Allotment Use and Facilities**

Allotment Acres	67,197
Number of Permits	12
Season of Use	Yearlong 3/1 to 2/28
Number of Cattle	520
Animal Use Months (AUM)	8,305
Number of pastures	10
Grazing System	deferred rotation
<u>Range Facilities</u>	
Earth Tanks (each)	18
Wells (each)	7
Pipelines (miles)	31
Drinking Troughs (each)	14
Storage Tanks (each)	10
Fences (miles)	77

Within the last five years stocking levels on the allotment has been variable. Much of this variability can be attributed by drought conditions experienced the last several years. On the average from 2000 to 2006 precipitation has been 23 percent below normal from the 30 year average (NRCS Snowtel 2007). In 2002 precipitation was 53 percent below the 30 year average. The Santa Fe National Forest at this time, implemented significant reductions in permitted use requiring permittees to remove livestock from these allotments. In 2003 because of continued drought conditions, the Caja del Rio permittees voluntarily removed all their livestock from the allotment on October 11th of that year. Since 2003 stocking levels have remained conservative (Table 2).

Annual utilization monitoring is conducted on allotment key areas and key species have been identified on the allotment and have been included in the AOI for several years. Key forage species for the Caja del Rio grazing

allotment are blue grama, western wheatgrass, and crested wheatgrass. Grazing intensity guidelines developed by Holecheck and Galt (2000) for shortgrass-piñon-juniper rangelands that are currently followed are described in the following table.

**Table 2 - Grazing intensity guidelines**

Qualitative Grazing Intensity Category	Use of Forage by Weight (%)	Stubble Height Indicators of Grazing Intensity		
		Blue Grama	Galleta	Western Wheatgrass
		Average height of vegetation (inches)		
Conservative	31-40	1.5	2.5	4.0

Reductions in permitted use occurred in many areas of the Carson and Santa Fe National Forests and prompted the development of the “Rangeland Management Action Plan, Santa Fe, and Carson National Forest(s). This plan outlined a strategy to define actions regarding livestock use because of present and predicted drought conditions. In addition, the document outlines early and effective communication with livestock operators to communicate drought issues to allow effective planning.

**Table 3 - Caja del Rio grazing allotment Authorize and Actual Livestock Use**

Year	Authorized Use	Actual Use (# of Livestock)	% Actual Use of Permitted
2003	239	97	46%
2004	98	45	15%
2005	137	84	26%
2006	175	84	32%
2007	292	84	52%

## SOILS & WATERSHED

### AFFECTED ENVIRONMENT

#### SOILS

**Landscape and Geology:** The Caja del Rio grazing allotment is situated southwest of the Sangre de Cristo Mountains and the municipality of Santa Fe, on a high-elevation plateau geographically separate from other portions of the Santa Fe National Forest. Elevations range from just over 5,400 feet along the Rio Grande to 7,326 at Cerro Micho and 7,203 feet at Tetilla Peak, an isolated cinder cone visible from Santa Fe. Allotment soils are derived from Tertiary volcanic basalt flows and cinder cone eruptions. They are calcic-alkaline, and have limited development with shallow horizons. The allotment has a southerly aspect within an elevated plateau ecosystem of plains, hills, shallow basins, and volcanic basalt escarpment. The terrain is flat-to-rolling, except for high points at the cinder cones. Much of the soil is stony or cindery loam.

The Caja del Rio mesa receives ten-to-twelve inches of precipitation per year (Western Regional Climate Center, 2008) with some winter snow, but the most dominant moisture regime is associated with the summer thunderstorms (Terrestrial Ecosystem Survey, Santa Fe National Forest 1993). Ephemeral swales and some intermittent stream channels dissect the allotment. Two rivers border the allotment, the Rio Grande along the west boundary and the Santa Fe River channel flows at the south end. True riparian vegetation is found only along portions of these rivers.

**Soil Condition:** Soil condition is primarily determined by evaluating surface soil properties. The soil surface is the critical area where organic matter accumulates, decomposes, and eventually become incorporated into soil.

It is also the zone of maximum biological activity and nutrient release. The physical condition of this zone plays a significant role in soil stability, nutrient cycling, water infiltration and energy flows. The presence and distribution of the surface soil is critically important to productivity. The rating procedure evaluates soil quality based on an interpretation of factors that affect three primary soil functions. The primary soil functions evaluated are soil stability, soil hydrology, and nutrient cycling which are all interrelated. The soils hydrologic functions are the soils ability to store, and transmit water. Soil stability is the soils ability to resist erosion. Nutrient cycling is the ability of the soil to accept, hold and release nutrients (FSH 25 09 R3 SUPPLEMENT).

The soils in the Caja del Rio grazing allotment were mapped almost entirely as unsatisfactory, having a reduced ability for hydrologic and nutrient function. Stability is not the issue. Unsatisfactory condition occurs here due to the geologic parent material, which is basalt. Only modest soil horizon development has occurred, although local pockets of more productive soil support improved forage.

### RIPARIAN, WETLANDS, STREAMS, WATER QUALITY

This allotment is located within the headwaters of two Fifth Code Watersheds: Canada Ancha-Rio Grande and Santa Fe River. The following table lists the 6<sup>th</sup> code watersheds that portions of the grazing allotment fall within.

**Table 4 - 6th Code Watersheds within the Caja del Rio grazing allotment**

HUC Name	USGS Code No.	Drains to	Allotment Acres in HUCs
Canada Ancha-Rio Grande	130202010203	Rio Grande	4,199
Water Canyon-Rio Grande	130202010204	Rio Grande	11,286
Alamo Canyon-Rio Grande	130202010205	Rio Grande	11,142
Outlet Canada Ancha	130202010202	Rio Grande	5,120
Capulin Canyon-Rio Grande	130202010207	Rio Grande	4,248
Headwaters Canada Ancha	130202010201	Rio Grande	9,279
Arroyo Calabasas	130202010101	Santa Fe River	5,964
Canada Cachili	130202010208	Rio Grande	8,023
Canada Cachili-Rio Grande	130202010209	Rio Grande	648
Outlet Santa Fe River	13020201020	Santa Fe River	6,962
Total acres	395,621		66,873

In this geographic area, the Canada Ancha unit is delineated in the “butterfly” mode, where drainage from topographic highs on the east and to the west both contributes flow to the Rio Grande. Only two of the 6th-code units of the allotment drain to the Santa Fe River. Overall, allotment lands cover 17 percent of the combined total area.

**Streams, Floodplains, Riparian and Wetlands:** Intermittent stream channels and ephemeral swales cross this allotment. Named intermittent channels include Thirty-One draw, Arroyo Eighteen, and Arroyo Tetilla. The only perennial water includes the Rio Grande, which flows adjacent to the allotment along the northwest boundary for 8 miles, and the Santa Fe River, which flows east-to-west for 2.5 miles off the southern boundary of the allotment. Riparian vegetation is identified only where these rivers flow, at the base of 1,000-foot and 400-foot escarpments, respectively. The Rio Grande floodplain itself hosts a productive overstory of native and non-native grasses, shrubs and trees. Cattle can approach the river at the north end of the allotment at the mouth of Canada Ancha, near the Buckman townsite and the Santa Fe River at the south end of the allotment. No wetlands are found.

Flow data for the Rio Grande and the Santa Fe River and other flow information can be found at the United States Geological Survey National Water Information System Website <http://waterdata.usgs.gov/nwis>.

**Water Quality:** Water quality has been assessed within the analysis area and both these reaches of the Rio Grande and the Santa Fe River have been determined to be impaired. According to the 2008-2010 NMED SWQB report “Status of Water Quality in New Mexico: The Integrated 305(b) Assessment and 303(d) Listings Report” (NMED, 2008), both rivers are listed as supporting all designated beneficial uses except for “Marginal Coldwater Aquatic Life.”

Probable causes for impairment in the Rio Grande include turbidity and PCB contamination, neither of which is attributed to livestock use. Probable causes for impairment in the Santa Fe River include biological indicators, low dissolved oxygen and sedimentation/siltation. The majority of water in the section of the Santa Fe River which flows through the allotment originates from the City of Santa Fe Municipal Waste Water Treatment facility. One of the sources indicated includes rangeland grazing.

## **DIRECT AND INDIRECT EFFECTS ON SOILS AND WATERSHED**

**General Effects to Soil and Watersheds:** Impact to soils and watershed (rangeland hydrology) vary from allotment to allotment depending on livestock management, vegetative types, precipitation levels and other climatic and geological factors. The general direct impacts from livestock grazing include: reduction in vegetative cover and trampling. Depending on the intensity and timing of livestock grazing, increases in overland water flow; reductions in soil water content; increase in erosion; and decreases in infiltration rates may occur (Gifford and Hawkins 1979). Livestock grazing on public lands can also be a source of non-point pollution. Sedimentation can be an impact from grazing activities, and sometimes elevated bacterial coliform levels are a concern. This is not just isolated to the lands being grazed, but may extend to areas downstream outside of the grazing allotments.

Livestock grazing can also be beneficial to watersheds if managed at a conservative to moderate level. The key to maintaining health hydrological conditions on rangelands is through practices that develop and maintain good plant cover. Perennial grassland communities have high basal areas and excellent soil binding properties and play a critical role in watershed stability (Holechek et al. 1989).

In order to evaluate extent of change due to the proposed action, certain resource variables can be measured and modeled. For example, erosion can be estimated as soil loss in tons per acre. Thus, in this allotment, soil map units were selected from the more likely areas of cattle concentration for each alternative.

The key factors most likely to affect soil loss on allotments are grazing intensity and frequency. Utilization levels provide the best level of intensity. Grazing intensity is more directly associated with ungulate distribution patterns than overall stocking numbers.

Data from these sources were compared to standards in the Santa Fe National Forest Land and Resource Management Plan (1987). Watershed condition was analyzed strictly on the basis of the effects from grazing, relative to existing base conditions, and regardless of outside variables. Modeled soil loss was compared to the TEU soil loss tolerance levels in tons per acre. (Tolerance levels were set by Forest Service soil scientists during forest-wide mapping in the 1970’s and 1980’s. One ton of soil loss is approximately equal in weight to a uniform depth of 0.007 inches of soil over one acre).

It should be noted that any model-predicted runoff or erosion value by any model, will be within only plus or minus 50 percent of the true values. Erosion rates are highly variable, and most models can only predict a single

value. Replicated research has shown that observed values vary widely for identical plots, or the same plot from year to year (Elliott et al, 1994, 1995).

