



United States
Department of
Agriculture

Forest Service



Santa Fe
National Forest,
Region 3

September 2008

ENVIRONMENTAL ASSESSMENT

GRASS MOUNTAIN GRAZING ALLOTMENT

Project Number: 25900
Pecos/Las Vegas Ranger District
Santa Fe National Forest
San Miguel 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

PECOS/LAS VEGAS RANGER DISTRICT

SAN MIGUEL COUNTY, NEW MEXICO

GRASS MOUNTAIN GRAZING ALLOTMENT

ENVIRONMENTAL ASSESSMENT

Responsible Official:

Steve Romero, District Ranger
Pecos/Las Vegas Ranger District
P.O. Drawer 429
Pecos, NM 87552

For Information Contact:

Brian Davidson, Interdisciplinary Team Leader
1475 Rodeo Road
P.O. Box 1689
Santa Fe, NM 87505
Phone: (505) 438-7834

Table of Contents

CHAPTER 1 PURPOSE AND NEED FOR ACTION	1
INTRODUCTION	1
PURPOSE AND NEED FOR THE PROPOSED ACTION	1
THE PROPOSED ACTION	2
LOCATION, SETTING AND BACKGROUND	2
DESIRED CONDITIONS	2
PUBLIC INVOLVEMENT	4
CHAPTER 2 – ALTERNATIVES CONSIDERED	8
FORMULATION OF ALTERNATIVES	8
DESCRIPTIONS OF ALTERNATIVES CONSIDERED IN DETAIL	8
MITIGATION MEASURES	9
MONITORING	11
EFFECTS SUMMARY	12
CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS	15
INTRODUCTION	15
BACKGROUND	15
GRAZING MANAGEMENT	17
SOILS AND WATERSHED	18
AIR QUALITY	23
VEGETATION	23
THREATENED, ENDANGERED, AND SENSITIVE SPECIES	26
MIGRATORY BIRDS	39
MANAGEMENT INDICATOR SPECIES (MIS)	41
FISHERIES	45
RECREATION	45
CULTURAL RESOURCES	48
ENVIRONMENTAL JUSTICE AND SOCIAL ECONOMICS	48
CHAPTER 4 – CONSULTATION AND COORDINATION	49
APPENDIX A - REFERENCES CITES	50
APPENDIX B – TEU POTENTIAL AND DESIRED CONDITIONS	53

List of Tables and Figures

TABLE 1 FOREST PLAN MANAGEMENT AREA DESCRIPTIONS	3
TABLE 2 EFFECT SUMMARY BY ALTERNATIVE	12
TABLE 3 ALLOTMENT USE AND FACILITIES	17
TABLE 4 GRAZING INTENSITY GUIDELINES	17
TABLE 5 GRASS MOUNTAIN FORAGE CAPACITY ESTIMATES	24
TABLE 6 REGIONAL FORESTER'S SENSITIVE SPECIES LIST 2007	27
TABLE 7 CUMULATIVE EFFECT ON THREATENED, ENDANGERED AND SENSITIVE SPECIES	38
TABLE 8 CUMULATIVE EFFECTS ON SENSITIVE SPECIES	39
TABLE 9 HIGH PRIORITY MIGRATORY BIRDS	39
TABLE 10 CUMULATIVE EFFECTS ON MIS	44
TABLE 11 RECREATIONAL ACTIVITIES ON THE ALLOTMENT	46

CHAPTER 1 PURPOSE AND NEED FOR ACTION

INTRODUCTION

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (40 CFR, Parts 1500 - 1508) 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 Pecos/Las Vegas Ranger District 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, 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 Grass Mountain 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 NFS lands within the Grass Mountain 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:

- o Improve grazing management by construction 0.8 mile of new fence.

THE PROPOSED ACTION

The Pecos/Las Vegas Ranger District, Santa Fe National Forest proposes to continue to permit 18 horses from June 1st to October 15th under a ten year term grazing permit and construct 0.8 miles of new fence. 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 Grass Mountain Allotment comprises approximately 3,535 acres of National Forest System lands located in T. 18 & 19 N., R. 12 & 13 E, San Miguel County, New Mexico and is approximately 14 air miles north of Pecos, New Mexico (refer to map). Approximately 100 acres within the allotment is in private ownership. The allotment is administered by the Pecos/Las Vegas Ranger District. The Forest Plan identifies the allotment as being in Management Areas D (Recreation –Timber/Visuals) and H (Wilderness). The northern portion of the allotment falls within the Pecos Wilderness.

There is currently one ten year term grazing permit issued on the allotment for 18 horses annually from June 1st to October 15th. The grazing system is a rotational system. The allotment has two separate pastures. Eight spring developments facilitate livestock watering. The majority of the grazing occurs on an old historic golf course. The number of horses on the allotment varies throughout the authorized grazing season. The horses are used for day rides and pack trips into the Pecos Wilderness.

The allotment is located in the South Central Highlands Section of the Steppe - Open Woodland - Coniferous Forest - Alpine Meadow Province of the Southern Rock Mountain Ecoregion. The landscape has steeply sloping, sharp-crested mountains dissected by many narrow stream valleys; high plateaus with steep-walled canyons are common. Soils formed about equally in areas of volcanic ash flows, lavas, sandstones, siltstones, shales, and carbonates (McNabb et al 2007). Vegetative community types consist largely of mixed conifer (45%), Ponderosa pine (21%), Aspen (13%) and open grasslands (9%).

The allotment is divided by the Rio Mora-Pecos River and Rio Mora Watersheds (HUC 13600010203 & 130600010202). The Mora River forms the eastern boundary of the allotment. The Pecos River is immediately to the west of the allotment.

DESIRED CONDITIONS

An interdisciplinary team (IDT) of Forest Service resource specialists 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.

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.

In 2007, species composition, canopy cover and frequency data was collected on several areas within the allotment. This information is used to compare current vegetation against the Potential Natural Communities (PNC) for each TES map unit. PNC is the potential of a plant community as described in TES. It defines the range of variability for each TES map unit. PNC is used as a yardstick from which to determine the ecological status of existing vegetation, and as a baseline to establish the desired conditions for a landscape and/or allotment (Range Analysis and Management Guide 1997). The desired condition should represent full range of variation (seral stages) and biodiversity necessary for a sustainable ecosystem.

Role of the Forest Plan

The 1987 Santa Fe Forest Plan, as amended (Forest Plan) 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 1987 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-wide Goals related to this project:

- Emphasize high quality range forage (Forest Plan, p. 19);
- Have the permitted use be in balance with its capacity (Forest Plan, p. 19);
- Maintain [riparian] areas that are currently in good condition (Forest Plan, p. 20);
- 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); and
- Protect the productivity and diversity of riparian-dependent resources (Forest Plan, p. 79).

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 66 – 68 of the Forest Plan. Additional Standards and Guidelines are also applied to specific Management Areas.

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 Grass Mountain Allotment is located in the following Management Areas:

Table 1 Forest Plan Management Area Descriptions

Management Area	Acres	Emphasis
MA D (Recreation – Visuals/Timber)	2,539	Emphasis is on enhancement of visual quality and developed recreation opportunity. Grazing and timber activities occur where consistent with the primary emphasis of this area.

MA H (Wilderness)	1,096	Management emphasis in these areas is to preserve wilderness character and values. They will be managed to retain their “primeval wild character and influence, without permanent improvements or habitation and protected ... to preserve [their] natural conditions.” Primitive recreation opportunities, wildlife habitat management, grazing, and fire management will occur only when consistent with these values and where historically established.
-------------------	-------	---

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 IDT identified the desired resource conditions based on the PNC as described in TES. The desired conditions for the Grass Mountain Allotment are listed below. A description of the PNC, existing conditions, and desired conditions for each full capacity TES unit can be found in Appendix B.

- Full capacity range sites will be within its range of natural variability, exhibit the biodiversity necessary for a sustainable ecosystem, and be in fully functioning range condition.
- Maintain or move herbaceous species composition and surface components, such as litter and basal vegetative percentages toward PNC site potential.
- Forage species composition should exhibit a suite of species that are appropriate for the site based on the PNC description.
- Satisfactory range conditions with a mid to high similarity to PNC in an upward or static trend.
- Improve horse distribution and follow rotation schedule to minimize overuse in certain areas.
- Utilization of forage species does not exceed 40%.
- Control or eliminate non-native and invasive plant populations within the allotment.

PUBLIC INVOLVEMENT

This project was initiated on November 19, 2007. Scoping letters were sent to 42 interested parties and adjacent land owners on March 17, 2008 to invite comment on the proposed action. The District received two responses to the scoping letter. Comments received were reviewed by the District Ranger and the IDT. District representative met with the permittee several times throughout 2007 – 2008 to identify issues, develop, and refine proposed management actions on the allotment (PR 7). The proposal has been listed on the Forest’s Schedule of Proposed Actions since May 2008.

On August 22, 2008, The *Proposed Action, Alternatives, and Preliminary Effects Analysis* was made available for the 30 day notice and comment period. The proposed action was mailed to five interested parties and grazing permittees. A legal notice was published in the Albuquerque Journal on August 22, 2008 notifying the public on the start on the comment and notice period. The District received two responses during the formal 30-Day comment period. Comments were received from the US Fish and Wildlife Service and the Navajo Nation. The US Fish and Wildlife Service submitted the same comments during scoping which expressed to the Forest that requirements of the Endangered Species Act, Clean Water Act and the Migratory Bird Treaty Act are completed.

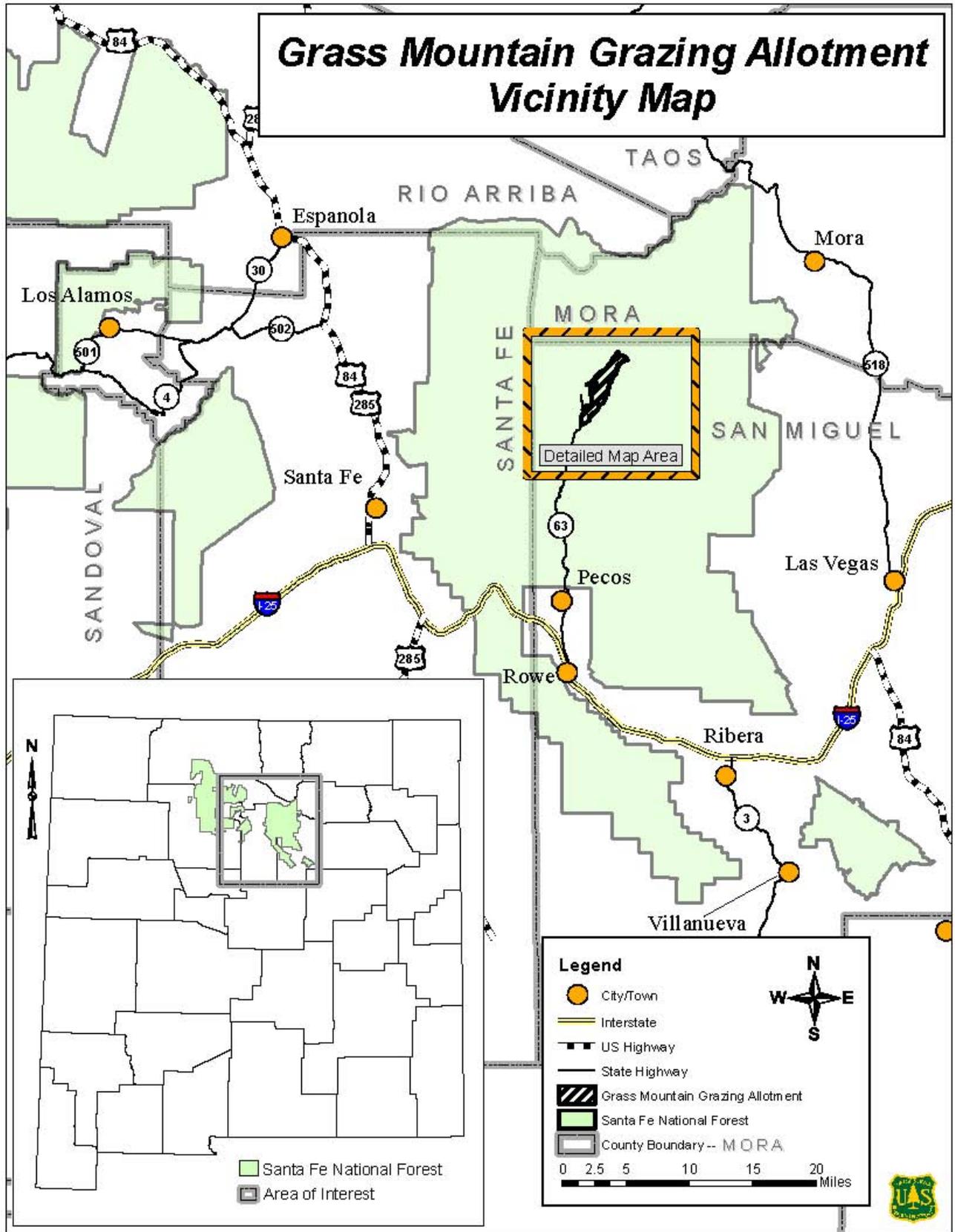
The Navajo Nation commented that they concurred that the proposal will not impact any Navajo traditional cultural properties. No new alternatives or significant issues were identified during the 30-day comment period.

DECISION FRAMEWORK

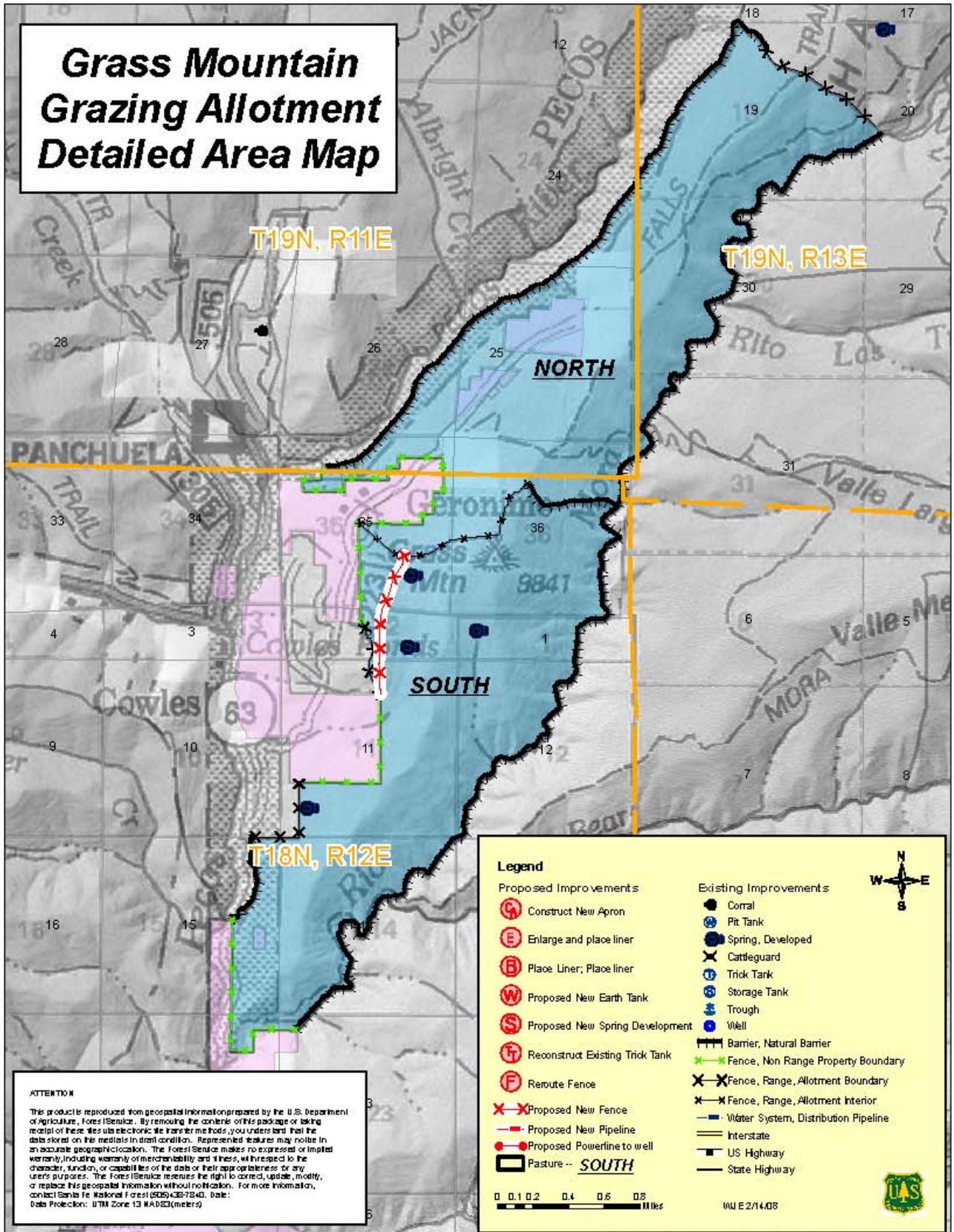
The District Ranger of the Pecos/Las Vegas Ranger District is the responsible official for selecting an alternative for the Grass Mountain Grazing Allotment. Based on the environmental analysis, Forest Plan direction, and results of public involvement, the Deciding Official must decide whether to proceed with a specific action. If an action alternative is selected, the decision will include application of mitigation measures in addition to the Forest Plan Standard and Guidelines.