Water quality is assessed by comparing existing conditions with desired conditions that are set by the States under the authority of the Clean Water Act (CWA, Sections, 303(d), and 305(b)). As delegated by the U.S. Environmental Protection Agency (EPA), the New Mexico Environment Department, and Surface Water Quality Bureau (NMED SWQB) is the regulating authority for water quality in New Mexico under the 2006-2008 impairment List. The general classifications used for surface water quality are “attaining” or “impaired” for all uses specified, and those not yet assessed. For impaired streams, the SWQB calculates allowable pollutant load (Total Maximum Daily Load, TMDL) based on certain formulas.

**Alternative 1 – No Grazing:** On the Caja del Rio grazing allotment, up to 492 cow/calf pairs and 28 bulls are allocated under an 8-pasture deferred rotation grazing system. Most acres have potential to be used. Eighty-five percent of the soil is in unsatisfactory condition and twelve percent of the soil is unsuited to grazing. This alternative would result in a continuation of current condition and trend upon the land. Gradual recovery would continue to support increased abundance of vegetation and litter. Unsatisfactory soils would be limited in their ability to change to satisfactory condition, because improvement in soil condition class is a long-term process. This would take several decades or longer, due to the constraints of the geologic parent material these soils are formed. However, ground cover would continue to improve in response to recent changes in water availability and cattle distribution.

In general, cattle use in this allotment is particularly controlled by water development since there are no live streams with the exception of the segments of the Rio Grande River and Santa Fe River, which bounds the allotment to the west and south, respectively. While they continue to be watered at over 30 earthen tanks and numerous drinkers, several deep wells are currently not functioning but will serve as backup water in the event that the City of Santa Fe effluent water is no longer available. Since 2003, water is now pumped to the mesa top through 27 miles of pipeline from a point below the Santa Fe River wastewater treatment plant, via agreement with the city of Santa Fe. This water is distributed to 29 drinkers and six storage tanks.

**Alternative 2 – Proposed Action:** Permitted livestock numbers would be authorized up to 520 head of livestock under a deferred rotational grazing system, although the exact number of AUM’s that can be supported would be determined on an annual basis, according to ecological conditions, available water, condition of facilities, etc. In addition, it is proposed to add 6.2 miles of new pipeline and three new drinkers to continue to improve cattle distribution. No adverse impacts would occur with construction of the proposed pipeline.

Approximately 55 percent of the allotment is considered full capacity range. In order to evaluate extent of change due to the proposed action, certain resource variables can be measured and modeled. For example, erosion can be estimated as soil loss in tons per acre. Thus, in the Caja del Rio grazing allotment, soil map units were selected from a representative area of cattle utilization. The unsatisfactory soils have less inherent hydrologic function, in other words, nutrient availability and water storage capacity are limited. Thus they are prone to annual erosion as follows:

**Table 5 - Predicted Soil Loss and Sedimentation due to Livestock Grazing**

TEU Map Unit(s)	TEU Soil Loss Tolerance tons/ac	WEPP Predicted Soil Loss (Erosion) t/ac	WEPP Predicted Sedimentation
506/501	3.4/3.4	0.16	0.15

As discussed, input variables to the WEPP model include type and amount of vegetative cover, slope, (determined from topographic map quads, TEU unit descriptions and GIS), soil characteristics, and 50-year storm precipitation determined from a random number generator based on real climate data within the model).

Soils that are listed as unproductive were classified due to their inherent geologic potential. Cattle use is likely where the unsatisfactory soils occur, but they are well distributed due to the numerous stockwater developments. The addition of pipe and three more drinkers would improve distribution and increase capacity.

Unsuitable soils on the slopes of cinder cones are not likely to be used by livestock. Meanwhile, the vegetative community composition and percent cover in areas accessible to grazing are slowly recovering from the long-term historic use, according to field inspection and DOQ files. On this allotment, the direction of change caused by livestock grazing is stable except near roads. Soil loss due to cattle utilization is estimated to be below the tolerance levels for erosion and sedimentation, although those soils have inherent erosivity. Ground slope is modest across the majority of the allotment, and this helps soil retention and supports productivity. There is gullying in local areas, but this is mainly associated with old roads, road drainage and other types of disturbance including vehicular access and cinder mining.

Although the NMED 303(d)/305(b) report lists rangeland grazing as a contributor to impairment in the Santa Fe River, the area receives minimal livestock use primarily due to the availability of upland water.

A stable and slow upward trend would occur. With the current permitted numbers and adaptive management (control of timing, duration and frequency) based on monitoring of resource conditions, it is expected that range condition would continue this trend over the next ten years.

It is important to note that the actual soil condition class is not expected to change due to livestock use within the ten-year analysis period, because improved change in soil condition class is a long-term process with many influences. The length of time that changes are anticipated to last is as long as cattle are permitted to graze.

Cattle use is regulated through herding, water availability, and salt placement. Best Management Practices for cattle grazing limit turbidity in the surface water by limiting their access. As discussed above, this may occur by controlling timing or by distribution. In the Caja del Rio grazing allotment, distribution has improved since 2003, with the improved availability of water developments. Under the proposed action turbidity from erosion or sedimentation specifically due to livestock grazing has not been identified. Their access to perennial water is restricted by topography and fencing, with the exception that they may access the Rio Grande at the mouth of Canada Ancha

## **CUMULATIVE EFFECTS ON SOILS AND WATERSHED**

The cumulative effects analysis area discussed in this document includes portions of the two 5th code hydrologic units, Canada Ancha-Rio Grande and Santa Fe River. The watershed boundary divides the allotment into two. Effects could occur from the divide between the watersheds to each river, to the Rio Grande and to the Santa Fe River, respectively. This geography defines the path where soil and sediment are most likely to move. The Santa Fe River drainage is a 5th-code municipal watershed. However, as discussed, management activities within the Caja del Rio grazing allotment only extend to the escarpment above the river. There is no direct, indirect, or cumulative effect to the upstream municipality or the headwaters of the municipal drainage on the forest.

Cumulative effects from alternative 1, no grazing, are expected to be the same as those identified for alternative 2, except as noted, below.

Alternative 2 (proposed action) permits up to 520 AU's (8,305 animal unit months) under year-long rotational grazing in nine pastures. All permitted livestock grazing, wildfire, prescribed fire, timber harvest, roads and other ground-disturbing activities conducted in the past and the next ten years are the relevant federal actions that have a cause and effect relationship with the direct and indirect effects of permitting livestock use in these allotments.

Fifty-five percent of the combined allotment acreage is considered full capacity; the rest is rated as "no capacity" due to steep slopes, rocky exposure, and water availability. However no-capacity areas are regularly utilized during the winter months when cattle seek warm south facing slopes. Monitoring on these allotments indicates a modest upward trend to vegetation utilization in the last several decades. Conservative use by livestock was documented between 2004 and 2007.

The cumulative effects area contains adjacent BLM grazing allotments Calabasas, Caja, Tetillas (BLM 2008). Up to 11,541 AUMs (846 head of cattle and 2 horses) can be grazed within the cumulative effects area including the Caja del Rio grazing allotment. Grazing all allotments can occur year round. Monitoring on the Caja del Rio grazing allotments and adjacent BLM allotments indicates conservative to moderate use. No adverse impacts to riparian, upland rangelands or to the watershed have been identified from permitted livestock grazing.

A 60 to 75-head wild horse herd cumulatively impacts soil and vegetation on this allotment. Although they technically share the entire acreage with cattle, monitoring shows them to frequent the northeast Tetilla and Twelve Hundred pastures. Compaction occurs from both types of stock near water developments, yet the improved water distribution lessens site-specific utilization in the rest of the allotment. The proposed action is planned to continue this trend, including discouraging stock access to the Rio Grande at Canada Ancha. This is the proposal that distinguishes cumulative impacts of the proposed action from the continuation of current grazing management. Alleged impacts to water quality are thus addressed through this Best Management Practice.

There is no recent recorded wildfire within the Caja allotment. Recent (2002-2003) forest fuels treatments include 2,189 acres of the piñón-juniper overstory thinning and mastication, opening areas for improved forage and for erosion control. No other fuels treatments are currently planned in this allotment.

There are approximately 927 miles of unimproved roads in this allotment. Most soil-loss concerns are associated with poor drainage on and from these roads.

In conclusion, the activities proposed in this project would not incrementally add to the effects of past, present and foreseeable activities. Adherence to Forest Plan standards and guidelines, best management practices and mitigation measures will minimize detrimental effects to long term soil productivity or water quality on these allotments.

## **AIR QUALITY**

### **AFFECTED ENVIRONMENT**

Ambient air quality is regulated according to the Clean Air Act, Section 163; which requires Prevention of Significant Deterioration (PSD) according to the class of the air quality management area. The Caja del Rio grazing allotment is within a Class II air quality management area that is in attainment of all air quality requirements.

## DIRECT AND INDIRECT EFFECTS ON QUALITY

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.

## VEGETATION

### AFFECTED ENVIRONMENT

The allotment is located in the Sacramento-Monzano Mountains Section of the Arizona-New Mexico Mountains Semidesert-Open Woodland-Coniferous Forest-Alpine Meadow Province of the Arizona-New Mexico Mountains Ecoregion. The landscape consists of moderate-elevated mountains, hills, plains, and scarps. Rocks consist primarily of basalt flows from the Jemez Mountain Range. Vegetation consists of piñon-juniper and southwestern shrub-steppe cover types. Annual precipitation averages around 10 inches (McNabb et al 2007). Vegetative community types within the allotment consist largely of piñon/juniper overstory with short grass understory dominated by blue grama (65 percent) followed by open grasslands (35 percent) comprised of blue grama, galleta grass, stipa, rabbitbrush and big sagebrush. There is however a portion of the Caja primarily within the sagebrush flats area, where big sagebrush is a major component of the vegetation type. About 29 percent of the allotment is on slopes that are 30 percent or more in gradient. These high gradient slopes are mostly not capable of supporting livestock grazing.

Approximately 55 percent of the allotment is considered full capacity range. Full capacity range is a land area able to support livestock grazing on a sustainable yield basis (i.e. maintaining soil stability and productivity of plant cover). The rest of the allotment has no capacity to support livestock grazing due to physical constraints such as steep slope or in naturally unproductive however steeper slopes receive use during the winter months when cattle seek warm south facing slopes. No grazing capacity is assigned to these areas.

**Table 6 - Caja del Rio Forage Capacity Estimates**

Pasture	Acres	Fully Capable Acres	Non Capable Acres	Total Forage High (lbs)	Total Forage Low (lbs)	Available Forage High (lbs)	Available Forage Low (lbs)
700 Lot Pasture	0.98	0.98	0	465	279	186	112
Bull Pasture	1431.51	1,274	157.1	736,833	442,100	286,878	172,127
FS Admin 1 Pasture	836.21	836	0	406,410	243,846	160,267	96,160
FS Admin 2 Pasture	513.18	513	0	249,898	149,939	150,789	90,473
Headquarters Pasture	438.8	439	0	236,705	142,023	94,681	56,809
Rito Pasture	16,122	6,107	10,015	4,091,138	2,454,683	630,662	378,397
Sagebrush Pasture	21,757	7,538	14,219	6,194,680	3,716,808	1,301,814	781,088
Tetilla Pasture	13,391	9,366	4,025	7,306,500	4,383,900	2,605,377	1,563,226
Twelve Hundred Pasture	1,007	698	309	400,142	240,085	133,679	80,207
Twin Hills Pasture	11,375	7,554	3,821	4,015,122	2,409,073	1,278,607	767,164
Allotment Totals	66,873	34,327	32,547	23,637,893	141,82,736	6,642,940	3,985,764

Range inventories and production-utilization studies were conducted in 1957, 1968 and 1975. The range analysis conducted in 1957 indicated that the majority of the allotment was in poor to fair condition with a downward to static trend. Production – utilization studies conducted in several pasture in the early 1970

indicated areas of heavy utilization and other area of light use. Livestock water distribution was identified as a management concern.

The most recent allotment analysis on file for the Caja del Rio grazing allotment is from 1977. The study concluded that a majority of the allotment's range condition is poor range condition with a downward trend. The 1977 study identified actual use at 711 cattle from 1954 to 1972. In contrast actual use the last five years has been 79 cattle.

Utilization monitoring conducted between 2004 and 2007 showed conservative use levels (<40percent of annual production) across the most of the allotment. This monitoring also indicated some localized overuse within areas associated with livestock watering facilities. This overuse was exacerbated by a lack of proper livestock water distribution throughout the pasture or the duration of livestock in these areas is too long. In 2003, a 25 mile pipeline was installed within the allotment utilizing effluent water from the City of Santa Fe. As a result, livestock distribution improved which reduced the amount of use around historically heavily used areas. The pipeline was constructed under a watershed improvement grant from New Mexico Environmental Department to reduce livestock impacts to the Santa Fe River.

In 2007 & 2008, cover/frequency inventories were conducted in the Tetilla and Bull Pastures. This information is being used to determine use patterns, species composition, ground cover, and species frequency. Data collected in these two sites indicated that current species composition and ground cover is within its natural range of variability as compared to PNC. This data indicates a static to upward trend in overall range condition.

## DIRECT AND INDIRECT EFFECTS ON VEGETATION

**Alternative 1 No Action:** Permitted livestock grazing would be eliminated from the allotment. Unauthorized livestock use and trespass could continue as allotment and Forest Service boundary fences continue to deteriorate.

This alternative could provide for an upward trend throughout most of the allotment within the first two years as key species forage species would not be utilized and therefore allow these plants to increase in size and vigor resulting in greater plant density and increased root mass. Areas that border the allotment could continue to receive use from unauthorized and trespass livestock as maintenance on boundary fences is discontinued. The majority of capable land could be in good condition within five years because of decreased impacts from livestock grazing.

Within key areas, it is anticipated that the desired plant community as described in appendix B could be achieved within a shorter time frame because of decreased impacts from livestock grazing.

**Alternative 2 Proposed Action:** By implementation of the adaptive management strategy as outlined in the proposed action, it is anticipated that the desired plant community described in appendix B will be achieved within the prescribed timeframes. Unauthorized livestock use and trespass could be alleviated on the allotment by repair and maintenance of existing range improvements and the majority of capable land could be in good condition within 10 years as a result of increased plant vigor and size resulting in greater plant density and increased root mass.

## CUMULATIVE EFFECTS ON VEGETATION

The area considered for cumulative effects is the geographic are collectively known as the Caja del Rio Plateau. This cumulative effects area was selected because it represents the extent in which permitted livestock grazing

and other Forest Service activities result in modification of vegetative types and would cause and impact to watersheds. The majority of the Caja del Rio Grazing allotment is contained within this geographic area.

Doleman et.al. (1979) describes the plateau as follows: "The limits of the Caja del Rio are marked by escarpments. The plateau is bounded on the northwest by White Rock Canyon and the Rio Grande, which separates it from the Jemez Mountain caldera and associated pyroclastic deposits of the Pajarito Plateau. To the southwest, the long La Bajada escarpment overlooks La Majada mesa and the lower reaches of the Santa Fe River where it opens into the Rio Grande Valley below the mouth of White Rock Canyon and modern-day Cochiti Lake. The escarpment averages 600 ft high and marks the La Bajada fault zone. The southern end of the plateau is cut abruptly from the east to the west by the 400 ft-deep Santa Fe River canyon. The plateau continues to the south where it is crossed by the Interstate 25 highway, which breaches the escarpment about 2 mi south of the canyon. The edge of the plateau is marked on the southeast by the Santa Fe River and on the east by the arroyo Calabasas, which drains south into the Santa Fe River. To the northeast, the Caja del Rio is bounded by Cañada Ancha, which drains north, then northwest to join the Rio Grande at the north end of White rock Canyon. Both Arroyo Calabasas and Caña Ancha drain a dissected upland area representing remnants of the regional surface that underlies the plateau volcanics.

The portion of the Caja del Rio Plateau which was considered for cumulative effects is an area which covers approximately 84,821 acres (133 square miles). Surface ownership of this area is approximately 772 acres are in private or state ownership. The effects of past, present and foreseeable actions are for the past ten years and those likely to occur in the next ten years. This timeframe would allow vegetation enough time to show change with the proposed management activities.

All permitted livestock grazing, wildfire, prescribed fire, timber harvesting, and other vegetative management activities conducted in the past and next ten years are the relevant federal actions that have a cause and effect relationship with the direct and indirect effects of permitting 520 head of livestock on the Caja del Rio grazing allotment.

The cumulative effects area contains three adjacent BLM grazing allotments Calabasas, Caja, Tetillas (BLM 2008). Up to 11,541 AUMs (846 head of cattle and 2 horses) can be grazed within the cumulative effects area including the Caja del Rio grazing allotment. Grazing on these allotments can occur year round. Monitoring on the Caja del Rio grazing allotments and adjacent BLM allotments indicates conservative to moderate use. No adverse impacts to riparian or upland rangelands have been identified from permitted livestock grazing within the cumulative effects area. The permitting of 520 head of livestock over the next ten years under conservative use guidelines and adaptive management on the Caja del Rio grazing allotment would not incrementally add to the effects of permitted grazing on these other allotments.

The Caja del Rio Wildhorse Territory which encompasses the entirety of the Caja del Rio grazing allotment has maintained an approximate population level of 50 horses. The effects from wildhorse use would not incrementally add to the effects of permitted grazing on these other allotments.

In 2002 approximately 1,500 acres of piñon-juniper thinning was completed within the Twin Hills pasture of the Caja del Rio grazing allotment. This project was undertaken to enhance the herbaceous understory component and provide for improved upland range conditions. This project along with a prescribed burn in 2006 within the same area contributed to the overall health of the herbaceous vegetative component. The effects from this project would not incrementally add to the effects of permitted grazing on these other allotments.

## THREATENED, ENDANGERED, AND SENSITIVE SPECIES

### AFFECTED ENVIRONMENT

**Federally Listed Species:** The Endangered Species Act listed, proposed, threatened, or endangered species and habitats are limited or do not occur on the allotments. None of the currently listed species, Rio Grande silvery minnow, Mexican spotted owl, and Holy Ghost Ipomopsis occurs within the allotment. No Critical Habitat exists for these species within the allotment. Species are from a list agreed upon by the US Fish and Wildlife Service and the USDA Forest Service Region 3 (USDA 2004). Since the list was accepted the Bald eagle has been delisted and put on the Regional Forester’s sensitive species list (USDA 2007).

**Table 7 - Federally Endangered Species**

Species	Status	Habitat Present
Mexican spotted owl (MSO) and MSO Critical Habitat	Threatened	There is no Protected Activity Center (PAC) within the allotment, no restricted riparian habitat, and no critical habitat present within the allotment (Fed Reg. 2004)
Rio Grande silvery minnow	Endangered	No habitat for this species within the allotment
Holy Ghost Ipomopsis	Endangered	No habitat for this species within the allotment

### Sensitive Species

The following table displays species that are known to occur or have habitat on the Santa Fe National Forest. Species are identified as occurring or are likely to occur on the allotment. Species were eliminated from evaluation based upon: lack of potential habitat: area not included in historic or current range of the species; or extirpation of the species without current feasibility for reintroduction.

**Table 8 - Regional Forester's Sensitive Species List 2007**

Common Name	Habitat or Species present on one or more allotment	Limiting Factors/Threats
Bald Eagle	Yes	No nesting/breeding habitat. Winter foraging habitat along the Rio Grande.
American Peregrine Falcon	Yes	Pesticides/chemicals, wind turbines. Nest disturbance during nesting season May-August.
Gray Vireo	Yes	Even aged forest mgmt, habitat fragmentation, improper livestock grazing, and cowbird parasitism. Changes in fire regime that bring about an increase in fire extent or frequency may be detrimental. Apparently secure (S4) in NM; however it is a NMDGF threatened species. This species is likely a rare transient to the Forests within NM.
Gunnison’s Prairie Dog	Yes	Vulnerable to poisoning, shooting, agriculture, urbanization, habitat fragmentation, disease. Limited distribution on the Forest. Candidate LPN 2 northeastern (montane) portion of its range.

Species were eliminated from evaluation based on: lack of potential habitat; are not included in historic or current range of the species. The following sensitive species and or their habitat does not occur within the allotment and will not be discussed further in this document: Jemez Mountain salamander; Northern Leopard Frog; Northern Goshawk; White-tailed ptarmigan; Western yellow-billed cuckoo; Burrowing owl; Boreal Owl;

Baird's Sparrow; Lilljeborg's pea-clam; Rio Grande chub; Rio Grande cut-throat; Rio Grande sucker; Cinereus (Masked) shrew; Dwarf shrew; Water shrew; Preble's shrew; Spotted bat; Pale townsend big-eared bat; Pika, Goat peak pika; Snowshoe hare; Yellow-billed marmot; Botta's pocket gopher; New Mexico banner tailed kangaroo rat; Southern red-backed vole; Western heather vole; Long-tailed vole; New Mexico meadow jumping mouse; American marten; Ermine; Southwestern river otter; Mink; and Rocky Mountain bighorn sheep.