There is a two-part decision to be made for authorizing livestock grazing.

1. Whether grazing should be authorized on all, part, or none of the allotment.
2. If the decision is to authorize some level of 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 toward those objectives occurs in an acceptable timeframe.



M



CHAPTER 2 – ALTERNATIVES CONSIDERED

FORMULATION 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 IDT. 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.

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 four components: Permitted Livestock, Range Facilities, Adaptive Management, and Monitoring. The proposed action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decisionmaking).

The Pecos/Las Vegas Ranger District, Santa Fe National Forest proposes to continue to authorize livestock (horses) grazing on the Grass Mountain Grazing Allotment under the following terms:

Permitted Livestock: The number of horses “permitted to graze” would be authorized up to 18 horses from June 1st to October 15th (107 AUMs¹). This is the number of AUMs that can be supported during times of favorable climate and resource conditions. The exact number of AUMs “authorized to graze”² on an annual basis would depend upon such things as the ecological condition of the allotment, available water, and forage, functional structural facilities, range readiness, and predicted forage production for the year. A utilization guideline of conservative use (40% 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.

Range Facilities: In consultation with the grazing permittee’s, 0.8 mile of new fence has been identified (Refer to Map) that will improve management of grazing horses on the allotment.

Adaptive Management: The Proposed Action is adaptive, allowing the Forest Service and the permittee to adjust the timing, intensity, frequency and duration of grazing; the grazing management system, and horse numbers according to resource conditions. The exact number of AUM’s authorized to graze on an annual basis would depend upon such things as the ecological condition of the allotment, available water, and forage production, condition of structural facilities, range readiness, and predicted forage production for the year. Anything less than the full permitted number of horses represents a condition in which capable acres and other integral components of the range management (such as water) are producing less than normal.

Monitoring: 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 an open, cooperative, and inclusive process with the permittee’s. Implementation and effectiveness monitoring are critical to determining when or if adaptive management changes should be made and to guide the direction that those changes take.

If monitoring indicates that desired conditions are not being achieved, management would be modified in consultation with the permittee. Adjustments to the annual authorized horse numbers (an increase or decrease) may occur during the grazing year, based on conditions and/or range inspections. An example of a situation that could call for adaptive management adjustments is drought conditions. If adjustments are needed, they are implemented through the AOIs. This proposal meets the Forestwide standards and guidelines as well as those specific to the Management Areas in the Forest Plan. Monitoring protocols would follow the Interagency Monitoring Technical References (FSM 2206).

MITIGATION MEASURES

To mitigate resource impacts from the proposed action, the following measures will be implemented. The mitigation measures included here are required and limited to those for which the Forest Service has authority. These mitigation measures have been used on previous projects and are considered to be effective in reducing environmental impacts. With full implementation of applicable Forest Plan standards and guidelines, project design criteria, and all prescribed mitigation measures, no potentially significant adverse environmental impacts would be expected to occur.

Soil, Water and Vegetation – the objective is to mitigate soil, water, and vegetation impacts from horse grazing and range facility construction-

¹ An AUM is the amount of oven-dry forage required by one animal unit for a standardized period of 30 animal unit days. An animal unit is considered one mature cow approximately 1,000 pounds, either dry or with calf up to six months of age, or their equivalent. The average value for animal month is 780 pounds of oven dry forage.

² Permitted livestock indicates the permitted 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.

- Horses will not be moved onto the allotment or allotment pastures until range readiness and facility inspections indicate that appropriate conditions exist;
- Key herbaceous riparian vegetation will have a minimum stubble height of 4-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 horses 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). 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. Residual plant material will not be reduced below those levels. Horses will be moved when utilization of key forage species in key use areas approaches established standards.
- Salt will be placed in locations to minimize impacts to riparian areas, meadow ecosystems, and other forest resources. 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 horse grazing and from disturbance associated with the location and construction of range facilities.

- Construction and maintenance of range facilities will be accomplished to have no adverse effect on Threatened and Endangered species (USDA-FS 1996, pg 68). If any listed or proposed T&E or Forest Service 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.
- Allotment fences will meet wildlife standards that allow easy migration and passage. All fences will 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 horse and wildlife use (USDA-FS 1996, pg 66). New and reconstructed water developments will include wildlife access, cover, and escape considerations (USDA-FS 1996, pg 67).
- Cattleguards will 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 ground disturbing activities associated with the construction of range facilities.

- Range structures will be located so as to avoid concentrating horses 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.
- 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 a program of 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 time periods, 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 and management objectives 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 may also affect grazing patterns.

If deemed necessary, key area locations may be modified. Reconsideration of key area locations identified by the Forest Service and permittees and 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.

EFFECTS SUMMARY

This section compares the effects of implementing each alternative relative to key issues and associated tradeoffs in meeting purpose and need. Information is quantified where possible; otherwise a brief qualitative description is included. This section includes criteria that may be important to the decision, but are not necessarily issues around which alternatives are generated. Information in this matrix relative to tradeoffs in meeting purpose and need is supported by information contained in the description of the proposed action and alternatives.

Table 2 Effect Summary by Alternative

Attribute/Resource	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
Meets Laws, Regulations, Policy and the Purpose and Need for the Proposed Action.	Does not authorize grazing, but achieves Forest Plan resource objectives. Complies with Rescission Act.	Meets the requirements of MUSY, NFMA, PRIA, FLMA and is consistent with the 1987 Santa Fe National Forest Plan. Authorizes grazing on suitable lands, balances use with capacity, and achieves Forest Plan objectives (FSM 2203.1; 36 CFR 222.2). Complies with Rescission Act. Provides for adaptive management to respond to changing conditions or to meet management objectives.
Effects on Soil and Watershed	There would be little change in riparian condition along the Rio Mora (4.9 mi) and Pecos River (3 mi) since the permitted horses can not access these areas due to terrain anyway. Soils are currently in satisfactory condition and would remain so without permitting 18 horses. Soil productivity and vegetative cover would improve slightly on full capacity range site and currently disturbed areas around spring developments.	There would be little change in riparian condition along the Rio Mora and Pecos River since the permitted horses can not access these areas due to terrain. Soils are currently in satisfactory condition and would remain so with light to conservative use of herbaceous forage. Soil loss would be minimal and below soil loss tolerances (< 2.71 t/ac/yr) on full capacity range sites.
Effects on Air Quality	No Effect	No Effect

Attribute/Resource	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
Effects on Vegetation	The effects of not permitting 18 horses on the allotment would not result in significant increases in species composition, productivity, or plant vigor. There would be an increase in the amount of Arizona fescue, mountain muhly and timber oatgrass in disturbed areas in full capacity range sites. Vegetative conditions are 90% similar to the site potential.	Vegetative condition will remain at 90 % of the potential natural community. Under light to conservative use levels, full capacity range sites will continue to show improvement in
Effects on Threaten, Endangered Species and Sensitive Wildlife Species.	No impacts on federally listed species of sensitive species know to occur or has habitat within the allotment.	Grazing 18 horses from June 1 st to October 31 st would have "no effect" on the Mexican spotted owl.
Effects on Migratory Birds	No Effect	No effect on high priority migratory birds or their habitat.
Effects on MIS	No Effect. Current trends for Rocky Mountain Elk, Merriam’s Turkey and Hairy Woodpecker.	Permitting 18 horses under a term grazing permit would not result in population or habitat changes for Rocky Mountain Elk, Merriam’s Turkey or Hairy Woodpecker.
Effects on Fisheries	No Effect	No Effect to Rio Grande Cutthroat Trout in occupied reaches on the Pecos or Rio Mora river either upstream or down stream of the allotment.
Effects on Wilderness and Recreation	The authorizations of 18 horses on the Grass Mountain allotment would not have a measurable effect on wilderness attributes or dispersed recreation.	The authorizations of 18 horses on the Grass Mountain allotment would not have a measurable effect on wilderness attributes or dispersed recreation.

Attribute/Resource	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
Effects on Heritage	No Effect	One site was located and that is currently impacted by permitted grazing. Grazing does not appear to be adversely affecting those qualities of the site that may make it eligible for inclusion in the National Register of Historic Places. Disturbance to cultural resource sites related to livestock grazing on the allotment is not significant.
Effects on Social-Economics	No Effect. No impacts to low income or minority populations.	Permitting 18 horses under a term grazing permit would not result in adverse impacts to environmental resources or socioeconomic conditions. No impacts to low income or minority populations.

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 Combined Data Systems, Geographical Information Systems (GIS), Natural Resource Information System, Forest Inventory, and Analysis Database, Infrastructures Database 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, including to a lesser extent the short-grass steppe region of eastern New Mexico. 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 from the Rio Grand Valley. 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).

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 surveying NFS lands and adjudicating individual permits to conform to range capacity in 1910. Through out the early part of the 20th century, the Forest Service began addressing 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 Grass Mountain Allotment has historically been used as part of a two pasture rotation grazing system with the Links Tract pasture on the Rosilla Allotment. The permittee currently grazing on the Grass Mountain Allotment also has a permit on the Rosilla Allotment enabling the two pasture rotational system between both allotments. In the 1970's the permit was converted from a 90 head cow/calf permit to a 20 head horse permit. In the late 1970's it was converted back into a cow/calf permit. In 1994, the permit was converted to 18 horse permit. The horses that are permitted on the Grass Mountain Allotment are used as part as an outfitter and guide service, as well as part of a riding stable and tour business. Horses are continually being rotated on and off the allotment as they are used on day rides and pack trips into the Pecos Wilderness. Rarely will the entire permitted head occupy the allotment concurrently.

GRAZING MANAGEMENT

The allotment encompasses approximately 3,636 acres, of which about 98 acres are privately owned. Of the approximate 3,538 acres on National Forest System lands, about 14% (483 acres) are considered “capable” range. The existing grazing permit authorizes 18 horses to graze. The current grazing strategy on the allotment is deferred rotation that uses natural barriers, herding, salting, and existing developments to manage livestock. The table below summarizes the use and facilities located on the Grass Mountain Allotment.

Table 3 Allotment Use and Facilities

Grass Mountain Allotment	
Allotment Acres	3,636
NFS Lands	3,538
Number of Permits	1
Season of Use	6/1 to 10/15 (4.5 months)
Number of Livestock	18 Horses
Animal Use Months (AUM)	137
Grazing System	Two pasture deferred rotation
Range Facilities	
Spring Developments (each)	4
Fences (miles)	2.2

Based on the inspections and the monitoring conducted, less than one percent or acres of the total grazed acres on the allotment are in “unsatisfactory range management status.” This term describes the situation where the existing vegetation is not desired and where short-term objectives are not being achieved.

Rangeland is considered to be in “satisfactory range management status” when the existing vegetation is similar to the desired condition or the short-term objectives are being achieved to move the rangeland toward the desired condition. The existing condition of the allotment is described below.

In unsatisfactory areas, increasing densities of species such as cinquefoil and Kentucky bluegrass are gradually displacing desired species such as fescue and timber oatgrass. Uneven distribution of livestock contributes to lower vigor and composition of desired plants. Livestock can not fully utilize the entire capable range due to a poor fence (electric) on the west side of the allotment. Because the current infrastructure is not adequate and the livestock end up outside of the allotment, the permittee can not fully implement a deferred rotation grazing strategy. Over time, the lack of fully implementing a grazing strategy could cause a shift towards less desirable plant communities, such as cinquefoil and Kentucky bluegrass.

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 Grass Mountain allotment are Arizona fescue, Mountain muhly, Timber oatgrass, Kentucky bluegrass, and Western wheat. Grazing intensity guidelines developed by Holecheck and Galt (2000) for mountain grasslands range types are followed:

Table 4 Grazing intensity guidelines

Grazing intensity guide for mountain grasslands in New Mexico (Holechek & Galt, 6/00, Rangelands).						
Qualitative Grazing Intensity Category	Use of Forage by Percentage (%)	Stubble Height Indicators of Grazing Intensity				
		Arizona Fescue	Western Wheatgrass	Bluegrass	Mountain Muhly	Timber Oatgrass
----- Average height of vegetation (inches)-----						
Light to non-use	0-30	8.0+	7.0+	5.5+	5.0+	8.0+
Conservative	31-40	6.0-7.0	4.0-5.0	4.0-5.0	4.0-5.0	6.0-7.0

SOILS AND WATERSHED

AFFECTED ENVIRONMENT

SOILS

Landscape and Geology: The Grass Mountain grazing allotment is situated adjacent to other “wilderness” allotments of the Santa Fe National Forest at the southern end of the Sangre de Cristo Mountains. This high-elevation range trends north-northeasterly in north central New Mexico, and includes the second highest peak, South Truchas Peak, at an elevation of 13,102 feet. The mountains are formed of a complex core of metamorphosed Precambrian granite, partially overlain by Paleozoic seafloor sediments and Cenozoic volcanic and fluvial deposits. At least four major periods of structural deformation has contributed to the landscape seen today. The Sangre de Cristos mountain chain parallels the Rio Grande, which flows from north to south through the rift basin depression to the west (Miller et al, pgs 1-9, 1963).

This allotment has a southern aspect, and climbs from an elevation of 8,000 feet to 9,600 ft, with a wide range of slope steepness, between 20-120%. The area sustains between 16 and 24 inches of precipitation per year (National Weather Service), chiefly in a bi-modal distribution of winter snow and summer thunderstorm delivery. At the upper elevations, soils are derived from the Precambrian Embudo Granite. Most soils are derived from outcrops of Paleozoic limestone.

The ecosystem is defined as a low-sun/cold environment in the lower allotment elevations and high-sun/cold in the higher elevations. This distinction indicates the time of year of greatest precipitation, and that here, snowfall dominates at the mountaintops (Terrestrial Ecosystem Survey (TES), Santa Fe National Forest, pg 3, 1993).

Dominant vegetation ranges from deciduous at the lower elevations (riparian areas) to mixed conifer, and to spruce-fir and aspen higher up. Perennial streams flank the allotment, and these are bordered by riparian vegetation.

Soil Condition: Soil condition is primarily determined by evaluating surface soil properties. This is the critical area where plant and animal organic matter accumulate, begin to decompose 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 soil condition 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 (FSH 25 09 R3 SUPPLEMENT).

On the Grass Mountain allotment, all NFS acres are considered to be in satisfactory soil condition, which means that indicators signify that soil function is being sustained and soil is functioning properly and normally and that the soils ability to maintain resource values and sustain outputs is high.

RIPARIAN, WETLANDS, STREAMS, WATER QUALITY

This allotment is located within the headwaters of Cow Creek-Pecos River (1306000102) Fifth Code Watersheds. The allotment acres within the watershed are approximately 3,535 acres. Flow data and other flow information can be found at the US Geological Survey National Water Information System Website <http://waterdata.usgs.gov/nwis>

Riparian and Wetlands: Riparian areas are basic to the hydrologic function of watersheds. Ground cover promotes infiltration and conserves water, soil, and nutrients on-site. Influent soil moisture recharges ground

water and base flows. Trees and shrubs regulate floods by dissipating flow energies, control water temperature by shading streams, improve channel structure by adding debris, and supply food to aquatic fauna. Watershed conditions upstream affect riparian areas by influencing the size, frequency, duration, and water quality of floods and base flows.

Dominant riparian vegetation on this allotment includes, willow, wheatgrass, plantain, alder, acacia and yarrow (Riparian GIS query, formulated by Wayne Robbie, pers. communication, 2003). The analysis of existing streams is based on GIS analysis and on information gathered in the field by ocular assessment and Proper Functioning Condition riparian survey protocol that describes riparian diversity and basic stream morphology. Not all mapped reaches or delineations were field validated.

Streams and Floodplains: All of the named drainages within this analysis area are considered perennial. The Grass Mountain allotment is bound by the Rio Mora (4.9 miles) on the east and the Pecos River (3 miles) on the west. The perennial streams originate from the upper elevations of this allotment and generally flow northeast to southwest. Continuous baseflow and flood flows sustain riparian vegetation here, except during periods of extreme drought, when available groundwater flow is tapped.

Floodplains are minimal along the reaches of the steeper gradient streams (Rosgen A channel-type), but they are present and functional where the channel flattens they flow in Rosgen “B” channels. There is little or no grazing within the floodplains because of a lack of access due to steep terrain.

Water Quality: Water quality has been assessed within the analysis area and no impairment exists in the Rio Mora. Where trails cross the river, there is temporary turbidation. Grazing by the horses does not contribute to pollution load on the Grass Mountain allotment, according to the Forest Service ocular monitoring and according to the SWQB. It is neither a historical nor a current problem.

Evaluation Criteria: 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. Soil loss was modeled for unsatisfactory and/or impaired soils where they intersect with likely horses use areas.

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 (Elliot 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, 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.

Riparian conditions were analyzed with an ocular assessment of stream stability. Riparian areas were also field-evaluated with the “Proper Functioning Condition” protocol (USDOI BLM, USDA NRCS, USDA FS, TR 1737-15, 1998) on some allotments. Proper Functioning Condition (PFC) is defined as:

“Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality, filtering sediment, capturing bedload, and aiding floodplain development, and improving flood-water retention and ground-water recharge.” It is not, however, a measure of fish habitat quality.

DIRECT AND INDIRECT EFFECTS ON SOILS AND WATERSHED

Impact to soils and watershed (rangeland hydrology) vary from allotment to allotment depending on the type of livestock, 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 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).

The impacts of grazing on riparian areas, fish habitat and water quality are of particular concern in the southwest. Heavy grazing on riparian areas causes soil compaction, loss of vegetation and increased sedimentation. This can indirectly result in widening of stream channels, warmer water temperatures, increases in turbidity, and increases in nutrients and bacteria (Meehan 1991). Livestock grazing on public lands can also be a source of non-point pollution. While sediment is the major source of pollution from grazing activities, bacterial coliform levels are also a concern. This is not just isolated to the lands being grazed, but extends to areas downstream outside of the grazing allotments.

Grazing can also be beneficial to watersheds if managed at a light to conservative use level, as on the Grass Mountain allotment. The key to maintaining healthy 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 horse 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 (Elliot 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 Action (No Grazing): This alternative would likely result in the most beneficial effect to the soils and hydrology resources. Soil condition and hydrologic improvement or recovery would likely occur over many decades.

Streams having a departure from their Rosgen classification type could evolve to their historical stream-type and channel dimensions, although those in the Grass Mountain Allotment are not highly departed from their historical condition. Under a no-grazing alternative, stronger and deeper roots could filter more sediment and support bank-building processes at some locations. This would result in decreased channel width-to-depth ratios, or narrower and deeper streams, and it would increase streambank stability and sinuosity. Scour-resistant woody root systems expand and invigorate, and help to withstand flood-level runoff events. Less sediment is delivered under these conditions. Proper riparian function already exists on the Grass Mountain allotment.

Soils in this allotment are already in satisfactory condition. Even with no horse grazing, wildlife would continue to forage and vegetative conditions would remain functional as they are at this time. Density of ground cover and species diversity of upland, riparian, and wetland native perennials could increase over several decades under this alternative. Existing willow populations would remain and be represented in all age classes. A big factor that serves as natural protection of the streams on the Grass Mountain Allotment is that access is limited due to the steepness of the terrain. Horses cannot readily the stream channels.

Alternative 2 – Proposed Action: Much of the discussion above is also true for the Proposed Action alternative. The difference is that the current trend would continue, and any improvement would take even longer than the no-grazing alternative. The proposed installation of 0.8 miles of new fence would facilitate better horse distribution and allow for improved vegetative species diversity in that portion of the allotment.

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). The WEPP predicted soil loss and sedimentation due to livestock grazing on TEU units 251 and 213 would be approximately 1.8 tons per acre per year. The soil loss tolerance for these TEU units ranges from 2.71 to 3.64 tons per acre per year.

Horse concentration is low where the forest is dense, because shading inhibits growth of grasses and other forage species. Areas accessible to grazing are in the upland meadows (38% of the allotment). Vegetative composition and percent ground cover in the meadow key use area(s) has been monitored at 90% of the desired potential natural community.

On this allotment, the direction of change caused by livestock grazing is stable. Use is unlikely in most riparian areas and heavily-timbered portions. Observations show no signs of trampling or pedestalling. Thus, it is assumed that streams maintain good water quality, and soil loss due to horse utilization is estimated to be below the tolerance level of 2.7 and 3.6 tons per acre, respectively.

A stable trend is occurring. With the current permitted numbers and adaptive management (control of timing, duration and frequency) based on monitoring of resource conditions, it is expected that current range condition would continue 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 the current conditions will continue is as long as horses are permitted to graze.

Horse use is regulated through herding, water availability, and salt placement. Best Management Practices for horses grazing limit turbidity in the surface water by limiting their access. As discussed above, this occurs by controlling timing or by distribution. In the Grass Mountain allotment, turbidity from erosion or sedimentation specifically due to utilization by horses was not identified.

The Proposed Action is designed to implement properly managed grazing by the addition of a fence, and thus reduce adverse effects to the ecological conditions of the analysis area.

CUMULATIVE EFFECTS ON SOILS AND WATERSHED

The geographic area considered for cumulative effects is a portion of the Cow Creek-Pecos River 5th-code watershed (HUC 1306000102). The allotment also bisects two 6th code HUCs: Rio Mora and Rio Mora-Pecos River, and therefore drains to both. The area of influence from the grazing of up to 18 horses is within the headwaters of the larger watershed, mainly a portion of the Rio Mora to its confluence with the Pecos River and along a portion of the upper Pecos River above that confluence. This area is selected because it represents the extent in which permitted stock and other Forest Service activities result in modification of vegetation and soil properties that would impact the area downstream. Three adjacent grazing allotments, Horse Thief, Bear Lakes, and Valle Medio also potentially contribute effects to this area.

Ownership within the Grass Mountain allotment is under Forest Service management (3,535 acres), adjacent to 846 acres of private land. Much of the downstream Pecos River corridor is under private and state ownership. Onsite current and historical activity includes dispersed recreation and grazing utilization by horses. No wild fire, prescribed fire, or timber harvesting is documented in this area. Horse utilization is modest, and monitoring indicates impacts are principally to high mountain meadows in the allotment. Overstory vegetation in the forested areas includes Englemann Spruce, Aspen, and Douglas Fir. The cover provides sufficient shade to inhibit the productivity of forage species. Wooded areas on south and west aspects support oak woodland and Ponderosa Pine. In the meadows, forage species include Mountain brome, Arizona fescue, and prairie Junegrass.

Approximately 8 miles of perennial streams border the allotment, including 2.7 miles of the Pecos and 5 miles of Rio Mora. Water quality impairment does not occur due to horse grazing or other uses in this area, nor for several miles of Pecos immediately downstream, according to The New Mexico Environmental Department (<http://www.nmenv.state.nm.us/swqb/303d-305b>). Riparian species include willow, sedges, yarrow, and bluegrass. Slight stock use is evident on a short segment of the upper Pecos; however, most of the terrain to flowing water is steep and inaccessible by large animals. Spring developments receive disproportionate use, and the surrounding soils receive some compaction from horses and wildlife. Nevertheless, in this allotment, 100 percent of the soil is considered to be in satisfactory condition. Soil texture is loam and sandy loam and provides appropriate moisture and nutrient function. Inherent productivity is maintained. Light to conservative grazing on NFS lands along with BMPs (Best Management Practices) and adaptive management strategies would not contribute to impairment of the Pecos River in this effects area.

In conclusion, the activities proposed in this project would not incrementally add to the effects of past present and foreseeable activities. At this time there are no other Forest Service activities planned. Adherence to standard and guidelines, best management practices and mitigation measures will minimize any detrimental effects to long term soil productivity or water quality. State and private land accounts for approximately 76 percent of the cumulative effects area and likely will account for the majority of impacts to watershed resources.

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 Grass Mountain Allotment is within a Class I 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 South Central Highlands Section of the Steppe - Open Woodland - Coniferous Forest - Alpine Meadow Province of the Southern Rock Mountain Ecoregion. The allotment ranges in elevation between 8,000 and 9,600 feet in the Sangre de Cristo Mountain range. The landscape has steeply sloping, sharp-crested mountains dissected by many narrow stream valleys; high plateaus with steep-walled canyons are common. Soils formed about equally in areas of volcanic ash flows, lavas, sandstones, siltstones, shales, and carbonates (McNabb et al 2007). Vegetative community types consist largely of mixed conifer (45%), Ponderosa pine (21%), Aspen (13%) and open grasslands (9%). Vegetation types is largely defined by elevation, with higher elevations exhibiting a spruce-fir forest, middle elevations having a mixed conifer forest, and lower elevations trending towards a ponderosa pine forest. Aspen stands are found along north facing slopes, and in cool drainages; canyon bottoms support a variety of riparian vegetation.

The Santa Fe National Forest Terrestrial Ecosystem Survey (TES) provides a critical link for inventorying rangeland vegetation. The TES maps units provide the basic information for natural resource planning, management and monitoring. Each TES map unit is provided with a narrative description of the potential natural community. TES map units are also used to determine which lands will contribute to the forage base for livestock grazing based on the capability of each TES unit.

Grazing capability is a qualitative expression of the inherent ability of an ecosystem to support grazing use by various classes of livestock on a sustained yield basis; that is, maintaining the stability and productivity of the site. Soil stability determinations and site productivity evaluations are used in combination to determine and assign one of three capability classes:

Full capability - are those areas that can be used by grazing animals under proper management without long-term damage to the soil resource or plant communities. Full capability areas exhibiting fair, good, or excellent range condition, are considered stable or improving (upward trend), and are designated as satisfactory. Full capability areas exhibiting poor range condition are considered to be on a downward trend and are designated as unsatisfactory.

Potential capability – are those areas that could be used by grazing animals under proper management but where soil stability is impaired, or range facilities are not adequate under existing conditions to obtain necessary grazing animal distribution. These areas are not included when calculating the amount of forage available for cattle.

No capability – are those areas that cannot be used by grazing animals without long-term damage to the soil resource or plant community, or are barren or unproductive naturally. These areas are not included

when calculating the amount of forage available for cattle and a designation of satisfactory or unsatisfactory is not applicable.

Capable areas comprise about 14 % of the allotment. The table below displays acres of capable and non-capable range sites on the allotment. Of the capable areas, about 482 acres (99%) are considered satisfactory and less than one acre (>1%) unsatisfactory. Elements of the proposed action (particularly construction of new fence) were developed to address the unsatisfactory range by providing better distribution of livestock. Current permitted forage needs is approximately 73,000 lbs of forage for the eighteen horses for four and half months. Depending on spring and summer precipitation and site productivity, estimated available forage ranges between 111,243 lbs to 194,856 lbs on full capacity range sites.

Table 5 Grass Mountain Forage Capacity Estimates

Pasture	TEU Soil #	Acres	Fully Capable Acres	Non Capable Acres	Total Forage High (lbs)	Total Forage Low (lbs)	Available Forage High (lbs)	Available Forage Low (lbs)	AU High	Au Low
North	6	21	0	21	41,689	27,098	0	0	0	0
North	212	203	63	140	80,289	52,188	23,716	15,416	30	20
North	213	632	195	437	340,684	221,444	77,026	50,067	99	64
North	221	223	0	223	5,563	3,616	0	0	0	0
North	228	444	0	444	22,178	14,416	0	0	0	0
North	236	13	0	13	949	617	0	0	0	0
North	251	13	13	0	15,824	10,285	4,431	2,880	6	4
North	252	57	0	57	4,266	2,773	0	0	0	0
North	353	170	0	170	8,489	5,518	0	0	0	0
North Pasture		1774	270	1504	519,931	337,955	105,173	68,363	135	88
South	6	10	0	10	10,479	6,811	0	0	0	0
South	213	255	72	183	112,996	73,447	23,953	156	31	31
South	221	413	0	413	10,330	6,715	0	0	0	0
South	228	773	0	773	191,567	124,519	0	0	0	0
South	251	141	141	0	234,749	152,587	65,730	42,724	84	84
South	252	88	0	88	6,612	4,298	0	0	0	0
South	353	84	0	84	4,197	2,728	0	0	0	0
South Pasture		1,764	212.46	1551.6	570,930	371,105	89,683	42,880	115	75
Allotment Totals		3,537	482.51	3055.12	1,090,861	709,060	194,856	111,243	250	162

DIRECT AND INDIRECT EFFECTS ON VEGETATION

No Grazing (Alternative 1): When the term grazing permit expires, livestock would be removed from the allotment. No new permits would be issued. All range facilities would revert to the Forest Service and be evaluated for their value as protection to soil, wildlife, and watersheds. Allotment boundary fences would not be removed as they would be needed to prevent unauthorized use from cattle on neighboring areas.

Herbaceous understory or open meadows would not be grazed by horses, but would continue to be grazed by deer and elk. In areas where biodiversity and plant densities that are similar to the site potential there would be little improvement in the current condition.

The direct effects of removing 18 horses on ponderosa, aspen, and meadows would not result in significant increases in species composition, productivity or the plant vigor in this allotment as a whole. It would be expected that there would be slight increases in the amount of Arizona fescue, Mountain muhly and timber oatgrass

especially in disturbed area. Several studies (see Milchunas 2006 and Lauenroth et al 1994) have shown that light to no grazing would results increase cover, species composition, and increase in root biomass.