No sensitive plants are known on the allotments due to lack of specialized habitats (New Mexico Rare Plants 2007).

**Bald Eagle:** Bald eagle is a transient during winter months and may occur occasionally during this time. Wintering eagles could occasionally forage over the Caja Plateau searching for food. Possible roosting or perching bald eagles may occasionally use the area on a temporary basis along the west edge of the plateau. There are no eagle nest trees or permanent roost areas in the analysis area.

**Peregrine Falcon:** Habitat occurs in open country and cliff areas characterized by steep, inaccessible sheer faces, generally exceeding 200 feet in height and adjacent to water. Suitable cliff habitat exists adjacent to the Caja del Rio grazing allotment.

**Gray Vireo:** The Gray vireo is a scrub-foraging inhabitant of some of the hottest, most arid regions of the southwestern United States and adjacent parts of northwestern Mexico. Well camouflaged by its drab gray plumage, this vireo's harsh, three- to four-note song is often the only indication of its presence. In Arizona and New Mexico, occurs in chaparral-juniper and dwarf conifer forests, as well as sites with Graves oak (*Quercus gravesii*), mixed piñon, and madrone (*Arbutus* spp.; [Phillips et al. 1964](#), [Barlow et al. 1970](#), [Hubbard 1970](#), [Barlow 1978](#)). Found in the Guadalupe and southern Sacramento mountains; the Organ and San Andres mountains; the southern Peloncillo mountains; the Silver City area; in the foothills of the Magdalena, Manzanita, and Sandia Mountains; western Santa Fe county; a few canyons in the western Zuni Mountains; and in San Juan and Rio Arriba counties in appropriate habitat. Species may be more widespread than currently known.

**Gunnison's prairie dog:** Gunnison's prairie dog habitat is prairie and intermountain meadows (montane) in northern NM. The Caja del Rio population is considered part of the prairie population (Federal Register 2008) which is not being considered for listing as threatened or endangered at this time. Prairie dogs usually inhabit grazed areas. It is believed grazing helps keeps vegetation at a height that allows the prairie dogs to see predators around their towns.

## **DIRECT, INDIRECT AND CUMULATIVE EFFECTS ON THREATENED, ENDANGERED, AND SENSITIVE SPECIES**

### **Federally Listed Species**

Cattle grazing through renewal of grazing permits and associated improvements of fences and water developments would have No Effect on the Mexican spotted owl. This determination meets the criteria designated in the USDA guidance criteria (USDA-FS, 2004) for a no effect determination, and is based on the following:

- No areas were identified as restricted habitat (mixed conifer and riparian areas, and slope in excess of 40percent not logged in the past 20 years outside a designated PAC) or critical habitat. These types of areas are not considered capable for cattle grazing.

- None of the proposed improvements would alter tree densities, snags, down woody debris, or other elements of habitat.
- No direct or indirect effects are anticipated for MSO due to implementation of this project. No Cumulative effects are anticipated.

### **Sensitive Species**

**Bald Eagle:** No nesting habitat or roost sites are within the allotment. The proposed action will have no impact to the Bald eagle. The “Guidance Criteria for Determining the Effects of Issuing Term Grazing Permits on Threatened, Endangered, or Species Proposed for Listing” (USFS 2002) was used as a guide for this determination. The project meets criteria #1 which states that: “Livestock grazing will not occur within any sub-watershed that drains any identified bald eagle nesting habitat or roost site.” There are no direct, indirect or cumulative effects to Bald eagle because activities no nest or roosts are known in the area.

**Peregrine Falcon:** No improvements are proposed within the falcon habitat area. Mitigation measures require any tank, fence, or corral construction activities within established habitat be conducted within limits placed on disturbance based on distance from nesting areas. Utilization levels are set so that enough forage or habitat will remain for cover and foraging use by prey species of falcons. Falcons have been successful in the area. No known effects associated with permitted cattle grazing are anticipated. Falcons feed on song birds and catch their prey in mid-air. The construction of water developments could slightly increase prey species by attracting them to the water source concentrating them for falcon predation. Disturbance by activity type is within the limits of tolerance by possible nesting falcons and outside of sensitive zones.

The proposed action should have no impact on this species. Livestock grazing is neutral to the falcon and potential peregrine prey. The proposed action would not be expected to decrease population viability or cause a trend to federal listing of this species.

**Gray Vireo:** No Gray vireo has been found on Forest Service part of the Caja del Rio Plateau. The Gray vireo has been found on the very southern end of the BLM land in an area known as the NM National Guard Training Area Camel Tracks (Arbetan and Muldavin 2002).

The proposed action should have no impact on this species. Livestock grazing as proposed should have no impact on the Grey vireo. The proposed action would not be expected to decrease population viability or cause a trend to federal listing of this species.

**Gunnison’s prairie dog:** Prairie dogs evolved with grazing. They will crop vegetation that reduces the visibility around the living area which can hide predators such as rattlesnakes or badgers. The primary threat to them throughout their range is sylvatic plague and uncontrolled shooting by target shooters (Federal Register 2008).

The proposed action should have no impact on this species. Livestock grazing benefits prairie dogs in are adapted to grazing from their association and shared habitat with American bison. The proposed action would not be expected to decrease population viability or cause a trend to federal listing of this species.

Since there are no direct and indirect effects there would be no cumulative effects.

## MIGRATORY BIRDS

### AFFECTED ENVIRONMENT

Migratory bird species that occur in the project area include the Black-throated gray warbler and the gray vireo. These species represent a habitat dominated by piñon juniper woodlands. New Mexico PIF lists priority species of concern by vegetation type. These species are listed as priority species Partners in Flight (PIF). New Mexico PIF considers eight risk factors in identifying conservation priority species: Global Abundance, NM Breeding Abundance, and Global Breeding Distribution, Threats to Breeding in NM, Importance of NM to Breeding, Global Winter Distribution, and Threats on Wintering Grounds.

The following species will not be analyzed because either they are not found in the project area or not found on the Santa Fe National Forest: Ferruginous hawk, Gray flycatcher, and Bendire’s thrasher.

The following are designated Important Bird Area (IBA) not affected by the project. IBA on or adjacent to the Santa Fe National Forest are the Chama River Gorge/Golondrino Mesa (SFNF and BLM), the Caja del Rio (BLM), Randall Davey Center (National Audubon Society), and Santa Fe Canyon Preserve (The Nature Conservancy) and Santa Fe River (Bureau of Reclamation). A proposed IBA is Pecos Canyon (SFNF). There is no association or important link between the bird communities and these IBA. Therefore, these no IBA is affected by the project.

The Caja del Rio (BLM) is adjacent land to the Caja del Rio grazing allotment (FS). Gray vireo has been found on the BLM portion. Actions proposed will not be in immediate proximity to the Gray vireo on the BLM land.

Many important over wintering areas are large wetlands. Important overwintering areas recognized on the Forest include: Rio Chama and Rio Grande corridors. The project area is not recognized as an important overwintering area because significant concentrations of birds do not occur here nor does a unique or a high diversity of birds winter here.

### DIRECT, INDIRECT, AND CUMMULATIVE EFFECTS

Effects are temporary disturbance to species and no other activities are ongoing or anticipated that would cause additional effect. There are no cumulative effects to any of the migratory bird species.

## MANAGEMENT INDICATOR SPECIES (MIS)

### AFFECTED ENVIRONMENT

The Land and Resource Management Plan for the Santa Fe National Forest, adopted in 1987, identified 8 Management Indicator Species (MIS). These species include: Merriam’s Turkey, pinyon jay, hairy woodpecker, mourning dove, Mexican spotted owl, Rocky Mountain elk, Rocky Mountain bighorn sheep, and Rio Grande cutthroat trout.

Only the Pinyon Jay, Mourning Dove, and the Rocky Mountain Elk will be assessed. Other species will not be considered due to the lack of presence or suitable habitat within the project area. The Mexican spotted owl was discussed previously in the federally threatened and endangered species section.

**Table 9 - Management Indicator Species**

Common Name	Assessed	Rationale
Piñón Jay	Yes	Habitat and Species present in area
Mourning Dove	Yes	Habitat and Species present in area

Common Name	Assessed	Rationale
Rocky Mountain Elk	Yes	Habitat and Species present in area

**Piñón Jay:** Pinyon jays nest mainly in stands of piñon-juniper. It needs open woodlands for nesting and an adequate supply of seeds, especially nuts (Terres 1980). They are gregarious and breed in colonies up to 150. They spend the winters in large flocks of 10’s or 1,000’s moving in search of piñon stands with a successful crop of piñon nuts that are a primary food source along with other seeds, fruits and insects.

Stands of piñon-juniper provide the habitat for the piñón jay on the Santa Fe National Forest. There are some piñon-juniper stands in the project area, which would provide suitable habitat for this species. Most of the project occurs in piñon-juniper habitat type.

**Mourning Dove:** Mourning Dove is found across North America in many types of habitat including most forest types. It is wide spread except in the Arctic and closed forests. It is abundant and increasing near farms and suburbs. It frequents backyard feeders, suburbs, and towns. They are common to abundant in most counties in New Mexico.

Throughout the Santa Fe National Forest, Mourning dove habitat is abundant. This species is primarily found in lower elevations of the Forest, however, they are found in Douglas-fir, ponderosa pine, spruce-fir, aspen, and piñon-juniper forest types. Coniferous trees and ground sites are preferred early in the year before deciduous trees have developed leaves. In all situations however, abundant food and water must be available within 20-30 km. These habitats and grassland habitats found on the Forest meet the feeding requirements for the Mourning dove. Water developments and under burning in ponderosa create favorable feeding areas. The abundance of nesting and cover opportunities on the Santa Fe contribute to maintaining viable populations of Mourning dove.

**Rocky Mountain Elk:** Rocky Mountain elk inhabit most forest types with good forage and cover. The ungulates utilize a variety of habitat types. They appear to be extremely adaptable to both secondary successional and specific successional vegetation types. Habitat types differ in value to elk due to aspect, elevation, snow depth, lack of water availability and/or vegetation components. Canopy closure due to the suppression of fire has occurred from and reduced understory forage production. Since elk are grazing animals this limits the amount of available habitat. The area provides suitable habitat for elk during the spring and fall.

**DIRECT, INDIRECT, AND CUMMULATIVE EFFECTS ON MIS SPECIES**

Direct and indirect effects are structural improvements and grazing. Forage available will remain the same but improved distribution will benefit the allotment without areas of overuse. Vegetation holds the soil and reduces soil loss to wind. Greater vegetation cover should allow for an increase in seed heads, cover and insects as food sources available for birds. No other effects are known or expected. No cumulative effects are expected.