Proposed Action (Alternative 2): The proposed action would permit 18 horses from June 1st to October 15. Annual authorized use would be based on resource conditions. If drought conditions exist and forage production is below potential, then adjustments in the amount of authorized livestock would be made.

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 eighteen permitted horses primarily graze in the open grassland, ponderosa, and aspen communities. The horses favor the open grassland for the most part. Little to no grazing occurs in the mix conifer or oak woodlands due to a lack of herbaceous understory because of dense canopy closure in the overstory. Utilization is light to moderate within key areas. Monitoring of utilization in 2003 – 2007 in key areas indicated that stubble heights were within light to conservative grazing intensities for Arizona fescue, timber oatgrass, and Kentucky bluegrass. Continuation of current grazing management under conservative use levels and adaptive management would continue to move full capacity range sites toward the appropriate site

Implementation of the 0.8 miles of fence would improve range conditions by constructing a pasture fence to improve distribution of horses throughout the allotment.

CUMULATIVE EFFECTS ON VEGETATION

The area considered for cumulative effects are the two 6th code hydrological units (Rio Mora-Pecos River and Rio Mora). The majority of the Grass Mountain allotment is contained by these two watersheds. This cumulative effects area was selected because the 6th code watersheds 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. This area covers approximately 71,508 acres (112 square miles) 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 18 horses on the Grass Mountain allotment.

The cumulative effects area contains four other grazing allotments (Bear Lake, Macho, Rosilla and Valle Medio). A total 2,492 AUMs (505 C/c and 18 horses) are grazed within the cumulative effects area including the Grass Mountain allotment. Grazing on these allotments occurs for 4 ½ months during the summer season. Within the cumulative effects area there are approximately 9,086 acres of “full capacity” range sites allocated to grazing and approximately 57,403 acres of “no capacity” range. Monitoring on these 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 18 horses over the next ten years under conservative use guidelines and adaptive management on the Grass Mountain allotment would not incrementally add to the effects of permitted grazing on these other allotments.

In 2002, the 5,800 acre Trampas fire occurred. Approximately 3,339 acres of this fire occurred within the cumulative effects area. This fire was a high intensity, stand replacing fire. The majority of Engleman spruce, and Douglas fir stands have been type converted to aspen stands with dense herbaceous understory. The immediate effects of this fire have dissipated, however, long –term successional stages will continue. The effects of this fire are not expected to add to the incremental effects of the proposed action.

Some individual landowners graze horses and cattle on private land, mainly in open areas adjacent to the Pecos River. The extent of grazing on the 772 acres of private land is limited due to a lack of open pasture lands along the Pecos River corridor. The effects of grazing on private land would not incremental add to the effects of permitted grazing on the Grass Mountain allotment.

No other federal activities (timber harvests, thinning, and prescribed fire) have occurred in the past ten years that would have a cause and effect relationship to the proposed actions. There are currently no known foreseeable federal actions involving vegetative management within the cumulative effects area.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

AFFECTED ENVIRONMENT

Federally Listed Species

Six species and one critical habitat area were excluded from further analysis for the following reasons:

- Holy Ghost Ipomopsis (*Ipomopsis sancti-spiritus*)-Endangered- Suitable habitat for this species does not exist in the project area.
- Southwestern willow flycatcher (*Empidonax traillii extimus*), Endangered - Suitable habitat for this species does not exist in the project area.
- Black-footed ferret (*Mustela nigripes*), Endangered - The black-footed ferret has been extirpated from the project area without feasibility for reintroduction.
- Rio Grande silvery minnow (*Hybognathus amarus*), Endangered - Suitable habitat for this species does not exist in the project area.
- Arkansas River Shiner (*Notropis girardi*), Threatened - Suitable habitat for this species does not exist in the project area.
- Mexican Spotted Owl (MSO)-(*Strix occidentalis lucida*)-Threatened- Suitable habitat for this species does not exist in the project area. There are no mature, large diameter trees that would provide adequate nesting habitat for the MSO. Mixed conifer habitat is small diameter and lacks good habitat for nesting and roosting.
- Mexican Spotted Owl Critical Habitat- Suitable critical habitat for this species does not exist in the project area.

Suitable habitat for the MSO is usually defined by a multi-layered, moderately closed or closed canopy comprised of mixed conifer, and hardwood trees and shrubs. Large trees, 12 inches in diameter or greater that are mid-aged and older, or of late-successional stage make up the bulk of the stand, which also has standing dead trees, shrubs, and downed logs. Spruce fir, pure aspen and piñon-juniper habitats are rarely used by the MSO.

The Forest Plan specifies three levels of MSO habitat management: protected areas, restricted areas, and other forest and woodland types (Forest Plan, Appendix D, p. 1.). Restricted habitat can be described as (USFWS 1995):

Areas having at least 25% mixed conifer habitat and riparian areas (perennial streams) outside of protected areas

- At least 20 trees per acre averaging 18 dbh

- Stand density index by size class- 10 % of trees must be at least 12-18”
- Stand density index by size class-10 % of trees must be at least 18-24”
- Stand density index by size class-10 % of trees must be at least 24” +

The total acreage of mixed conifer habitat is approximately 1,527 acres (42 % of allotment) for the entire project area. There are no MSO PACs located on the allotment yet MSO potential habitat is present.

Potential habitat on the allotment consists of slopes ranging from 10-30%, dense patches of small diameter (< 12” dbh) white fir, Douglas fir, and ponderosa pine ranging from 2-30 acres. Within these patches are very few dead and down logs as well as few very small (< 10” dbh) snags. Multi-layers of vegetation are not prevalent within the dense patches of small diameter trees. Also, within the patches there are few to no large diameter trees, the closed canopies make it difficult for large trees to develop. There are steep slopes along the cliff/rock faces that lead down to the Pecos and Mora rivers that could provide nesting ledges but canyon habitat is rarely used in this part of the owls range. The rest of the allotment consists of wide open spaces with lots of shrubs and large diameter aspens and other species of mixed conifer interspersed along or within meadows. There are some small amounts of dead and down logs within aspen stands and large aspen snags also adjacent to meadows. There is 4.5 miles of stream, 31 acres of riparian areas along the Pecos and Mora rivers.

Regardless of the fact that MSO have not been detected on the allotment, horse grazing and management activities would be managed for levels that provides the woody and herbaceous vegetation necessary for cover for rodent prey species. The residual biomass would support prescribed natural and ignited fires that would reduce the risk of catastrophic wildfire in the forest, and regeneration of riparian trees. Key areas in the allotments would be monitored in the fall to ensure proper levels of woody and herbaceous vegetation are maintained for prey species.

MSO inventories took place throughout the district in mixed conifer habitat in the early 1990’s, which included the areas around the Grass Mountain allotment having the best MSO habitat potential (Lujan pers. Comm.). Surveys on this allotment yielded no detection of MSO. The surveyed areas on the allotment do not contain quality nesting/roosting habitat as compared to areas with established PACs outside the allotment. There are no large contiguous dense patches of mixed conifer which is considered nesting habitat.

The Grass mountain allotment is in good condition. Horse grazing is light in most places and is considered to be conservative grazing. Horses do not graze on steep slopes/steep canyons which is considered fair quality MSO nest/roost/foraging habitat. Although MSO are not known to occur on the allotment, grazing levels are conservative and horses will need to leave the allotment at their exit date or when grass/forage utilization has reached conservative grazing levels (31%-40% utilization).

Forest Service Sensitive Species

The following table displays sensitive 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 6 Regional Forester's Sensitive Species List 2007

Common Name	Occurrence on Grass Mountain allotment	Habitat on Grass Mountain allotment	Comments/Habitat description
Northern Goshawk	Yes	Yes	Northern goshwks have been detected within the Grass Mountain allotment. See discussion below.
Boreal owl	Unknown	Yes	Spruce-fir forest. See discussion below.

American Bald Eagle	Unknown	Yes	Bald eagles have not been detected on the allotment, yet their habitat is present along the Pecos and Mora Rivers. See discussion below.
Pale Townsend's big-eared bat	Unknown	Yes	Xeric to mesic habitats, including desert scrub, deciduous and coniferous forests (including spruce-fir, mixed conifer, and oak woodlands). See discussion below.
Western heather vole	Unknown	Yes	Occurs at high elevations in the Sangre de Cristo mountains. They occupy stands of spruce-fir, aspen, grassy meadows in montane forests, subalpine forests and alpine tundra. Eats grasses and forbs. See discussion below.
Long tailed vole	Unknown	Yes	Occurs in high elevation mixed forest on sheltered slopes and in riparian spruce, willow and alder communities. Usually associated with meadows and forest edge. See discussion below.
Masked shrew	Unknown	Yes	Confined primarily to riparian habitats in subalpine coniferous forest in the Sangre de Cristo, Jemez and San Juan Mountains, usually above 9,500'. See discussion below.
Water shrew	Unknown	Yes	Water shrews are confined to the Sangre de Cristo, San Juan and Jemez Mountains. They occur near permanent streams, seldom descending below 8,000' in altitude. See discussion below.
Dwarf shrew	Unknown	Yes	This shrew lives in white fir-Douglas fir zone from about 7,000' to 9,000'. Preferred habitats are rocky areas primarily in subalpine coniferous forest. See discussion below.
Ermine	Unknown	Yes	Habitat includes forest-edge, grassland, shrub, wet meadows, and riparian areas. See discussion below.
Mink	Unknown	Yes	Obligate riparian animals, never found far from permanent streams, wetlands, or other surface water. See discussion below.
Northern leopard frog	Unknown	Yes	Riparian areas such as slow moving streams, marshy areas, wet meadows. See discussion above.
Sensitive Plant Species			
Greater yellow lady's-slipper	Unknown	Yes	Grows in boggy areas, swamps, damp woods (decaying leaf litter), and near rivers/streams. Also associated with rocky wooded hillsides on north or east facing slopes in spruce-fir habitats (Kershaw et al 1998, NatureServe 2007).
Wood Lily	Unknown	Yes	Occurs in the understory of mixed-conifer forests out of direct sunlight. Wooded sites in foothills in montane-subalpine habitats (Kershaw et al 1998). Also occurs in facultative wetlands in the southwest (USDA NRCS 2007).
Pecos mariposa lily	Unknown	Yes	Habitat consists of meadows and aspen glades in upper montane coniferous forest; 9,500-11,200 ft.

Northern Goshawk: The goshawk is a forest habitat generalist, utilizing a variety of forest types, forest ages, structural conditions and successional stages. The principal forest types occupied by the goshawk are ponderosa pine, mixed-species and spruce fir (Reynolds et al. 1992). Nesting habitat consists of older age forests with variable tree species. The most consistent vegetation characteristic of goshawk nest sites is a high percent of canopy closure. Goshawk prey (forest birds and mammals) occupy ground-shrub, shrub-canopy, and canopy layers.

The mature, medium age and young trees in the analysis area provide nesting and post-fledgling areas. The analysis area also provides good foraging habitat. Vegetation structural stages (VSS) defined by the Management Recommendations for the Northern Goshawk (USDA 1992) throughout the analysis area would be considered; VSS 1-areas dominated by grasses, forbs, and shrubs; VSS 3, and VSS 4-mid-aged forest.

Goshawks have been detected on allotment in a 1991 survey. Goshawks were detected. No Goshawks were detected during a 2007 survey. The ponderosa pine canopy within some areas on the allotment is open and allows for sufficient grasses to grow. There are many large ponderosa pine trees that provide nesting habitat and plucking posts. There are also many large aspens, perennial water (Mora and Pecos Rivers) and a few natural springs (except in a drought year) on the allotment that provide water and good nesting habitat for the goshawk (Lujan, pers. Comm., Nelson, field visit). Foraging habitat is present where there are tall grasses within the ponderosa pine and aspen canopies.

Grazing does not occur along the Mora and Pecos Rivers due to steep slopes and rock features/talus slopes that make travel to the rivers extremely hazardous and difficult for large mammals.

Boreal Owl: The boreal owl occupies subalpine forests of true fir and Engelmann spruce. They are an obligate cavity nester, located in mature or older forests, sometimes in aspen cavities, sometimes in snags. They occupy cool microsites with higher canopy cover, higher basal area and greater tree density than random sites which produce uncrusted snow conditions in winter. They have been detected in Jack's Creek, Upper Santa Fe River, and the North Fork trail in the Pecos Wilderness (Stahlecker 1990).

Boreal owls have not been detected on the allotment yet spruce-fir habitat is present. Large trees ranging from 12 to 24-inches in diameter (dbh) and many large aspen and fir snags are present within the allotment which provide nesting habitat for the owl. There are few dead and down logs within portions of the allotment which provide habitat for prey species. Light grazing occurs throughout the allotment; conservative grazing levels were noted in fall 2007 toward the top of Grass Mountain (Nelson, field notes). Forage consumption is at low to conservative levels and would not greatly reduce boreal owl habitat.

American Bald Eagle: Bald eagle habitat consists of forested areas near large bodies of water. The forested areas along the Pecos and Mora Rivers are considered suitable habitat for the American bald eagle. No eagles have been sighted on this allotment.

Two to four individual bald eagles are known to winter in the Pecos River drainage. They roost in large snags and large live trees along the Pecos River. Bald eagles are winter residents and occasional nesters in New Mexico. The eagle requires fish-producing waters and large riparian trees to successfully nest and produce young. Bald eagles are usually found around streams as wide as or wider than the Pecos River. During the winter months they congregate in areas with high fish densities and waterfowl. Areas in New Mexico known to have wintering eagles are Navajo Lake, Heron Lake, and the Chama River Valley and Rio Grande Gorge, locations far removed from the allotment.

Horses on the Grass Mountain Allotment do not graze along the Pecos or Mora Rivers, which are considered bald eagle habitat, because the steep slopes and rocky outcrops make travel to the rivers hazardous and difficult for the horses. Additionally, bald eagles are only present in the winter, whereas the horses graze during the summer. Thus, there is no temporal overlap between the presence of bald eagles and horses.

Pale Townsend's Big-Eared Bat: The Pale Townsend's big-eared bat occurs in a variety of xeric to mesic habitats, including desert scrub, deciduous and coniferous forests (including spruce-fir, mixed conifer, and oak woodlands). They have shown preference for edge habitats between streams and mountain slopes. It is frequently associated with caves and abandoned mines for day roosts and hibernacula but will also use abandoned buildings and crevices on rock cliffs for refuge. They are known to glean insects from vegetation and to forage within tree

canopies (Perkins and Schommer 1992 and Nowak 1994). Bats are known to forage on some species of insects that occupy riparian vegetation (NMGF 2007).

Pale Townsend's big-eared bats have not been detected on the allotment yet their habitat (ponderosa pine coniferous forest, oak woodlands) is present. Perennial water is available in the Mora and Pecos Rivers and intermittent water is available through natural springs which provides habitat for various species of insects. Grazing does not occur along the Mora and Pecos Rivers for reasons previously stated.

Western Heather Vole: Heather voles occupy stands of spruce-fir, lodgepole pine, aspens, ponderosa pine, grassy meadows in montane forests, sub-alpine forests, and alpine tundra. In New Mexico, their elevation range is 7,000 ft. (Santa Fe) to 12,500 (Pecos Baldy). These voles are herbivores, foraging on grasses, forbs, leaves, pine needles, and flowers

This species occurs on the Santa Fe National Forest; specimens have been found in Mora (Pecos Baldy), Rio Arriba (11.5 mi. NE of Chama), and Santa Fe (16 mi. NE of Pojoaque) Counties. It also occurs in San Miguel County (NMGF 2007). The Western heather vole has not been detected on the allotment yet their habitat (spruce-fir, meadows) is present and there are grassy meadows and mountain tops with abundant forbs and shrubs, which provide seeds for the voles.