**RECREATION**

**AFFECTED ENVIRONMENT**

Most of the Caja del Rio is within Management Area G in the Santa Fe National Forest Plan. These areas are generally open to OHV travel. The land will should be managed for ROS settings of Roaded Natural and Semi-Primitive Motorized. The area adjacent to the Rio Grande on the West side of the Caja del Rio is within Management area L which is managed for outstanding opportunities for dispersed recreation characterized by a moderate to high probability of experiencing isolation from other users

Recreational activities in the Caja del Rio area mainly consist of dispersed camping, recreational shooting, hunting, ATV and dirt bike riding, horseback riding, and to a lesser degree, mountain biking and hiking. This portion of the Forest is considered to be of moderate recreation use. With the City of Santa Fe building closer and closer to this area, use levels are increasing rapidly. Recreation facilities (ball fields, golf course, etc.) and government facilities are newly built in close proximity to the Caja del Rio. The Buckman Crossing portion of the Caja del Rio is the only place on the Santa Fe National Forest where a vehicle can access the Rio Grande. Recreational use appears to be primarily from locals, with some out-of-area forest visitors or tourists. The exception is during special recreation events that are annually permitted when there is fairly heavy use from locals as well as non-locals.

There are no developed campgrounds, picnic areas, or other developed recreation facilities within the allotment. Trailheads are undeveloped and lack signing and/or informational kiosks. The trail junctions themselves are scarcely signed. There appears to be moderate pedestrian use of the trails. There appears to be more use of the trails by motorized vehicles and equestrians.

In spite of the lack of developed facilities, this area has tremendous recreational potential, including scenic vistas, natural features of interest, historic attractions (Buckman Townsite, Chili Line Railroad, Historic Route 66, El Camino Real), as well as opportunities for solitude.

Significant OHV use is apparent within Forest Road 24 particularly at locations near the headquarters, 700 well, 1100 well, tank thirty one, and Canda Ancha. These areas are typically denuded of vegetation by OHV use. In addition fences and corrals near these areas are regularly vandalized and torn down. Water storage tanks and stock tanks are regularly shot at. Welding bullet holes on shot stock tanks is a common maintenance task.

There have been no recent substantial past actions such as trail construction or campground development within the project areas.

**Inventoried Roadless Areas:** There are two Inventoried Roadless Areas within the Caja del Rio Grazing allotment. Inventoried Roadless Areas (IRAs) are administrative units within the national forest that have special management restrictions that differ by type including restrictions on road building and timber removal. Grazing and recreation, as well as some motorized travel are allowed within IRAs.

**Developed Recreation:** There are no developed recreation sites such as campgrounds, picnic grounds, and developed trailheads within the allotments.

**Dispersed Recreation:** Recreation activities in the allotment generally are of a dispersed and unregulated nature, including hunting, camping, recreational shooting, rock climbing, and spelunking, float boating, wildlife watching, and riding/driving forest roads and trails.

**Trails and Trailheads:** There are trails throughout the allotment. Due to the elevation of the Caja del Rio being lower than the surrounding national forest land, the trails are accessed year round. Most trails are used by equestrian or motorized users, but some hikers and mountain bikers are present. Trails leading from the Caja del Rio Plateau into White Rock Canyon and the Rio Grande, are closed to motorized use, other trails are open to this use.

**Special Use Permits:** Outfitter/Guide Special Use permits issued for the Caja del Rio exist of Jeep tours, rock climbing, and float boating on the Rio Grande. Mountain biking and guided hiking, as well as hunting permits have been inquiries or past permits issued in the area. Another permitted activity that happens with relative frequency on the Caja del Rio is Commercial Filming, especially in the Diablo Canyon area. There are some

recreational activities that are more organized and may require permitting in the near future. For example, an organized group of recreational equestrians who routinely reenact a European type fox hunt has requested placing horse jumping structures on fence lines. There are also recreation event permits such as, organized equestrian endurance rides that are permitted annually.

## DIRECT, INDIRECT, AND CUMULATIVE EFFECTS ON RECREATION

**Dispersed Recreation:** Under the alternative 1, the quality of dispersed recreation experiences for many people would improve, due to the absence of cattle. This includes the absence of or a reduction of flies and cow manure, increased vegetation, decreased dust, and an increase in wildlife (including wild horses) sightings and hunting opportunities as competition with cattle is eliminated. Vandalism of range infrastructure would continue under this alternative.

**Special Use Permits:** Special Use permits presently issued in the area are primarily for special recreation use events and therefore, only limited numbers of days per year. Equestrian events benefit from water available at tanks that is there for cattle and wildlife. If grazing were discontinued, recreational use livestock (equine) would no longer have access to some of this water which is brought in by grazing permittees. The area could become more attractive as a recreation resource to non-livestock recreational users and that an increase in other forms of recreation could lead to more interest in recreation Special Uses.

## CULTURAL RESOURCES

### AFFECTED ENVIRONMENT

In the project area, 17,680 gross acres (7,154 hectares) or 26% of the 66,873 gross acres (27,063 hectares) of Forest System lands within the allotment has been subject to some form of heritage investigation varying from intensive survey to site recording completed for archaeological field schools. Of this, 7,916 acres (3,204 hectares) of valid cultural resource survey were completed prior to survey efforts for this project. Based on this figure approximately 12% of the total project area has been subject to valid cultural resource survey. A literature search of Santa Fe National Forest heritage resource site files revealed that 517 heritage resource sites have been previously identified within these allotments. The majority of cultural resources represent discrete and extensive flaked stone scatters, small pueblos, masonry rooms, historic trash, corrals, isolated walls and occasional foundations. These resources date from early pre-historic (Archaic) times, through Ancestral Pueblo (sedentary) occupations. Historic uses are reflected in the Buckman townsite, the Chile Line Railroad, the Caja Headquarter's Well, ranching and recreation. Of the documented heritage sites, one site, La Bajada Agricultural Fields (AR-03-10-06-193/LA 38918) is listed on the National Register of Historic Places, 118 sites have been previously determined eligible for the National Register, the eligibility for 392 sites is unevaluated at this time, and 7 sites have been determined not eligible. Nine are the subject of new eligibility determinations including AR-03-10-06-0221/LA 5 an extensive pueblo complex as a result of evaluation for this permit reissuance.

There are two Forest Plan Management I-Areas, a special management area with high value cultural resources. Emphasis in these areas is on active management of the cultural resources including protection, stabilization, interpretation, evaluation and opportunities for research (Santa Fe National Forest 1987:135). This emphasis does not preclude authorizing other uses such as grazing within the boundaries of an area provided they do not adversely affect the qualities that make historic properties in them eligible for the National Register. These include the La Bajada and the Rio Grande I-Areas.

## DIRECT, INDIRECT, AND CUMULATIVE EFFECTS ON CULTURAL RESOURCES

**Alternative 1 – No Action (No Grazing):** If there is no grazing on the Caja del Rio there will no impacts to resources typically associated with cattle concentration areas, residence time or trailing near or through archaeological sites. There will be no effects created by permittee administration activities such as tank or pipeline construction or use of existing roads. Lack of grazing however, does not preclude other impacts created by off road use, other recreation activities and horseback riding that are similar to grazing effects and are occasionally found in the same areas as those impacts observed by grazing.

**Alternative 2 – Proposed Action:** On the Caja del Rio grazing allotment, up to 492 cow/calf pairs and 28 bulls are allocated under an 8-pasture deferred rotation grazing system with year –round grazing. These cattle are spread over 66,000 acres. There is no live water or riparian areas. Water for cattle is created through pipelines, earthen tanks, drinkers and ring tanks. All proposed pipelines have been surveyed for heritage resources and there are either no sites or the one documented site will be avoided by pipeline and drinker placement. Cattle impacts observed during this evaluation are frequently low to moderate and of restricted duration and are most notable in areas where heritage sites are located near existing tanks or drinkers. Provided cattle numbers are not increased and monitoring of heritage sites near tanks and congregation locals is continued, or if salting is not placed in areas where heritage sites do occur, continued grazing at the current stocking levels will have no indirect or cumulative effect on cultural (heritage) resources. Permit reissuance will be considered to have a no adverse effect on heritage resources sites.

## ENVIRONMENTAL JUSTICE AND SOCIAL ECONOMICS

### AFFECTED ENVIRONMENT

#### Environmental Justice

Presidential Executive Order 12898 requires Federal agencies to respond to the issue of environmental justice by “identifying and addressing disproportionately high and adverse human activities on minority and low income populations.” The effects of the propose management activities are to encompass both human health and environmental effects, and are to include the cumulative and indirect effects on a community.

The Caja del Rio grazing allotment in located primarily (90 percent) in Santa Fe County, New Mexico. A small portion of the allotment is also located in Sandoval (9 percent) and Los Alamos County (<1 percent). Approximately 19percent of Santa Fe County is in Forest Service ownership. In 2006, the population of Santa Fe County was estimated at 142,497 and consisted of approximately, 49.5 percent Hispanic, 45.1 percent White (Non-Hispanic), and 3.4percent Native American. Approximately 55percent of the population is minority. The median household income in 2004 was \$43,727 with 12 percent of the population in Santa Fe County is below the poverty level (U.S. Census Bureau Quick Facts).

Implementation of either of the alternatives evaluated in this EA would not result in adverse impacts to environmental resources and socioeconomic conditions. Therefore, disproportionate direct, indirect, or cumulative adverse impacts on low income or minority populations would not occur.

#### Economics

The Caja del Rio grazing allotment is located primarily within Santa Fe County, New Mexico. The county contains approximately 460 farms (down 11 percent since 1997) which total approximately 683,508 acres with

average farm size of 1,486 acres. Livestock sales in Santa Fe County accounted for \$3,056,000 of the total market value of agricultural production and ranked 30<sup>th</sup> in the state in cattle and calf production (National Agricultural Statistics Service 2002). Ranching operations in the area tend to be characterized by small profit margins with the need for off-ranch supplemental income to continue operations. Farming and ranching are traditional uses in the county. In 2000, farming and forestry occupations accounted for 1.4 percent of total employment in Santa Fe County (U.S. Census Bureau 1990).

The economic effects of the proposal were not identified as a key issue for the analysis. Nevertheless, the economic considerations of the alternatives can be compared in terms of the costs of implementation, the costs, and revenues to the permittees and the return to the Federal government through grazing permit receipts. Costs and benefits are incurred by both the Federal government and the permittees, and not all participants recover their costs. Specific operating costs and revenue estimates are not available for the allotments, and weather, market conditions, business, and management decisions will affect net revenue on an annual basis.