Light to conservative grazing occurs through out allotment. Since forage consumption on the allotment is considered to be at conservative levels (Nelson field notes), vole habitat would not be greatly reduced by horses grazing.

Long-tailed vole: This vole occurs in high elevation mixed conifer forests on sheltered slopes and in riparian spruce, willow and alder communities. This species is a good indicator of permanent water. They are most abundant where there is some grassy vegetation on the forest floor (NatureServe 2007). They are usually associated with meadow and forest edge habitats, and sometimes found living in the forest itself. It is most common in mixed conifer and spruce-fir forest. Because this species is largely dependent on well-developed mesic meadows, excessive grazing is considered a potential threat to habitat. General diet includes grasses, bark, fungi, seeds and berries.

The long-tailed vole has not been detected on the allotment yet their habitat is present along the Pecos and Mora Rivers and within meadows and forest edges. Horses do not graze along the Mora and Pecos Rivers. Light to conservative grazing occurs throughout the rest of the allotment but primarily in meadows and forest edges. Forage consumption on the allotment is, on average, at conservative levels, and would not greatly reduce vole habitat.

Cinereus (masked) shrew: In New Mexico, these shrews are confined primarily to riparian habitats in subalpine coniferous forest in the Sangre de Cristo, Jemez and San Juan Mountains, usually above 9,500 feet elevation. It has been found along the banks of cold streams, in springy meadows, or under logs in the cold spruce-fir forest.

The shrew has not been detected on the allotment yet their habitat is present along the Pecos and Mora Rivers. Horses do not graze along the Mora and Pecos Rivers. Light to conservative grazing occurs through out allotment. Although grazing occurs throughout the allotment, forage consumption on the allotment is on average is at conservative levels, and would not greatly reduce shrew habitat.

Water shrew: According to current records, in New Mexico water shrews are confined to the Sangre de Cristo, San Juan and Jemez Mountains. They occur near permanent streams, seldom descending below 8,000 feet elevation. The water shrew can swim with great facility, diving under water to pursue aquatic organisms and run across the surface of the water for a short distance (Findley 1987). They eat large quantities of invertebrates on a daily basis such as earthworms and spiders.

The water shrew has not been detected on the allotment yet their habitat is present along the Pecos and Mora Rivers. Horses do not graze along the Mora and Pecos Rivers. Light to conservative grazing occurs through out allotment). Although grazing occurs through out the allotment, forage consumption on the allotment is on average is at conservative level, and would not greatly reduce shrew habitat.

Dwarf shrew: This shrew lives in the white-fir/Douglas-fir zone from about 7,000' to 9,000'. The preferred habitat is talus and other rocky areas primarily in subalpine coniferous forest. Management practices in BISON note those dwarf shrews are tolerant of clearcutting and grazing (NMGF 2007). Some captures have been made at sites where there is no free water.

The dwarf shrew has not been detected on the allotment yet their habitat is present along the rocky/talus slopes above the Pecos and Mora Rivers. Horses do not graze along the Mora and Pecos Rivers. Light to conservative grazing occurs through out allotment Although grazing occurs through out the allotment, forage consumption on the allotment is on average is at conservative levels and would not greatly reduce shrew habitat.

Ermine: This weasel lives in mixed conifer at high altitudes (7,800' to 11,000') in northern New Mexico in association with small rodent populations in montane meadows. Habitats include forest-edge, grassland, shrub, wet meadows, and riparian areas. They feed on insects, mice, birds and eggs.

The ermine has not been detected on the allotment yet high elevation mixed conifer is present throughout the majority of the allotment. Light to conservative grazing occurs throughout allotment, forage consumption on the allotment is, on average, at conservative levels and would not greatly reduce ermine or its preys' habitat.

Mink: Mink are obligate riparian animals, never found far from permanent streams, wetlands, or other surface water. Den sites, such as abandoned beaver lodges and muskrat dens, are very important habitat features. Other habitat features include development of shoreline vegetation including willows and emergent vegetation (Marshall 1936), crayfish abundance, availability of logjams for fall and winter hunting sites, and abundance of muskrats. Reaches of stream where banks have been degraded by horses are avoided as are ephemeral and high gradient streams (Fitzgerald, Meaney, and Armstrong, 1994).

Mink are excellent swimmers and capable of catching fish, which make up a significant part of its diet. Other foods include insects, small mammals, birds, eggs, crayfish, and frogs. Records of occurrence include: Mora County (Watrous), Rio Arriba County, (Alcalde, Velarde), San Miguel County (Las Vegas), and Santa Fe County (above Santa Fe). Watershed occurrences include the Pecos and Canadian river drainages (Hubbard et al., 1979). Mink have not been detected on the allotment yet their habitat is present along the Pecos and Mora Rivers. Horses do not graze along the Mora and Pecos Rivers. Light to conservative grazing occurs throughout the allotment (but forage consumption is, on average, at conservative levels and would not greatly reduce mink habitat.

Northern leopard frog: The leopard frog ranges in a wide variety of habitats (springs, marshes, wet meadows, riparian areas, vegetated irrigation canals, streams, rivers, ponds, and reservoirs) but require a high degree of vegetative cover for concealment (NatureServe Explore 2002). In New Mexico they are found from about 3,600-10,000 feet elevation. They prefer quiet or slowly flowing waters and avoid areas without cover; they breed in ponds or lake edges with fairly, dense aquatic emergent vegetation from April-July and September-October (Degenhardt et al 1996). Juveniles and adults live in aquatic vegetation in ponds, and in adjacent grass, sedge, weeds or brush (Corkran and Thomas 1996). They occur in Rio Arriba, Sandoval, Santa Fe, Bernalillo, San Miguel and Mora Counties.

Leopard frogs have not been detected on the allotment yet their habitat is present along portions of the Pecos and Mora Rivers, and natural springs. Horses do not graze along the Mora and Pecos Rivers.. Low lying riparian vegetation is abundant and in good condition adjacent to the Mora and Pecos Rivers, yet the water is swift and not the best habitat for leopard frogs. Foraging habitat and cover is available adjacent to natural springs. Light to

conservative grazing occurs throughout allotment and forage consumption is, on average, at conservative levels, and would not greatly reduce leopard frog habitat.

Greater yellow lady’s slipper: *Cypripedium parviflorum* var. *pubescens* habitat has declined, and it is likely that populations have been impacted by collectors for the plant trade. It may be intolerant of degraded natural habitat and threatened by changes in hydrology, overabundance of ungulates, and invasive species (NatureServe 2007). Most occurrences of this species are small populations and in New Mexico, there are no reports of more than 14 individuals in a given occurrence (NM Natural Heritage 2007).

The lady’s slipper has not been detected on the allotment yet their habitat (riparian areas, wooded hillsides in spruce-fir) is present. Perennial and permanent water is present which would provide mesic habitat for the lady’s slipper.

Wood Lily: *Lilium philadelphicum* var. *andinum* (formerly *L. umbellatum*) is a widespread woodland species, ranging from Ohio to British Columbia and southward to Arkansas and New Mexico. The US distribution of this species includes; Colorado, Kentucky, Nebraska, South Dakota, Illinois, Michigan, New Mexico, Texas, Indiana, Minnesota, North Dakota, Wisconsin, Iowa, Montana, Ohio, Wyoming (NM Rare Plants 2007).

There are eleven New Mexican collections of wood lily at the University of New Mexico from San Miguel, Los Alamos, Sandoval, and Otero Counties. Martin & Hutchins also lists Rio Arriba and Santa Fe Counties as having wood lily (NM Rare Plants 2007). On the Pecos/Las Vegas Ranger District it has been found in the understory of mixed conifer forests (Lujan, pers. Comm.).

The wood lily has not been detected on the allotment yet their habitat (mixed conifer, shady understory) is present. Perennial water is present which would provide mesic habitat for the lilies.

Pecos Mariposa Lily: *Calochortus gunnisonii* is the only species of mariposa lily in the Sangre de Cristo Mountains. Habitat consists of meadows and aspen glades in upper montane coniferous forest; 9,500-11,200 feet elevation. The mariposa lily is very difficult to find. Attempts to relocate the historical population on Hermit’s Peak have been unsuccessful.

The wood lily has been found in southwestern Mora, northwestern San Miguel, and southwestern Colfax Counties in the southeastern part of the Sangre de Cristo Mountains. The mariposa lily has not been detected on the allotment yet their habitat (mixed conifer, aspens) is present. Nothing is known of this species’ response to horses grazing and forest fire.

DIRECT AND INDIRECT EFFECTS ON THREATENED, ENDANGERED AND SENSITIVE SPECIES

Federally Listed Species

Monitoring indicates that grazing utilization on the allotment has been light to moderate (in few places) by horses. Horses have difficulty maneuvering through the heavily forested areas and steep slopes on the allotment. Some areas have limited grasses/forbs due to high canopy cover.

Horse grazing occurs in areas that are not considered nesting/roosting habitat for MSO, such as large meadows, aspen groves, and forest edges. Field reconnaissance showed that current grazing occurs in the meadows and on moderate slopes (Lujan, pers. Comm., E. Nelson field notes).

The mixed conifer habitat does not meet the minimum criteria for restricted habitat based on the following: the allotment lacks contiguous patches of large diameter, closed canopies, mixed conifer forest. There are small patches of small diameter mixed conifers having few small diameter snags and small amounts of small diameter

dead and down trees. There are no trees 18-inches diameters (dbh) or larger totaling 20 trees or more per acre. High tree density is not well distributed across landscape. There are no snags 18” or above in the mixed conifer stands

Determination: Grazing 18 horses from June 1st to October 31st would have "no effect" on the Mexican spotted owl. This determination meets the criteria designated in the USDA guidance criteria (USDA 2005) and is based on the following:

- Mexican spotted owls are not present within the action area.
- In the allotment, no livestock grazing or livestock management activities would occur within protected and restricted habitats, as defined in the species’ recovery plan.
- Habitat is not currently suitable to meet nesting/roosting requirements for MSO.

Sensitive Species

Alternative 1- No Grazing

Northern Goshawk: Eliminating grazing would not affect individual goshawks because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of goshawk habitat because no reduction in tree density or canopy closure would occur. There would be an incremental increase in the amount of ground cover for prey because there would be no horses. These effects would result in a “no impact” determination.

Boreal Owl: Eliminating grazing would not affect individual boreal owls because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of owl habitat because no reduction in large tree/snag density or nest cavities would occur. There would be an incremental increase in the amount of ground cover for prey because there would be no horses on the allotment. These effects would result in a “no impact” determination.

American Bald Eagle: Eliminating grazing would not affect individual bald eagles because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of eagle habitat because no reduction in large tree or snag density would occur. Horses would not occupy the Pecos or Mora Rivers and associated riparian habitat which would not remove prey base habitat because horses would not be present on the allotment. These effects would result in a “no impact” determination.

Pale Townsend’s Big-Eared Bat: Eliminating grazing would not affect individual bats because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of bat habitat because no reduction in roosting or nesting habitat such as mines, caves, and rock outcrops would occur. There would be an incremental increase in the amount of ground cover for prey such as insects because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Western Heather Vole: Eliminating grazing would not affect individual voles because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of vole habitat because no reduction in grasses and forbs would occur. There would be an incremental increase in the amount of ground cover which would increase the amount of food (seeds, forbs, grasses) for the vole because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Long tailed vole: Eliminating grazing would not affect individual voles because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of vole habitat because no reduction in grasses and forbs would occur. There would be an incremental increase in the amount of ground cover which would increase the

amount of food (seeds, forbs, grasses) for the vole because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Cinereus (masked) shrew: Eliminating grazing would not affect individual shrews because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of shrew habitat because no reduction in grasses and forbs would occur. There would be an incremental increase in the amount of ground cover throughout the allotment and near natural springs which would increase the amount of food (seeds, forbs, grasses) for the shrew because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Water shrew: Eliminating grazing would not affect individual shrews because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of shrew habitat because no reduction in riparian habitat adjacent to permanent water would occur. There would be an incremental increase in the amount of ground cover near natural springs which would increase the amount of food (seeds, forbs, grasses) for the shrew because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Dwarf shrew: Eliminating grazing would not affect individual shrews because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of shrew habitat because no reduction in talus/rock slopes would occur. There would be an incremental increase in the amount of ground cover throughout the allotment which would increase the amount of food (seeds, forbs, grasses) for the shrew because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Ermine: Eliminating grazing would not affect individual ermines because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of ermine habitat because no reduction in forest edge, grasslands, shrubs and wet meadows would occur. There would be an incremental increase in the amount of ground cover throughout the allotment which would increase the amount of prey base habitat for the ermine because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Mink: Eliminating grazing would not affect individual minks because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of mink habitat because no reduction in riparian habitat adjacent to permanent water would occur. There would be an incremental increase in the amount of ground cover throughout the allotment which would increase the amount of prey base habitat for the mink because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Northern leopard frog: Eliminating grazing would not affect individual frogs because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of frog habitat because no reduction in riparian habitat adjacent to permanent water or natural springs would occur. There would be an incremental increase in the amount of ground cover near riparian areas which would increase the amount of prey base habitat for the frog because there would be no horses on the allotment. These effects would result in a “no impact” determination.

Greater yellow lady’s slipper: Eliminating grazing would not affect individual ladies slippers because the absence of horses would not disturb them. Alternative 1 would not reduce the amount of ladies’ slipper habitat because no reduction in riparian habitat or wooded hillsides would occur. There would not be alteration of water resources or soils because there would be no horses present. These effects would result in a “no impact” determination.

Wood Lily: Eliminating grazing would not affect individual wood lilies because the absence of horses would not disturb them. Alternative 1 would not reduce the amount wood lilies habitat because no reduction in riparian habitat or trees providing shade would occur. There would not be alteration of water resources or soils because there would be no horses present. These effects would result in a “no impact” determination.

Pecos Mariposa Lily: Eliminating grazing would not affect individual Mariposa lilies because the absence of horses would not disturb them. Alternative 1 would not reduce the amount Mariposa lilies habitat because no reduction in aspen or spruce fir trees providing shade would occur. There would not be no trampling of plants because there would be no horses present. These effects would result in a “no impact” determination.

Alternative 2 – Proposed Action

Northern Goshawk: Alternative 2 would not reduce the amount of goshawk habitat because no overall reduction in tree density or canopy closure would occur, although a few trees would be removed during fence construction. Because horses would be not be allowed more than 40% utilization, consumption of forage would be light to moderate and would not greatly reduce the habitat of prey species. Further, constructing a fence to improve distribution of horses would incrementally improve ground cover by forcing horses to graze more evenly across the allotment. An increase in ground cover would provide additional habitat and cover for the goshawk’s prey. Horses would remove grass where they graze, resulting in a very minimal decrease of prey base habitat from when horses leave the allotment until the following spring when the grass grows back. There would not be a complete lack of cover, because grasses and forbs continue to grow during the growing season and because horses would be removed when utilization standards were met. In addition, all 18 horses are rarely in the allotment at one time since they are used on a daily basis for trail rides. Therefore, re-authorizing grazing permits and building 0.8 mile of new fence may impact individual goshawks, but is not likely to result in a trend toward federal listing or loss of viability.