The analysis does not include certain costs or benefits incurred by the alternatives, such as costs and benefits relating to recreation opportunities, environmental quality, etc. Data to analyze these costs and benefits are not available at the allotment level; analysis at the District or Forest level is beyond the scope of the decision.

Decisions relative to livestock grazing on individual allotments primarily affect: 1) the permittees, who pay grazing fees and receive economic returns on their investments in livestock grazing and who contribute funds for the construction of range improvements; and 2) the Forest Service, which collects grazing fees and expends grazing receipts and appropriated tax dollars to construct improvements and to administer the allotments. Local communities may also benefit indirectly from the sale of goods and services associated with ranch operations.

**Costs:** Costs associated with the project include the costs of proposed improvements and ongoing administrative costs associated with permit administration. Alternative 1 would have the lowest cost as no new improvements would be authorized and only limited maintenance would occur. There would still be a costs associated with management of the allotments. Maintenance or removal of existing structural improvements may become necessary and costs would be borne by the Forest Service. Allotment boundary fence maintenance would be shifted from the permittees to the Forest Service. In addition, at least on monitoring trip would be conducted to verify that unauthorized livestock from adjacent allotment are not present under alternative 2, there would be costs associated with the construction of new improvements. Improvements have been identified as possible practices as part of an adaptive management strategy. Based on the results of monitoring, some improvements may be determined to be unnecessary. Therefore specific costs are difficult to predict. Typically, improvements are constructed on a cost-share basis between the Forest Service and the permittee. The projected total cost to the Forest Service for permit administration, range inspections, and materials for construction of new pipeline over the next ten years is estimated at \$218,385. Annual permit administration and allotment monitoring would cost approximately \$18,000 over the next ten years.

**Revenues:** Net ranch income represents gross returns minus operating costs. Specific operating costs and revenue estimates are not available for each ranch, and weather, market conditions, and management decisions will affect net revenue on an annual basis. Thus the use of permitted numbers may overestimate net income on the Forest allotments. Nevertheless, termination of the grazing authorizations under alternative 1 is likely to have significant economic effects on the individual permittees. Although they would no longer pay grazing fees or expend money to maintain the allotments or construct improvements, the permittees would not have access to forage on federal lands with which to generate income from livestock production.

Under alternative 1, the Forest Service would not receive annual grazing fee payments. The Forest Service would continue to collect grazing fee payments under alternative 2, but would vary based on annual stocking levels. If full permitted livestock were authorized annually under the current grazing fee (1.35/AUM), approximately \$71,016 would be collected over the next ten years. This would increase if grazing fees increased over the next ten years.

Money generated within a community by permittees purchasing goods and services continues to circulate and accounts for indirect contributions to the local economy. Under alternative 1, these economic contributions are likely to be reduced. These expenditures would continue at current levels under alternative 2.

**Economic Viability:** The economic viability of individual ranches or the ranching community at large is subject to a variety of influences. Market fluctuations, weather, rancher management decisions, ranch expenses, and the availability of other sources of income could all affect the economic viability of individual ranches. These factors are beyond the control of the Forest Service and beyond the scope of the decision being contemplated. On ranches where the Forest Service lease comprises a significant proportion of the forage base, alternative 1 could affect the economic viability of the ranch. Under alternative 2, no significant changes in permitted use are proposed and actual use is expected to remain similar to recent past use; therefore the proposed action is unlikely to affect the economic viability of individual ranches. The moderate stocking and utilization rates proposed are consistent with existing research that indicates that such practices can optimize financial return over the long term.

## CHAPTER 4 – CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, state and local agencies and non-Forest Service persons during development of this environmental assessment.

### LIST OF IDT MEMBERS

Name	Title	Responsibility and Expertise
Alicia Gallegos	Rangeland Management Specialist	Range Management
Anne Baldwin	Archeologist	Cultural Resources
Brent Abel	Archeologist	Cultural Resources
Brian Davidson	Range Program Manager	IDT Leader
Carlos Lovato	Watershed Technician	Range Management
Carol Van Dorn	Hydrologist	Soil and Watershed
Chantel Cook	Fisheries Biologist	Fisheries
Donald Serrano	Rangeland Management Specialist	Range Management
Esther Nelson	Wildlife Biologist	Wildlife
James Munoz	Recreation Specialist	Recreation
Mary Orr	Wildlife Biologist	Wildlife
Michael Lujan	Rangeland Management Specialist	Range Management
William Eaton	Rangeland Management Specialist	Range Management, GIS
James Simino	Fisheries Biologist	Fisheries

### LIST OF OTHER AGENCIES CONSULTED

Name of Agency
New Mexico Game and Fish Department
New Mexico State Historical Preservation Office

**APPENDIX A - REFERENCES**

- Arbetan, P., K. Johnson, and E. Muldavin. 2002. Report of faunal surveys for the Gray Vireo and Black-tailed and Gunnison's Prairie Dog at the New Mexico Army National Guard Camel Tracks Training Site. Unpublished report to the New Mexico Army National Guard Environmental Office by the New Mexico Natural Heritage Program. NMNHP Report: 02- GTR 222.
- Audubon Society. Cowbirds and Conservation. <http://www.audubon.org/bird/research/#introduction> Accessed June 2008
- Barlow, J. C., S. N. Leckie, and C. T. Baril. 1999. Gray Vireo (*Vireo vicinior*). In *The Birds of North America*, No. 447 (A. Poole and F. Gill, eds.). In *The Birds of North America*, Inc., Philadelphia, PA.
- Elliott, William, D. Hall, D. Scheele, USDA Forest Service, Rocky Mountain Research Station, FSWEPP , Disturbed WEPP. Online at <http://forestmoscowfl.wsu.edu/fswepp>
- Holechek, Jerry L. and Dee Galt. 2000. Grazing Intensity Guidelines *in Rangelands* 22 (3). June 2000. pp 11-14.
- Holechek, Jerry L., Rex D. Piper, and Carlton H. Herbal. 1989. *Range Management Principles and Practices*. Prentice-Hall, Inc. Englewood Cliffs, NJ.
- Hubbard, J.P., Conway, M.C., Campbell, H., Schmitt, G., and Hatch, M.D. 1979. *Handbook of Species Endangered in New Mexico*. New Mexico Department of Game and Fish.
- McNabb, W.H.; Cleland, D.T.; Freeouf, J.A.; Keys, Jr., J.E.; Nowacki, G.J.; Carpenter, C.A., comps. 2007. Descriptions of ecological subregions; senction of the conterminous United States [CD-ROM]. Gen. Tech. Report WO-76B. Washington, DC: U.S. Department of Agriculture, Forest Service, 80p.
- Milchunas, Daniel G. 2006. *Response of Plant Communities to Grazing in the Southwestern United States*. USDA Forest Service. RMRS-GTR-169.
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available: <http://www.natureserve.org/explorer>. Accessed June, 2007.
- New Mexico Department of Game and Fish (NMDGF) 2007 Gray vireo (*Vireo vicinior*) recovery plan. New Mexico Department of Game and Fish, Conservation Services Division, Santa Fe, New Mexico. 30p
- New Mexico Department of Game and Fish (NMDGF). 2006. Status Report and Biological Review of the Gray Vireo in New Mexico. Authors, John P. Delong and Sartor O. Williams III. New Mexico Department of Game and Fish, Santa Fe, New Mexico. 30p
- New Mexico Department of Game and Fish (NMDGF). 2006. Status Report and Biological Review of the Gray Vireo in New Mexico. Authors, John P. Delong and Sartor O. Williams III. New Mexico Department of Game and Fish, Santa Fe, New Mexico. 30p
- New Mexico Department of Game and Fish. 2007. BISON-M (Biota Infor mationSystem of New Mexico): Biological database for New Mexico. <http://www.bison-m.org> Accessed May 04, 2007
- New Mexico Environment Department, Surface Water Quality Bureau. 2008 - 2010 State of New Mexico Integrated Clean Water Act §303(d)/§305(b) Report.
- New Mexico Rare Plant Technical Council. 1999. *New Mexico Rare Plants*. Albuquerque, NM: New Mexico Rare Plants Home Page. <http://nmrareplants.unm.edu> (Latest update: 19 April 2007).

- Raish, Carol. 2004. Assessment of grassland ecosystem conditions in the Southwestern United States. Volume 1. Gen. Tech. Rep. RMRS-GTR-135-vol. 1. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 86-119
- Raish, Carol; McSweeney, Alice M. 2003. Economic, Social, and Cultural Aspects of Livestock Ranching on the Española and Canjilon Ranger Districts of the Santa Fe and Carson National Forests: A Pilot Study. Gen. Tech. Rep. RMRS-GTR-113. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 89 p.
- Terres, J. K. 1980. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf, New York, NY.
- U.S. Census Bureau Quick Facts 2008, <http://quickfacts.census.gov/qfd/states/> Accessed August 2008.
- United States Geological Survey. 2004. Patuxent Bird Population Studies. <http://www.mbr-pwrc.usgs.gov/>.
- USDA Forest Service. 1987. Environmental Impact Statement, Santa Fe National Forest Plan. Santa Fe National Forest: Santa Fe, NM.
- USDA Forest Service. 2005. Framework for Streamlining Informal Consultation for Livestock Grazing Activities. USDA Forest Service Southwestern Region. March 15, 2005. U.S. Region 3 Office, Albuquerque, NM.
- USDA Forest Service. 2006. Management Indicator Species Assessment, Santa Fe National Forest. June 2006. Santa Fe National Forest Supervisor's Office, Santa Fe, New Mexico.
- USDA National Agricultural Statistics Service [http://www.nass.usda.gov/Data\\_and\\_Statistics/](http://www.nass.usda.gov/Data_and_Statistics/) Accessed June 2009.
- USDA Natural Resource Conservation Service. Plants Database. July 2007. <http://plants.usda.gov/>.
- USDI, Fish and Wildlife Service. 1993. Rule to list the Mexican spotted owl as a threatened species. Federal Register, Volume 58, Number 49. March 16, 1993. Rules and Regulations: 50 CFR Part 17. RIN 1018-AB 56. Washington DC: US Department of Interior, Fish and Wildlife Service: 14248-14271.
- Valentine, John F. 2001. Grazing Management, 2<sup>nd</sup> Edition. Academic Press, San Diego, California.

## **APPENDIX B – EXISTING AND DESIRED CONDITIONS**

The following tables are summaries of the potential, existing, and desired conditions for full capacity range sites within the Caja del Rio grazing allotment.

Rangeland inventory and analysis on the Santa Fe National Forest begins with identifying TES mapping units for the landscape. The TES map unit is the standard ecological unit that provides basic information for range management planning. TES provides the hierarchical framework of ecological units from which resource conditions (existing and natural conditions) can be assessed. Information on soils, climate, vegetation, geology, and landform is provided by TES.

The canopy cover of the vegetation and species frequency is collect on the existing plant communities within the full capacity TES units. This data is used to determine the array of spatial arrangement of desired plant communities as compared to the potential natural communities (PNC). Each TES mapping unit has a description of the potential plant community. A community similarity index is used to make the comparison of the existing and potential plant community with the desired plant community. The desired plant communities are part of what is considered the desired condition.

All data and computation are located in the project record. Methodologies follow the Southwest Rangelands Analysis and Management Training Guide (1987). A plant list along with the NRCS plant symbol codes for the most dominate species can be found at the end of this appendix.

Caja del Rio TEU – 500, Tank Eighteen					
Designated Area - TES Unit 500-Lowland, 4%. This TEU site occurs on nearly level to moderately sloping valley plains with an average slope length of 98 feet (USDA 1983). Soils are deep loam Typic Haplustalfs. Drainages associated with the site are in a linear in pattern. Slopes average 4% with elevation ranges from 6,500 to 6,800 feet above sea level. This site is a meadow with scattered piñon and one seed juniper. Blue grama is the dominant grass species and occupies over 60% of the identified plant species inventoried in 2008. Data collected in 2008 suggest the site is in a stable to upward trend due to the overall vigor of inventoried plant species.					
			Vegetation (Canopy Cover)		Soils (Ground Cover %)
Potential (refer to TES unit 500 description)	Grasses	Forbs	Shrubs	Bare soil	30
	11 species	6 species	3 species	Rock	10
	26.9% c. cover	1.5% c. cover	15% c. cover	Litter	45
	Bogr 20% Bocu 4%	Caoc 1% Erme 0.5%	Artr 15%	Vegetation	25
Desired Condition	Grasses	Forbs	Shrubs	Bare soil	15-35
	9-11 species	5-6 species	4-5 species	Rock	5-15
	20-40% c. cover	0-5% c. cover	5-20% c.cover	Litter	35-50
	Bogr 30 - 45%	Artr 8%	Artr2 8%	Vegetation	20-50
	Bocu 2%	Spco 12%	Gusa2 5%		
	Elelb2 4% Spcr 3%	Plpa2 12%	Jumo 8		
Existing Condition	Grasses	Forbs	Shrubs	Bare soil	50
	5-7 species	3-4 species	0-5 species	Rock	10
	20-40% c. cover	0-10% c. cover	5-25% c.cover	Litter	10
	Bogr 70%	Pool 22%	Artr2 0.5%	Vegetation	30
	Plja 23%	Spco 23%	Gusa2 9%		
	Elelb2 7%	Plpa2 5%	Jumo 1%		
	Spcr 6% Pasm 0.5%				
Desired Plant Community	The site would be deviate from what is described in the Potential Natural Community and point toward a site with greater forb diversity than what is described in TEU. The blue grama community would increase by 56% to better reflect current conditions. Other grama species would increase in frequency. Under adaptive management, conservative use levels, and favorable climatic conditions, resource conditions would substantially move toward the desired conditions as described within the next ten years.				
Objectives	Achieve the Desired Plant Community for Tank eighteen within 10 years as described and maintain a community similarity index that demonstrates a high similarity to desired index. Bare ground would be maintained at 50%, rock at 10%, and litter at 10% and vegetation at 30%. Forage production would be maintained between 200 and 500 lbs/acre however annual fluctuations in precipitation would need to be taken into account.				
Ecological Status	Potential Community Similarity Index = 17%. This equates to a low similar to early seral stage as compared to the potential as described for TES unit 500. Desired Community Similarity Index = 67%. This equates to a high similar to late seral stage as compared to the desired plant community.				

Caja del Rio TEU – 506, Placitas					
Designated Area - TES Unit 506 - Elevated plains. This TEU site occurs on nearly level to moderately sloping valley plains with an average slope length of 115 feet (USDA 1983). Soils are deep loam Typic Haplustalfs. Drainages associated with the site are in a linear in pattern. Slopes average 4% with elevation ranges from 6,300 to 7,000 feet above sea level. This site is a meadow with scattered piñon and one seed juniper. Blue grama is the dominant grass species and occupies over 70% of the identified plant species inventoried in 2008. Data collected in 2008 suggest the site is in a stable to upward trend due to the overall vigor of inventoried plant species.					
	Vegetation (Canopy Cover)			Soils (Ground Cover %)	
Potential (refer to TES unit 506 description)	Grasses 13 species 24.9% c. cover Bogr 20% Bocu 4%	Forbs 4 species 0.5% c. cover Erme 0.5%	Shrubs 5 species 1% c. cover Cemo 1%	Bare soil 30 Rock 5 Litter 40 Vegetation 30	
Desired Condition	Grasses 10-13 species 20-30% c. cover Bogr 45% Plja 20% Elelb2 4% Spcr 1% Bocu 2%	Forbs 3-4 species 0.5% c. cover Ardr 0.5% Peam 1% Ardr 0.5%	Shrubs 4-5 species 0-5% c. cover Gusa 6% Lypa 0.5 Oppo 1	Bare soil 25-40 Rock 0-10 Litter 30-50 Vegetation 20-50	
Existing Condition	Grasses 13 Species 50% c. cover Bogr 70% Plja 42% Elelb2 3% Spcr 2% Moto 0.5	Forbs 4 species 0.5% c. cover Ardr 0.5% Peam 1%	Shrubs 4-5 species Gusa 12% Lypa 0.5 Oppo 2	Bare soil 50 Rock 0 Litter 18 Vegetation 32	
Desired Plant Community	The site would be similar of what is described in the Potential Natural Community with noted exceptions. The blue grama community would increase by 55% and galleta community would increase by 100% to better reflect current conditions. Other grama species would increase in frequency as described above. Under adaptive management, conservative use levels, and favorable climatic conditions, resource conditions would substantially move toward the desired conditions as described within the next ten years.				
Objectives	Achieve the Desired Plant Community for Placitas within 10 years and maintain a community similarity index that demonstrates a high similarity to desired index. Bare ground would be maintained at 50%, rock at 1%, and litter at 18% and vegetation at 31%. Forage production would be maintained between 275 and 750 lbs/acre however annual fluctuations in precipitation would need to be taken into account.				
Ecological Status	Potential Community Similarity Index = 25%. This equates to a mid similar to early seral stage as compared to the potential as described for TES unit 500. Desired Community Similarity Index = 72%. This equates to a high similar to late seral stage as compared to the desired plant community.				

Caja del Rio TEU – 507, Tetilla #1					
Designated Area - TES Unit 507 - Elevated plains. This TEU site occurs on nearly level to moderately sloping valley plains with an average slope length of 115 feet (USDA 1983). Soils are deep loam Typic Ustochrepts. Drainages associated with the site are in a linear in pattern. Slopes average 4% with elevation ranges from 6,000 to 6,400 feet above sea level. This site is a flat open grassland with galleta as the dominant grass species which occupies over 50% of the identified plant species inventoried in 2008. Data collected in 2008 suggest the site is in a stable to upward trend due to the overall vigor and production of inventoried plant species.					
	Vegetation (Canopy Cover)			Soils (Ground Cover %)	
Potential (refer to TES unit 507 description)	Grasses 14 species 46.7% c. cover Bogr 25% Bocu 6% Agsc 4%	Forbs 4 species 0.7% c. cover Caoc 0.5% Erme 0.2%	Shrubs 5 species 1% c. cover Eula 1%	Bare soil	55
				Rock	5
				Litter	10
				Vegetation	30
Desired Condition	Grasses 10-14 species 40-55% c. cover Bogr 35% Plja 29% Elelb2 3% Spcr 4% Muto 3% Ardi5 5%	Forbs 3-4 species 0-5% c. cover Hyri 5% Spco 6%	Shrubs 4-5 species 0-3% c. cover	Bare soil	45-60
				Rock	0-10
				Litter	5-15
				Vegetation	20-40
Existing Condition	Grasses 13 Species 50% c. cover Bogr 42% Plja 55% Elelb2 5% Spcr 5% Muto 6% Ardi5 10%	Forbs 3-4 species 0-5% c. cover Hyri 5% Spco 6%	Shrubs 4-5 species 0-3% c. cover	Bare soil	56
				Rock	0
				Litter	27
				Vegetation	17
Desired Plant Community	The Desired Plant Community would represent a condition that is generally midpoint between existing and potential. This mid point is desired since it will allow for plant species described in the potential natural community to be present in the Desired Plant Community. Under adaptive management, conservative use levels, and favorable climatic conditions, resource conditions would substantially move toward the desired conditions as described within the next ten years.				
Objectives	Achieve the Desired Plant Community for Tetilla #1 within 10 years and maintain a community similarity index that demonstrates a high similarity to desired index. Bare ground would be maintained at 56%, rock at 0%, and litter at 27% and vegetation at 17%. Forage production would be maintained between 425 and 1000 lbs/acre however annual fluctuations in precipitation would need to be taken into account.				
Ecological Status	Potential Community Similarity Index = 32%. This equates to a mid similar to early seral stage as compared to the potential as described for TES unit 500. Desired Community Similarity Index = 73%. This equates to a high similar to late seral stage as compared to the desired plant community.				