Boreal Owl: Grazing at conservative levels would not reduce the amount of owl nesting habitat because no reduction in large tree density or nest cavities would occur. Grazing at proposed levels would maintain forage used by the owl’s prey. Alternative 2 would not reduce the amount of owl habitat because no overall reduction in tree density or nesting cavities would occur, though a few trees would be removed during fence construction. Further, constructing fences to manage the movement of horses would incrementally improve ground cover of prey species by forcing the horses to graze more evenly across the allotment. Horses would remove grass where they graze, resulting in a very minimal decrease of prey base habitat from when cattle leave the allotment until the following spring when the grass grows back. There would not be a complete lack of cover, because grasses and forbs continue to grow during the growing season and because cattle would be removed when utilization standards were met. Therefore, re-authorizing grazing permits and building 0.8 mile of new fence may impact individual owls, but is not likely to result in a trend toward federal listing or loss of viability.

Pale Townsend’s Big-Eared Bat: Roost disturbance is the primary threat to this species. Horses grazing would not remove nesting or roosting habitat such as mines, caves and rock outcrops. Grazing on this allotment would not exceed 40% utilization and would not remove large quantities of riparian prey base habitat. This allotment is not conducive to grazing along perennial rivers; natural barriers limit grazing which would reduce insect habitat. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual bats, but is not likely to result in a trend toward federal listing or loss of viability because bat roosts would not be removed by horses grazing. In addition, conservative grazing would not greatly reduce habitat for insects.

Southern red-backed vole: Grazing rarely occurs on the steeper slopes/high elevation in the mesic forest where the vole occurs. Even though horses occupy the lower elevation ranges of this allotment, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of vole habitat. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual voles, but is not likely to result in a trend toward federal listing or loss of viability because horses rarely occupy steep slopes on the allotment. In addition, conservative grazing practices would not reduce habitat for the vole because horses occupy moderate terrain such as meadows on the allotment.

Western Heather Vole: Grazing occurs in primarily in the meadows and along forest edge on the allotment where the vole occurs. Even though horses graze where vole habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of vole habitat (range monitoring, PR#). Re-

authorizing grazing permits and building 0.8 mile of new fence may impact individual voles, but is not likely to result in a trend toward federal listing or loss of viability because the voles occupy a variety of habitats throughout the allotment, whereas horses occupy meadows and forest edge on the allotment. In addition, conservative grazing practices and construction of a fence to increase management of grazing would not greatly reduce habitat for the vole.

Long tailed vole: Grazing occurs in meadows and forest edges on the allotment where the vole occurs. Horses may remove grassy vegetation in meadows and forest edges that the vole uses for cover and foraging. Even though horses graze where vole habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of vole habitat. Rarely are all 18 horses present on the allotment at one time since they are used for trail rides and outfitting. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual voles, but is not likely to result in a trend toward federal listing or loss of viability because current condition reflects conservative grazing practices. In addition, the construction of new fence would assist in improved grazing management to increase horse distribution on the allotment. Even though horses graze within the riparian zones such as natural springs, conservative grazing practices would not greatly reduce habitat for the vole.

Cinereus (masked) shrew: Grazing does not occur along perennial water such as the Pecos and Mora Rivers where the masked shrew occurs. Horses may remove grassy vegetation along natural springs in spruce-fir habitat that the shrew uses for cover and foraging. Even though horses graze where some shrew habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of shrew habitat. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual shrews, but is not likely to result in a trend toward federal listing or loss of viability because the shrews occupy permanent riparian habitats and natural springs on the allotment, whereas horses occupy natural springs on occasion but in low numbers since they are used for trail rides on a daily basis. The construction of a new fence would help to manage horse distribution on the allotment to prevent excessive grazing. In addition, conservative grazing practices would not greatly reduce habitat for the vole.

Water shrew: Grazing does not occur along perennial water such as the Pecos and Mora Rivers where the water shrew occurs. Even though horses do not graze where shrew habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of shrew habitat (range monitoring, PR#). Re-authorizing grazing permits would not impact individual shrews because grazing does not occur in water shrew habitat due to natural barriers limiting horse occupancy along the Mora and Pecos Rivers.

Dwarf shrew: Grazing does not occur on the talus/rock slopes at higher elevation in the spruce-fir forest where the dwarf shrew occurs. Even though horses occupy the other portions of this allotment, grazing on this allotment would not exceed 40% utilization and would not remove shrew habitat. Re-authorizing grazing permits and building 0.8 mile of new fence would not impact the dwarf shrew because habitat such as rock ledges and talus slopes will not be removed by horses grazing. In addition, conservative grazing practices would not reduce foraging habitat on the steep slopes for the shrew.

American marten: Grazing occurs along forest edges and meadows on the allotment whereas the marten occurs where there is mature old-growth spruce-fir with high canopy cover, and abundant fallen logs. Horses may remove grasses and shrubs that the marten's prey uses for cover and foraging. Even though horses rarely graze where marten habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of the martens prey habitat. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual martens, but is not likely to result in a trend toward federal listing or loss of viability because the martens occupy habitats with high tree densities on the allotment that horses rarely occupy. The construction of a new fence would remove only a few incidental trees which would not remove habitat for the marten. In addition, conservative grazing practices would not greatly reduce habitat for the martens prey.

Ermine: Grazing occurs along forest edges and meadows on the allotment where the ermine occurs where there is forest-edge, grassland, shrub, wet meadows, and riparian areas. Horses may remove grasses and shrubs that the ermine's prey uses for cover and foraging. Even though horses graze where ermine habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of the ermine's habitat or its prey habitat. Rarely are all 18 horses present at the same time on the allotment because they are used for trail rides and outfitting on a daily basis. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual ermine, but is not likely to result in a trend toward federal listing or loss of viability because conservative grazing practices would not greatly reduce habitat for the ermine's prey. In addition, the construction of a new fence would help to increase the distribution of horses to minimize excessive grazing.

Mink: Grazing does not occur along perennial water such as the Pecos and Mora Rivers where mink habitat occurs. Even though horses do not graze where mink habitat is present, grazing on this allotment would not exceed 40% utilization and would not remove large quantities of mink habitat (range monitoring). Re-authorizing grazing permits and building 0.8 mile of new fence would not impact individual mink because grazing does not occur in mink shrew habitat due to natural barriers limiting horse occupancy along the Mora and Pecos Rivers.

Northern leopard frog: Leopard frogs have not been detected on the allotment, yet habitat is present along the natural springs. Tall grasses on the allotment and sedges, and carex spp along riparian areas provide hiding cover, and foraging areas for the frog. Grazing may occur within some frog hiding cover and foraging habitat and within riparian areas yet forage consumption is conservative and would remove a small portion of these habitats. Re-authorizing grazing permits would reduce a small amount of frog hiding cover and foraging habitat because horses would graze grass adjacent to riparian areas. Because horses would not be allowed more than 40% utilization, consumption of forage would be conservative and would not greatly reduce the frog's habitat. Horses would remove grass where they graze, resulting in a very minimal decrease in habitat from when horses leave the allotment until the following spring when the grass grows back. There would not be a complete lack of cover for the frog, because grasses and forbs (sedges) continue to grow during the growing season and because horses would be removed when utilization standards were met. Therefore, re-authorizing grazing permits and building 0.8 mile of new fence may impact individual frogs, but is not likely to result in a trend toward federal listing or loss of viability.

Greater yellow lady's slipper: Grazing occurs along forest edges, natural springs and meadows on the allotment. Lady's slippers occur on wooded hillsides in spruce-fir habitats, and riparian zones typically at higher elevation. Even though horses graze along natural springs grazing on this allotment would not exceed 40% utilization and would not remove canopy cover such as spruce-fir and mixed conifer habitat. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual lady's slippers, but is not likely to result in a trend toward federal listing or loss of viability because the plant occurs in spruce-fir habitats which are at high elevations on the allotment. Although conservative grazing practices would not remove the plant's habitat, trampling of individual plants may occur. New fence construction would remove few incidental trees but would help to improve horse distribution, eliminate excessive grazing, and reduce the chance of trampling plants.

Wood Lily: Grazing occurs along forest edges, meadows, and adjacent to natural springs. The proposed action would remove few incidental trees that provide understory habitat for the lily. Trampling by horses, especially in drainages with intermittent flow, would impact the wood lily by disturbing individual plants. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual wood lilies, but is not likely to result in a trend toward federal listing or loss of viability because the plant occurs in mixed conifer habitats that provide shade as well as riparian areas. Horses typically don't occupy shady areas in mixed conifer where grass is limited. Horses may occupy riparian areas which would allow for trampling of individual plants. Since conservative grazing practices are in place, some trampling of the plants may occur but not enough to greatly reduce plant populations.

Pecos Mariposa Lily: Grazing occurs along forest edges, meadows, and adjacent to natural springs. The proposed action would remove few incidental trees that provide understory habitat for the lily. Trampling by

horses, especially in drainages with intermittent flow, would impact the Mariposa lily by disturbing individual plants. Re-authorizing grazing permits and building 0.8 mile of new fence may impact individual Mariposa lilies, but is not likely to result in a trend toward federal listing or loss of viability because the plant occurs in mixed conifer and aspen habitats that provide shade as well as riparian areas. Horses typically don't occupy shady areas in mixed conifer or aspen where grass is limited. Horses may occupy riparian areas which would allow for trampling of individual plants. Since conservative grazing practices are in place, some trampling of the plants may occur but not enough to greatly reduce plant populations. New fence construction would help to improve horse distribution, minimize excessive grazing and reduce the chance of trampling of plants.

CUMULATIVE EFFECTS ON THREATENED, ENDANGERED AND SENSITIVE SPECIES

The proposed action would cause a depletion of moderate amounts of vegetation while cattle are grazing in these areas, and for a month or two afterwards until the vegetation has time to grow back. As such, there would be cumulative effects; however, the cumulative effects would not exceed the utilization standards set forth. The cumulative effects would apply to the following species' habitats because they occur or have nesting, foraging, or prey base habitat in grasses or riparian areas: northern goshawk, boreal owl, bald eagle, Townsends big eared bat, red backed vole, western vole, long tailed vole, masked shrew, water shrew, dwarf shrew, ermine, mink, northern leopard frog, yellow lady's slipper, wood lily, Pecos mariposa lily, Merriam's turkey, Rocky Mountain elk, Rocky, hairy woodpecker and migratory birds.

The temporal boundary of this analysis is from 15 years ago to the projects listed on the Santa Fe National Forest's Schedule of Proposed Actions or other projects in official planning status. The reason for the temporal boundary is that riparian areas such as natural springs in the allotments tend to recover on an annual basis, so cumulative effects are relatively short-lived and going back 15 years would capture changes. The geographical area is the boundary of the allotment for the cumulative effects to nesting, foraging, and prey base habitat is the boundary of the allotment which encompass over 16,364 acres, because this is a sufficient contiguous area in which birds and animals can roam to other habitat. The follow table displays the cumulative effects of other actions occurring on NFS lands to the decrease in foraging, nesting, or prey base habitat that may be caused by grazing horses on the Grass Mountain Allotment.

Table 7 Cumulative effect on Threatened, Endangered and Sensitive Species

Action(s)	Date of Action	Size of area	Effect of Action	Cumulative Effect (all actions)
Fuel wood harvest	On-going	~200 acres	Compacted soils and loss of vegetation, due to creation of roads	Alternative 2 – Risk of habitat degradation is low because of formal grazing strategy, construction of water tank and new fence construction, resulting in better distribution of horses. For all actions except drought and fuel wood harvest, the effects are very localized and occur on about 10% of the area encompassed by the allotment.
Dispersed camping and hunter camps with stock	On-going	~ 10 acres	Compacted soils and loss of vegetation	
Fishing – creates trails along banks	On-going	~10 acres	Compacted soils and loss of vegetation	
Unspecified uses of private land (other grazing or construction)	On-going	Unable to quantify;	Loss of riparian vegetation, compacted soils and loss of vegetation	
Drought	2000 - present	Statewide	Stunted vegetative growth	

Table 8 Cumulative Effects on Sensitive Species

Sensitive Species known to occur on allotment - CE boundary/Size of area	Activities having potential to affect species	Direct/Indirect Effect of Action
Northern Goshawk 800 acres which includes the Iron Gate PFA	Stand replacing fire. One time occurrence.	Removal of nesting/roosting trees, foraging areas. Area would not provide suitable nesting/roosting habitat for the goshawk. Foraging habitat would recover the year after a fire.
	Dispersed camping and hunter camps with stock. Annual activity occurring for up to 8 months.	Loss of vegetation, minimizing forage for prey species. A reduction in prey species habitat would minimize food availability for small rodents and birds which would also minimize food availability for goshawks.
	Fishing – creates trails along banks. Annual activity occurring for up to 8 months.	Loss of vegetation, minimizing forage for prey species
	Drought. One time occurrence or series of months to years of occurrence.	Lack of tall grasses which provides hiding cover and food for prey species. Reduces food source for goshawks.

MIGRATORY BIRDS

AFFECTED ENVIRONMENT

On January 10, 2001, President Clinton signed Executive Order 13186 placing emphasis on conservation of migratory birds. The Forest Service, Southwestern Region, analyzes effects in the following manner: (1) effects to “Highest Priority” species as identified by New Mexico Partners in Flight, (2) effects to Important Bird Areas (IBAs), and (3) effects to important overwintering areas.

Species of Concern: New Mexico Partners in Flight considers eight risk factors in identifying conservation priority species: Global Abundance, NM Breeding Abundance, Global Breeding Distribution, NM Breeding Abundance, Threats to Breeding in NM, Importance of NM to Breeding, Global Winter Distribution, and threats on Wintering Grounds. Species with the highest risk factors are classified as “highest priority” for conservation action. This evaluation addresses general effects to migratory birds, and specific effects to highest priority species for the main habitat types found in the project area.

New Mexico Partners in Flight lists priority species of concern by vegetation type. Vegetation types found in this project area mixed conifer, ponderosa pine, high elevation riparian, aspen, and spruce-fir displays the species that may occur in or near the project area.

Table 9 High priority migratory birds

Vegetation type	Species	Habitat
Ponderosa pine	Flammulated Owl	Open ponderosa pine forest; Douglas- or white fir and blue spruce; aspen or larger shrub clearings
Ponderosa pine	Grace’s Warbler	Ponderosa pine sometimes with an oak component
Mixed conifer	Williamson's Sapsucker	<ul style="list-style-type: none"> • Mid- to high-elevation coniferous forests and mixed deciduous/conifer forests • live conifers preferred over snags and aspen; ponderosa pine and Douglas-fir preferred over other conifers • preferring snags or cavities in live aspen, aspen snags preferred over conifer snags

Mixed conifer	Olive-sided Flycatcher	<ul style="list-style-type: none"> • Subalpine forest with Englemann's spruce, ponderosa pine, Douglas-fir and aspen • Need forest edges for foraging • Needs snags or tree tops near open areas or above canopy • Nests in coniferous trees
Mixed conifer	Dusky Flycatcher	<ul style="list-style-type: none"> • Uses mixed conifer or ponderosa pine forest with a shrubby understory • Tends to choose shrubs with denser foliage for nesting • Openings near shrubs needed for foraging
Montane Shrub	MacGillivray's Warbler	Found in both montane riparian areas with low shrubs and in coniferous or deciduous forests with shrubby understory, often oaks
Spruce-fir	Blue Grouse	<ul style="list-style-type: none"> • Nests in virtually all montane forest communities with relatively open tree canopies; prefer forests dominated by ponderosa pine or Douglas-fir. • Nests almost always on ground with some overhead cover usually under shrubs, rock overhangs, logs or stumps; • Density of birds decreases as tree canopy increases.
Spruce-fir	Boreal Owl	See sensitive species write up.
High elevation riparian woodland	Hammond's flycatcher	Prefers spruce-fir, and mixed conifer forests, but also in ponderosa pine and aspen forests; generally with limited understory. They are mainly aerial foragers staying primarily in middle canopy.

Red-headed woodpecker, yellow-billed cuckoo, white tailed ptarmigan, loggerhead shrike or other priority species of concern were not considered, because they have not been detected, not found in the analysis area, do not have adequate habitat, or their habitat is not affected by grazing.

DIRECT, INDIRECT, AND CUMMULATIVE EFFECTS ON MIGRATORY BIRD SPECIES

Alternative 2: The proposed action would improve range conditions by constructing 0.8 mile of new pasture fence to improve distribution of horses throughout the allotment. The construction of fences would remove a few trees but there would be more than enough remaining to serve as habitat for the blue grouse, boreal owl, Williamson’s sapsucker, olive-sided flycatcher, Grace’s warbler, McGalivary’s warbler, flammulated owl, dusky flycatcher and the Hammond’s flycatcher. Constructing the fence would improve horse distribution and reduce grazing pressure throughout the allotment. Important habitat features such as downed logs and large snags would remain. Horses would remove grass where they graze, resulting in a very minimal decrease of habitat from when horses leave the allotment until the following spring when the grass grows back. There would not be a complete lack of cover, because grasses and forbs continue to grow during the growing season and because horses would be removed on mid-October or when utilization standards not to exceed 40% were met.

The proposed pasture fence would be built through a variety of habitats. The current spruce-fir, mixed conifer, montane shrub, ponderosa pine and high elevation riparian habitats would not be reduced. Since there would be very little activity in the previously described habitat type this would follow the recommended conservation strategies such as improving or maintaining good habitat for migratory birds within the habitats of the above vegetation types.

Important Bird Areas: There is no designated Important Bird Area (IBA) affected by the project. The IBAs on the Santa Fe National Forest are the Chama River Gorge and the Caja del Rio including the Santa Fe River Canyon below the Caja del Rio on both BLM and FS lands. There is no association or important link between the bird communities within the allotment and these IBAs. Therefore, no IBA would be affected by the proposed action.

Overwintering Areas: Many important over wintering areas are large wetlands and important overwintering areas recognized on the Forest. They include the Pecos River, Rio Chama and Rio Grande corridor. Since the allotment is not within these areas, there would be no impacts to overwintering areas.

MANAGEMENT INDICATOR SPECIES (MIS)

AFFECTED ENVIRONMENT

The Environmental Impact Statement (EIS, pgs. 146-148) for the Santa Fe National Forest Plan, adopted in 1987, (Forest Plan) identifies eight Management Indicator Species (MIS), bighorn sheep, Rocky Mountain elk, Mexican spotted owl, Merriam's turkey, Rio Grande cutthroat trout, hairy woodpecker, piñon jay and the mourning dove.

The reason these species were selected as MIS is described in the Environmental Impact Statement (EIS) for the Forest Plan. The objective was to select species that would indicate possible wildlife effects of changing plant communities and associated seral habitats that management activities are expected to affect. Other factors considered in the selection of these species were monitoring feasibility, migratory habits and habitat versatility. (Forest Plan EIS, page 96).

Management Indicator Species that have the probability of occurring on the Grass Mountain Allotment are; Rocky Mountain elk, Merriam's turkey and the hairy woodpecker. Rocky Mountain bighorn sheep, Rio Grande cutthroat trout, mourning dove and the piñon jay were eliminated based upon lack of potential habitat within the allotment. The Mexican spotted owl was discussed previously in the document in the Federally Threatened and Endangered species section. Information pertinent to the MIS that have the probability of occurring within the allotment is described as follows:

Rocky Mountain Elk: Elk inhabit most forest types with good forage and cover. These ungulates utilize a variety of habitat types during the course of their life. They appear to be extremely adaptable to both secondary successional and specific successional vegetation types. Elk habitat is common throughout the forest, encompassing about 1.6 million acres (USDA 2006). Approximately 3,636 acres of habitat as previously described are available for the Rocky Mountain elk on the allotment. Reconnaissance surveys of the allotment indicate that elk are present and abundant. Elk sign include; elk tracks, droppings, rubs, and markings on aspens (project record). In general, there is more than enough habitat to support the current population of elk on the forest, and the trend for habitat is considered stable. The population trend for the Rocky Mountain elk is ranked as increasing on the Forest (USDA 2006).

Merriam's Turkey: Merriam's turkey are an indicator of ponderosa pine, which is an essential component of its permanent habitat, while surface water is a range requirement. A good healthy ponderosa pine understory provides cover, as well as forage for turkeys. Besides ponderosa pine, turkeys also forage in grasslands, brush communities, and deciduous trees. Turkey habitat is common throughout the forest, encompassing about 1.3 million acres (USDA 2006). Approximately 498 acres of habitat as previously described are available for the turkey on the allotment. Reconnaissance surveys of the allotment indicate that suitable habitat is present for the turkey within various habitat types. There are many roost trees available as well as foraging and loafing areas. Surveys conducted by the USGS between 1968 and 1998 indicate an increasing population of wild turkeys within New Mexico (USGS 2004). Turkey habitat is abundant in the mid-elevation portions of the Santa Fe National Forest.

Hairy Woodpecker: Approximately 3,343 acres, of habitat is available for the hairy woodpecker on the Grass Mountain Allotment. Reconnaissance surveys of the allotment indicate that suitable habitat is present for the hairy woodpecker, yet large snags and large diameter dead and down wood are not abundant. At the time of the survey no woodpeckers were detected (project record).

In the MIS assessment for the Santa Fe Forest (USDA 2003), the Santa Fe Forest plan modeling predicted that hairy woodpecker habitat quality would improve over time as young trees mature into diameter classes acceptable as cover. Nesting habitat was more limiting than feeding habitat.

Large trees, which are future down logs and snags, are maintained across the Santa Fe National Forest in accordance with the Forest Plan and the background matrix of current snags and down logs. Snags and down woody debris comprise an important element to the background matrix of the forested landscape. Road accessibility and increasing demand for firewood make snags and down woody debris susceptible to removal. Areas with high road density have a higher rate of snag removal than areas with low road densities. In areas inaccessible to the public, snags are maintained under normal conditions at far greater numbers than the Forest Plan guidelines of 2-3 snags per acre, thus the National Forest supports adequate numbers of snags and down logs for hairy woodpecker habitat (USDA 2003). Prescribed burning and recent wildfires have created large snags in inaccessible areas (steep slopes) or areas with limited road access. In general, habitat affected by fire, disease and bug kill would have many more snags than the minimum levels required by the Forest Plan. The habitat trend for hairy woodpecker is considered stable for the Forest (USDA 2003).

This species is one of the most common woodpeckers in the Southwest, particularly in riparian habitats and in ponderosa pine, mixed species and spruce-fir forests. This species is widespread across the Santa Fe National Forest and can be found in any of the suitable habitat types (USDA 2003).

The hairy woodpecker population is ranked as abundant for the Santa Fe NF (USDA 2006). This means that the estimated number of breeding pairs ranges between 10,000 and 100,000. The population may fluctuate from year to year based on a variety of environmental factors. This estimate is based on the amount of habitat available, breeding bird surveys, local studies and the professional opinion of local biologists.

Surveys conducted by the USGS between 1968 and 1998 indicate a stable or increasing trend for hairy woodpecker within the state of New Mexico (www.mbr-pwrc.usgs.gov). The hairy woodpecker is listed as being globally, nationally, and State of New Mexico secure and common, widespread and abundant based on the Nature Conservancy's 2001 database. It is secure in New Mexico and 31 other states (NatureServe, 2001). The population of hairy woodpeckers is considered stable to increasing on the Santa Fe National Forest based on the trends seen within the State of New Mexico, observations on breeding bird surveys in or adjacent to the Forest, and habitat conditions within the Forest (USDA 2006).

DIRECT AND INDIRECT EFFECTS ON MANAGEMENT INDICATOR SPECIES

Alternative 1- No Grazing

Rocky Mountain Elk: Under Alternative 1 the risk that livestock would deplete forage enough to reduce the elk population and habitat would be eliminated. There would be no change in the amount of cover since no trees would be removed. The amount of forage would likely increase over time, maintaining the current forest wide trends for elk populations or habitat.

Merriam's Turkey: Under Alternative 1, the risk that livestock would deplete forage enough to reduce the turkey population and habitat would be eliminated. There would be no change in the number of nesting and roosting trees. The amount of forage would likely increase, maintaining the current forest wide trends for increasing turkey populations or habitat.

Hairy Woodpecker: Under Alternative 1, there would be no change to woodpecker populations and habitat because this species relies primarily on dead and down logs, snags, and trees greater than 11 inches in diameter. Neither the quantity nor quality of these features would change by removing livestock. Thus, this alternative would maintain forest trends for the woodpecker and its habitat.

Alternative 2- Proposed Action

Rocky Mountain Elk: The proposed action would improve the quality of elk foraging habitat on this allotment by constructing a fence to improve distribution of horses throughout the allotment. This would improve ground cover by forcing horses to graze more evenly across the allotment and reducing grazing pressure. Because horses would not be allowed to use more than 40% of the forage, grazing would be conservative and would not greatly reduce the amount foraging habitat, as is true with the existing condition. Alternative 2 would not change the quality or quantity of elk cover habitat. The construction of a fence would remove a few incidental trees, there would be more than enough remaining trees to serve as thermal and hiding cover and calving and resting areas. Because this alternative would not change habitat or populations on the allotment, it would not change forestwide trends.

Elk would avoid areas where and when construction of fences and were taking place. Alternative 2 may disturb elk during the construction of fences, but this would only last the duration of the construction activities, no more than 1 month, and would be in the immediate vicinity of construction only.

Merriam’s Turkey: The proposed action would improve the quality of turkey habitat on this allotment by constructing a fence to improve distribution of horses throughout the allotment. This would improve ground cover and turkey foraging areas by forcing horses to graze more evenly across the allotment and reducing grazing pressure. Though the construction of a fence would remove a few incidental trees, there would be more than enough remaining trees to serve as nesting and roosting habitat, which are important components for the turkey. Because cattle would not be allowed to use more than 40% of the forage, grazing would be conservative and would not greatly reduce the amount foraging habitat, as is true with the existing condition (project record). Horses would remove grass where they graze, resulting in a very minimal decrease of habitat from when the horses leave the allotment until the following summer when the grass grows back. There would not be a complete lack of cover, because grasses and forbs continue to grow during the growing season and because horses would be removed in mid-October or when utilization standards were met. Because this alternative would not change habitat or populations on the allotment, it would not change forestwide trends.

The proposed action would disturb or displace turkeys during the construction of a fence, but this would only last the duration of the construction activities, no more than 1 month, and would be in the immediate vicinity of construction only.

Hairy Woodpecker: The proposed action would not change the quantity or quality of woodpecker habitat on this allotment because no dead or down logs, trees greater than 11 inches in diameter, or snags, its main habitat elements, would be removed or added. The construction of a fence would remove a few incidental trees or snags, there would be more than enough remaining to serve as nesting, roosting, and foraging habitat. Thus, this alternative would not change the current forest trends for woodpecker populations or habitat.

The proposed action would disturb or displace woodpeckers during the construction of the fence, but this would only last the duration of the construction activities, no more than 1 month, and would be in the immediate vicinity of construction only.

CUMULATIVE EFFECTS ON MANAGEMENT INDICATOR SPECIES

Alternative 2: The proposed action would remove light to moderate amounts of vegetation while horses are grazing in these areas, and for a month or two afterwards until the vegetation has time to grow back. The cumulative effects would apply to the following species’ habitats because they have are known to occur in the Grass Mountain allotment: northern goshawk, Rocky Mountain Elk, Hairy woodpecker and Merriam’s turkey.

The temporal boundary of this analysis is from 10 years ago to the projects listed on the Santa Fe National Forest’s Schedule of Proposed Actions or other projects in official planning status. The reason for the temporal

boundary is that activities that occur in the allotment will remove moderate to conservative amounts of vegetation. This vegetation will recover on an annual basis, so cumulative effects are relatively short-lived, and going back 10 years would capture changes. The geographical area is listed below for each species.

Table 10 Cumulative Effects on MIS

Management indicator Species known to occur on allotment - CE boundary/Size of area	Activities having potential to affect species	Direct/Indirect Effect of Action
Rocky Mountain Elk Middle and Upper Pecos Canyon, Lower Pecos Wilderness. Approximate 60 mile radius.	Stand replacing fire. One time occurrence.	Removal of thermal/hiding cover, calving areas, foraging areas. Area would not provide suitable habitat for the elk in the short term. Foraging habitat would recover the year after a fire.
	Dispersed camping and hunter camps with stock and hunting. Annual activity occurring for up to 8 months.	Loss of vegetation, minimizing forage for elk to consume. A reduction in foraging habitat would minimize food availability for elk. Disturbance to elk by campers occupying elk habitat. Elk would be forced to occupy other areas of suitable habitat. Direct harvest of elk by hunters. Elk numbers slightly reduced till following year when elk calves are born.
	Drought. One time occurrence or series of months to years of occurrence.	Lack of tall grasses which provides food for elk. Reduces food source for elk.
	Grazing by horses. Annual activity occurring for up to 4 ½ months.	Minimal reduction in forage due to horses grazing on allotment. Minimally reduces foraging habitat and food source for elk.
Merriam’s Turkey Middle and Upper Pecos Canyon. Approximate 30 mile radius.	Stand replacing fire. One time occurrence.	Removal of roosting/nesting trees, foraging areas. Area would not provide suitable habitat for the turkey in the short term. Foraging habitat would recover the year after a fire.
	Dispersed camping and hunter camps with stock and hunting. Annual activity occurring for up to 8 months.	Denuded vegetation, minimizing cover for insects that turkeys consume. A reduction in foraging habitat would minimize food availability for turkeys. Disturbance to turkeys by campers occupying turkey habitat. Turkeys would be forced to occupy other areas of suitable habitat. Direct harvest of turkey by hunters. Turkey numbers slightly reduced till following year when turkey poults are born.
	Drought. One time occurrence or series of months to years of occurrence.	Lack of tall grasses which provides habitat for insects. Reduces food source for turkeys.
	Grazing by horses. Annual activity occurring for up to 4 ½ months.	Minimal reduction in forage due to horses grazing on allotment. Minimally reduces foraging habitat and food source for turkeys.
Hairy Woodpecker 25 acres-includes foraging areas, non-migratory birds	Stand replacing fire. One time occurrence.	Removal of roosting/nesting trees, foraging areas. Area would not provide suitable habitat for the turkey in the short term. Foraging habitat would recover the year after a fire.
	Drought. One time occurrence or series of months to years of occurrence.	Lack of moisture would cause stress on trees and increase numbers of insects that forage upon trees. Increases food source and nesting/ foraging areas for hairy woodpeckers.

FISHERIES

AFFECTED ENVIRONMENT

The Grass Mountain allotment is divided by the Rio Mora-Pecos River and Rio Mora Watersheds. The Mora River forms the eastern boundary of the allotment, and the Pecos Wild and Scenic River Management Area boundary serves as the northwestern boundary of the allotment. Rio Grande cutthroat trout are found within both the Rio Mora and the upper Pecos River. However, their occupied reaches are upstream from the allotment boundary. In addition, both rivers flow through deep valleys with near vertical slopes and it is unlikely that horses are able to get to either river along most of the boundary of the allotment. Therefore, any potential for restoration of Rio Grande cutthroat trout to either the Pecos River or the Mora River would not be compromised by grazing in the Grass Mountain Allotment, as impacts to instream habitat should be minimal. Furthermore, Rio Grande cutthroat trout habitat does not occur in the Grass Mountain Allotment or immediately down stream from the allotment. Therefore, no further evaluation or analysis will occur for the Rio Grande cutthroat trout because the species and habitat for the species does not occur in the allotment.