Caja del Rio TEU – 509, Tetilla #2					
Designated Area - TES Unit 509 - Elevated plains. This TEU site occurs on nearly level to moderately sloping valley plains with an average slope length of 115 feet (USDA 1983). Soils are deep loam Typic Haplustalfs. Drainages associated with the site are in a linear in pattern. Slopes average 4% with elevation ranges from 6,200 to 6,900 feet above sea level. This site is a meadow with scattered one seed juniper. Blue grama is the dominant grass species and occupies over 60% of the identified plant species inventoried in 2008. Data collected in 2008 suggest the site is in a stable to upward trend due to the overall vigor of inventoried plant species.					
	Vegetation (canopy cover)			Soils (Ground Cover %)	
Potential (refer to TES unit 509 description)	Grasses 15 species 50.7% c. cover Bogr 30% Bocu 8% Boer 5%	Forbs 4 species 0.7% c. cover Caoc 0.5% Erme 0.2%	Shrubs 5 species <0.1% c. cover	Bare soil 50 Rock 5 Litter 15 Vegetation 30	
Desired Condition	Grasses 12-15 species 45-70% c. cover Bogr 40% Plja 25% Elelb2 1% Spcr 5% Muto 5% Ardi5 0.1% Pasm 0.5% Bocu 3% Boer4 1%	Forbs 3-4 species 0-3% c. cover Arfr4 0.1% Peam 5% Rata 0.5	Shrubs 5 species <0.1% c. cover Gusa2 5% Ecco5 2% Chna 1%	Bare soil 40-60 Rock 0-10 Litter 10-20 Vegetation 20-40	
Existing Condition	Grasses 15 species Bogr 61% Plja 47% Elelb2 1% Spcr 7% Muto 23% Ardi5 0.5% Pasm 0.5	Forbs 4 species Arfr4 4% Peam 3% Rata 0.5	Shrubs 4 species Gusa2 15% Ecco5 2% Chna 2%	Bare soil 60 Rock 0 Litter 13 Vegetation 27	
Desired Plant Community	The site would be similar of what is described in the Potential Natural Community with noted exceptions. The blue grama community would increase by 10% to better reflect current conditions. Other grama species would increase in frequency as described in above. Under adaptive management, conservative use levels, and favorable climatic conditions, resource conditions would substantially move toward the desired conditions as described within the next ten years.				
Objectives	Achieve the Desired Plant Community for Tetilla #2 within 10 years and maintain a community similarity index that demonstrates a high similarity to desired index. Bare ground would be maintained at 60%, rock at 1%, and litter at 13% and vegetation at 26%. Forage production would be maintained between 500 and 1,000 lbs/acre however annual fluctuations in precipitation would need to be taken into account.				
Ecological Status	Potential Community Similarity Index = 34%. This equates to a mid similar to early seral stage as compared to the potential as described for TES unit 500. Desired Community Similarity Index = 68%. This equates to a high similar to late seral stage as compared to the desired plant community.				

## Plant List for the Caja del Rio grazing allotment.

<u>Symbol</u>	<u>Scientific Name</u>	<u>Common Name</u>	<u>Growth Habit</u>
AGSC5	<a href="#">Agrostis scabra Willd.</a>	rough bentgrass	Grass
ARDI5	<a href="#">Aristida divaricata Humb. &amp; Bonpl. ex Willd.</a>	poverty threeawn	Grass
ARDR	<a href="#">Arabis drummondii A. Gray</a>	Drummond's rockcress	Forb
ARFR4	<a href="#">Artemisia frigida Willd.</a>	prairie sagewort	Forb
ARTR2	<a href="#">Artemisia tridentata Nutt.</a>	big sagebrush	Shrub
BOCU	<a href="#">Bouteloua curtipendula (Michx.) Torr.</a>	sideoats grama	Grass
BOER	<a href="#">Boerhavia erecta L.</a>	erect spiderling	Forb
BOGR2	<a href="#">Bouteloua gracilis (Willd. ex Kunth) Lag. ex Griffiths</a>	blue grama	Grass
CEMO2	<a href="#">Cercocarpus montanus Raf.</a>	alderleaf mountain mahogany	Tree/Shrub
CHNA	<a href="#">Chrysothamnus nauseosus</a> (Pall. ex Pursh) Britton ssp. <a href="#">arenarius</a> L.C. Anderson		Shrub
ECCO5	<a href="#">Echinocereus coccineus Engelm.</a>	scarlet hedgehog cactus	Forb
ELELB2	<a href="#">Elymus elymoides (Raf.) Swezey ssp. brevifolius (J.G. Sm.) Barkworth</a>	squirreltail	Grass
GUSA2	<a href="#">Gutierrezia sarothrae (Pursh) Britton &amp; Rusby</a>	broom snakeweed	Forb/Shrub
HATE	<a href="#">Haplopappus tenuisectus</a> (Greene) S.F. Blake		
HYRI	<a href="#">Hymenoxys richardsonii (Hook.) Cockerell</a>	pingue rubberweed	Forb
HYRI	<a href="#">Hymenoxys richardsonii (Hook.) Cockerell</a>	pingue rubberweed	Forb
JUMO	<a href="#">Juniperus monosperma (Engelm.) Sarg.</a>	oneseed juniper	Tree/Shrub
LYPA	<a href="#">Lycium pallidum Miers</a>	pale desert-thorn	Forb
MUTO2	<a href="#">Muhlenbergia torreyi (Kunth) Hitchc. ex Bush</a>	ring muhly	Grass
OPPO	<a href="#">Opuntia polyacantha Haw.</a>	plains pricklypear	Forb
PASM	<a href="#">Pascopyrum smithii (Rydb.) A. Löve</a>	western wheatgrass	Grass
PEAM	<a href="#">Penstemon ambiguus Torr.</a>	gilia beardtongue	Forb
PIED	<a href="#">Pinus edulis Engelm.</a>	twoneedle pinyon	Tree/Shrub
PLJA	<a href="#">Pleuraphis jamesii Torr.</a>	James' galleta	Grass
PLPA2	<a href="#">Plantago patagonica Jacq.</a>	woolly plantain	Forb
POOL	<a href="#">Portulaca oleracea L.</a>	little hogweed	Forb
RATA	<a href="#">Ratibida tagetes (James) Barnhart</a>	green prairie coneflower	Forb
SIHY	<a href="#">Sitanion hystrix</a> (Nutt.) J.G. Sm.		
SPCO	<a href="#">Sphaeralcea coccinea (Nutt.) Rydb.</a>	scarlet globemallow	Forb
SPCR	<a href="#">Sporobolus cryptandrus</a> (Torr.) A. Gray	sand dropseed	Grass
TACO	<a href="#">Talinum confertiflorum</a> Greene		

Source: USDA Natural Resources Conservation Service Plants Database, <http://plants.usda.gov/>

## APPENDIX C – RESPONSES TO PUBLIC CONCERNS

On December 19, 2008, The *Proposed Action, Alternatives, and Preliminary Effects Analysis for the Caja del Rio grazing allotment* was made available for the 30 day notice and comment period. The proposed action was mailed to sixteen interested parties and grazing permittees. A legal notice was published in the *Albuquerque Journal* on December 26, 2008 notifying the public on the start on the comment and notice period. The District received three responses during the formal 30-Day comment period. The comments were coded, grouped and analyzed by the interdisciplinary team and district ranger. No new alternatives or significant issues were identified during the 30-day comment period. The following are responses to the public concerns identified by the interdisciplinary team.

---

**Public Concern:** *The FS should continue to allow livestock grazing in Santa Fe Canyon (Santa Fe River) and by doing so would but the water to beneficial use and show that the area has not been abandoned.*

**Response:** Information in the Environmental Assessment has been change to correctly identify the allotment boundary which includes portions of the Santa Fe River on the south end of the allotment. The Santa Fe River will be available for livestock water and to grazing under conservative grazing use principles.

---

**Public Concern:** *The previous preventive maintenance schedule of the wells be funded cooperatively with the FS and be made part of the Proposed Action.*

**Response:** It is the desire of the Forest to work cooperatively with CDRMCA to ensure that critical infrastructure is functioning correctly. Generally cost share can be provided on new projects or reconstruction of existing projects, however maintenance of existing facilities are generally assigned and are the responsibility of the individual permittees and or of the Grazing Association as identified under the Terms and Conditions of the Term Grazing Permit.

---

**Public Concern:** *The FS needs to explain how it measures forage production and calculates AUMs.*

**Response:** Forage production is measured by estimating pounds of available forage per acre. Production estimates are based on current year's production and not accumulated forage. Estimates are calibrated by clipping and weighing forage in a fixed plot and by extrapolating this to an acre of landscape which is within the same range type from which the forage was measured. A number of clipped plots are recommended to provide better representation of a particular range site and to calibrate sight estimation. Forage production can fluctuate significantly from year to year since production is dependent on a number of factors which include but not limited to; amount of annual precipitation, timing of precipitation events, overall vigor of forage plants, and growing season length.

Animal Unit (AU) is “considered to be one mature cow of approximately 1000 lbs, either dry or with calf up to six months of age, or their equivalent, based on a standardized amount of forage consumed” (Society of Range Management).

Head Month (HM) as defined in FSM 2230, WO Amendment 2200-2005-8 is a follows: For grazing fee purposes, a head month (HM) is a month's use and occupancy of rangeland by one weaned or adult cow, bull steer, heifer, horse, burro or mule, or 5 sheep or 5 goats. Head months are used only for grazing fee calculation and billing purposes.

Animal Unit Month (AUM) is a measure of the amount of forage required by a 1000 lb cow (either dry or with calf up to six months of age) or its equivalent for one month based on a daily allowance of 26 lbs. of dry matter (DM) intake per day (Society for Range Management 1998, USFS 1997). This is equivalent to 2.6% body weight.

The amount of forage consumed varies based on the size and class of livestock consuming the forage. In general, forage consumption increases with increasing size of the animal using the forage. A cow/calf pair will typically

consume more forage than a yearling which will consume less. Thus an area of rangeland with the capacity to support a certain number of mature cows will likely support relatively more yearlings over the (or other smaller animals) over the same period.

The Forest Service (Southwestern Region) uses conversions factors as guidelines for converting from cow/calf to various sizes of yearlings when necessary to do so based on requests from permittees to make such changes in annually permitted livestock. These conversion factors can be found in FSM 2230, R-3 Supplement 2200-91-1, page 7 of 14.

Under National Direction (FSH 2209.15 – Range Management Annual Reports Handbook WO Amendment 2209.15-91-1), the Forest Service uses AU-Factors for national statistical reporting purposes (e.g. mature cow – 1.00, mature cow w/nursing calf – 1.32, and yearling (9-18 months = .7). These AU-Factors are used for national statistical reporting purposes only and have nothing to do with allotment level grazing capacity estimates.

---

**Public Concern:** *OHV use has trampled specific areas around structural range improvements.*

**Response:** The EA acknowledges problems associated with heavy OHV use around certain range facilities. These issues however are out of the scope of the project to continue to permit livestock grazing on the allotment. Currently other Forest planning efforts are currently underway to address OHV impacts.

---

**Public Concern:** *The FS needs to consider the customer and culture and the economic well being of New Mexico's ranching community.*

**Response:** It is Forest Service policy to contribute 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). In addition, the Santa Fe National Forest Plan states that the Forest is to "manage Forest activities and programs within the capability of the land while recognizing the value of maintaining the traditional cultures of northern New Mexico" (Forest Plan p. 22). By proposing the authorization of livestock grazing on the allotments, the Española Ranger District recognizes and supports the traditional cultures of northern New Mexico.

---