RECREATION

AFFECTED ENVIRONMENT

The Grass Mountain Allotment contains approximately 3,636 acres of the Pecos Wilderness. Congress designated 165,000 acres of the Pecos Wilderness in 1964 under “The Wilderness Act,” (P.L. 88-577). The New Mexico Wilderness Act (P.L. 96-550) added 55,000 acres to the Pecos Wilderness in 1980. Today the Pecos Wilderness totals 223,333 acres. Approximately one percent of the Pecos Wilderness is in the allotment.

Wilderness Attributes - Existing Condition:

Natural Integrity: The Grass Mountain Allotment receives both moderate to high recreation use due to its close proximity to the Pecos River Canyon corridor and because access into the northeast corner of the Pecos Wilderness is through the allotment.

The Grass Mountain Allotment experiences recreation activities such as hiking, camping, hunting, horseback riding, and limited cross country skiing. The natural integrity is not affected substantially by recreation use. Wilderness trails crisscross throughout the allotment and access proves to be difficult for some recreationists. Pressure from backpacking and horseback riding exist; however, human activity has minimal affect of the natural ecological process in the area.

Apparent Naturalness: Human-caused visible modifications of the environment, such as widened trails, some trash, fire rings, and campsites, are present on the allotment. The moderate to high recreation use in the allotment has minimal human affects to the naturalness of these areas.

Remoteness and Solitude: Due to its proximity, the allotment is particularly used for access points into the Pecos Wilderness. Sights and sounds of civilization are minimal. The opportunity to experience solitude does exist within the allotment, specifically in wilderness.

Opportunities for Primitive Recreation: Ample opportunity exists for primitive recreation, such as camping, hunting, hiking, backpacking, horseback riding, and orienteering. There are developed recreational facilities in close proximity to the allotment, thus providing support facilities and staging areas for primitive recreation opportunities.

Special features: Iron Gate Campground and Trailhead is a popular recreation designation and located in the allotment.

Manageability: The Pecos Wilderness is a contiguous land area although the northern portion of the wilderness is managed by the Carson National Forest. Management of the Pecos Wilderness is relatively straightforward because it is managed by one federal agency.

Recreation - Existing Condition:

Recreation use within the allotment is moderate to high due to the close proximity of Pecos and Las Vegas, the Iron Gate Campground, Trailhead and Recreation Residence Area, and private land in-holdings. Recreational activities in the project areas include hiking, backpacking, limited cross country skiing, dispersed camping, hunting, and horseback riding illustrated in the table below.

There are numerous Special Use Outfitter and Guide permittees that provide hunting and horse riding related activities in the allotment area.

Table 11 Recreational Activities on the Allotment

Action(s)	Date of Action	Area	Comments
Hiking/Backpacking	May thru Nov.	Throughout the allotments	There is little cross country skiing activity in the allotment. Since cross-country skiing occurs only when there is sufficient snow cover it is unlikely this activity results in cumulative impacts to soil resources, water resources, or other resources in the allotment. Recreational snow-shoeing may be considered a related activity.
Cross-Country Skiing	Oct. thru Feb.	Throughout the allotment	Dispersed camping occurs throughout the allotment. The Iron Gate Campground and Trailhead is located in the allotment, and is one of the main access points into the Pecos Wilderness.
Dispersed Camping	May thru Dec.	Throughout the allotment	The allotment is hunted for big game in the fall, as well as spring turkey and mountain lion hunts, as per Game and Fish Dept. regulations
Hunting	Aug thru April	Throughout the allotment	All allotments are hunted for big game in the fall, as well as spring turkey and lion, as per Game and Fish Dept. regulations.
Horseback Riding	May thru Jan	Throughout the allotment	The allotment is a popular area for horseback riding

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

DIRECT AND INDIRECT EFFECTS ON RECREATION

Wilderness Attributes – Direct & Indirect Environmental Effects

Alternative 2 - Although wilderness is present, the effects measured in terms of extent, direction, duration, and rate of change, would probably be negligible. Except for the new fence construction and the expected improved distribution, there would be no change because horse grazing would essentially continue as currently managed.

The direction of change on wilderness would remain the same because current management is not causing measurable effects to the wilderness attributes described above.

Natural Integrity: As described in the existing condition, the natural integrity of the wilderness is minimally affected by recreational use. Livestock grazing would not be expected to additionally alter the natural integrity of the wilderness because of the small number of horses and low grazing intensity.

Apparent Naturalness: The continued presence of horses would not affect the apparent naturalness of the wilderness for the reasons stated in the above paragraph. Sheep and cattle grazing in the Pecos Wilderness has occurred for at least 100 years, and with the introduction of managed grazing, the apparent naturalness has improved since the beginning of the century.

Remoteness and Solitude: The presence of horses would not affect the remoteness of the allotments because it would not change how the wilderness is managed. It could affect the solitude of people recreating if they encountered horses. Their interaction with people is expected to be infrequent because of the small number of horses and area available for grazing, people tend to appreciate horses more than cattle, since the horses are used for riding trips, less than 18 are usually on the allotment at any given time, and the horses graze for 4 ½ months (June 1 to October 15).

Opportunities for Primitive Recreation: The presence of horses grazing would not change the opportunities for primitive recreation described in the existing condition because they would not preclude any of the identified recreational activities.

Special Features: Horses would possibly be seen at or in the vicinity of the mentioned features (Iron Gate Campground and Trailhead) but their presence would be transitory.

Manageability: The presence of horses would not change the size, boundary, shape, or access to the wilderness so its manageability would not affect.

Recreation – Direct & Indirect Environmental Effects

Alternative 2: The proposed action would not affect hiking, backpacking, limited cross country skiing, dispersed camping, hunting, and horseback riding or recreational special uses because these uses have continued concurrently for many years with little or no apparent adverse affects. Encounters between people and horses have been low in the allotment because of its large size and the small number of permitted horses.

Therefore, no measurable direct and indirect effects to wilderness attributes or recreational use would be expected.

CUMULATIVE EFFECTS ON RECREATION

Since current management is expected to result in very little direct or indirect effects to recreational use of the proposed project area, there are no cumulative effects from the proposed action.

The proposal to continue current grazing management on these allotments is consistent with agency policy concerning extraordinary circumstances. Though Wilderness is present, the degree of effect is expected to be immeasurable in terms of extent, direction, duration, and speed. There is no change in the extent of the effect since livestock grazing would continue as currently managed; no new areas to be grazed are proposed. The direction of the effect on wilderness would remain the same because the current management is not causing measurable effects to the wilderness attributes described above. There would be no duration or speed of change associated with the proposal to continue grazing under current management because little change is expected.

CULTURAL RESOURCES

No cultural resource sites had been located by previous cultural resource surveys within the allotment. One site was located and recorded during reconnaissance of high livestock congregation areas and proposed ground disturbing improvements within the allotment. The site's National Register eligibility is currently undetermined. There is evidence of on-site grazing by livestock (e.g. dung, trailing, hoof prints, livestock grazing at the time of site recording). However, grazing does not appear to be adversely affecting those qualities of the site that may make it eligible for inclusion in the National Register of Historic Places. The site will be monitored over the next ten years or until the Allotment Management Plan is revised. Disturbance to cultural resource sites related to livestock grazing on the allotment is not significant.

Letters were sent to 26 Native American tribes as part of the NEPA scoping and Section 106 consultation processes on April 8th, 2008. One tribe, the Navajo Nation responded to the scoping/consultation letter on April 16th, 2008. The tribe stated that the proposed re-issuance of the Grass Mountain Grazing Permit would not impact any Navajo traditional cultural properties or historical properties. No other tribes responded to the scoping/consultation letter with concerns regarding re-issuance of the grazing permit. No historic properties or properties with traditional importance to Native Americans have been identified within the allotment. If tribal concerns are raised later, the Forest will initiate further consultation.

The Forest Plan requires the survey and protection of cultural resources, the assessment of effects on cultural resources, and consultation with Native American tribes. The latest listing of the National Register of Historic Places was consulted. No sites on the Register and no sites that have been nominated to the Register occur within the allotment. The heritage resources evaluation report meets all requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, 36 CFR 800 Regulations, Executive Order 11593, FSM 2360, FSH 2309.24 guidelines and Appendix H (Standard Consultation Protocol for Rangeland Management) of the Region 3 First Amended Programmatic Agreement Regarding Cultural Property Protection and Responsibilities. The State Historic Preservation Officer (SHPO) concurred with a No Adverse Effect determination on September 22, 2008 for re-issuance of the Grass Mountain Allotment grazing permit. The full text and rationale of the heritage resources evaluation report is on file with the project record at the Santa Fe National Forest Supervisor's Office in Santa Fe.

ENVIRONMENTAL JUSTICE AND SOCIAL ECONOMICS

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 Grass Mountain allotment is located in San Miguel County, New Mexico, of which, 11% percent is Forest Service ownership. In 2006, the population of San Miguel County was estimated at 29,325 and consisted of approximately, 76.8% Hispanic, 19.8% White (Non-Hispanic), and 2.3% Native American. Approximately 81% of the population is minority (U.S. Census Bureau Quick Facts). The median household income in 2004 was \$27,972 with 21.4% of the population in San Miguel 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.

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 CITES

- Corkran, C. and C.R. Thomas, 1996. Amphibians of Oregon, Washington, and British Columbia. Lone Pine Publishing, Renton, WA.
- Degenhardt, William, C. Painter, A. Price. 1996. Amphibians and Reptiles of New Mexico. University of New Mexico Press, Albuquerque, New Mexico.
- Fitzgerald, J. P., C. A. Meaney, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado, 467 pp.
- Holechek, Jerry L., Rex D. Piper, and Carlton H. Herbal. 1989. Range Management Principles and Practices. Prentice-Hall, Inc. Englewood Cliffs, NJ.
- Holechek, Jerry L. and Dee Galt. 2000. Grazing Intensity Guidelines *in* Rangelands 22 (3). June 2000. pp 11-14.
- 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.
- Kershaw, Linda, A. MacKinnin, and J. Pojar. Plants of the Rocky Mountains. 1998. Lone Pine Publishing, Edmonton, AB, Canada
- Lujan, Michael. 2007 Natural Resources Staff. Pecos-Las Vegas District, Santa Fe National Forest.
- Marshall, W.H. 1936. A study of the winter activities of the mink. *J. Mamm.*, 17- 382-392.
- McNab, 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.
- Nelson, E. Unpublished field notes (project record). 2007.
- New Mexico Department of Game and Fish. 2007. BISON-M (Biota InformationSystem 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. 2004. 2004 State of New Mexico Integrated Clean Water Act §303(d)/§305(b) Report.
- New Mexico Environment Department, Surface Water Quality Bureau. 2005. State of New Mexico Standards for Interstate and Intrastate Surface Waters 20.6.4 NMAC (as amended through July 17, 2005).
- New Nexico Natural Heritage. Organism and Ecosystem website, <http://nhnm.unm.edu/botany/index.html>
- New Nexico Natural Heritage. Botany website, <http://nhnm.unm.edu/botany/index.html>

- 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.
- Reynolds, R.T., Graham, R. T., Reiser, M. H. and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. Gen. Tech. Rep. RM-217. Ft. Collins, CO: U. S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 90 p.
- Stahlecker, Dale, and J. J. Rawinski. 1990. First Records for the Boreal Owl in New Mexico. *The Condor*. 95:517-519.
- USDA Forest Service. 1987. Environmental Impact Statement, Santa Fe National Forest Plan. Santa Fe National Forest: Santa Fe, NM.
- USDA Forest Service. 1992. Management Recommendations for the Northern Goshawk in the Southwestern United States. GTR RM-217.
- USDA Forest Service. 2003. Santa Fe National Forest, Management Indicator Species Assessment, with Dec. 2004 update for the Rio Grande cutthroat trout. Santa Fe National Forest: Santa Fe, NM.
- USDA Forest Service. 2004. Draft Supplement to the Final Environmental Impact Statement for Amendement of Forest Plans. USDA Forest Service, Southwestern Region, Arizona and New Mexico. Southwestern Regional Office, Albuquerque, New Mexico. Pp15-28.
- 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 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.
- USDI, Fish and Wildlife Service. 1995. Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*): Volumes I and II. Albuquerque, NM: US Department of Interior, Fish and Wildlife Service. Volume I, 172 p. and Volume II 145 p.
- United States Geological Survey. 2004. Patuxent Bird Population Studies. <http://www.mbr-pwrc.usgs.gov/>.
- Valentine, John F. 2001. Grazing Management, 2nd Edition. Academic Press, San Diego, California.

Vavra, Martin, William A. Laycock and Rex D. Pieper. 1994. Ecological Implications of Livestock Herbivory in the West. Society for Range Management.

APPENDIX B – TEU POTENTIAL AND DESIRED CONDITIONS

Grass Mountain Allotment TEU - 251					
Designated Area - TES Unit- 251- Timber oatgrass grassland located on an elevated plain on the Grass Mountain Allotment with a slope of 24%.					
	Vegetation			Soils (Ground Cover %)	
Potential	<u>Grasses</u>	<u>Forbs</u>	<u>Shrub</u>	Bare soil	0
	10 species	7 species	1 species	Rock	15
	75% c. cover	7% c. cover	0.1% c. cover	Litter	40
	Feth 25%	Poan 3%	Pofr <0.1%	Vegetation	60
	Feov 25%				
	Dain 15%				
Desired Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil	0 - 1
	6-10 species	1-5 species	0-3 species	Rock	0 - 15
	60-75% c.cover	3-8% c. cover	0-2% c. cover	Litter	13 - 45
	Dain 10-20%	various species		Vegetation	55 - 70
	Feov 12-30%				
	Kopy 0-12%				
Existing Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil	0.54
	6 species	1 species		Rock	0
	65.5% c. cover	3.3% c.cover		Litter	15.2
	Dain 15%	Acla 3.3%		Vegetation	68.8
	Feov 14%				
	Kopy 10%				
Rangeland Management Status	High similarity and static trends.				
Rangeland Capacity Rating	Full Capability				
Soil Condition Rating	N/A				
Objectives	Maintain or improve existing conditions while grazing horses.				
Monitoring	Continued monitoring of the frequency and ground cover plots at the long term sites will determine trend.				

Grass Mountain Allotment TEU - 213					
Designated Area - TES Unit 213- Hills, mountains, 26% slope					
	Vegetation			Soils (Ground Cover %)	
Potential	<u>Grasses</u>	<u>Forb</u>	<u>Shrubs</u>	Bare soil	0
	6 species	20 species	13 species	Rock	25
	2% c. cover	15.2% c. cover	18% c. cover	Litter	90
	Carex 1.5%	Erex 5%	Quga 8%	Vegetation	10
	Brci 0.5%	Arfr 2%	Bere 3%		
		Frov 2%			
Desired Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil	0 - 10
	5-10 species	5-20 species	3-13 species	Rock	15 - 30
	2-15% c. cover	10-20% c.cover	7-18% c. cover	Litter	50 - 90
				Vegetation	5 - 30
Existing Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil	
				Rock	
				Litter	
				Vegetation	
Rangeland Management Status	Satisfactory				
Rangeland Capacity Rating	Full Capability				
Soil Condition Rating	N/A				
Objectives	Maintain or improve vegetative diversity while grazing cattle.				
Monitoring					

Grass Mountain Allotment TEU - 212				
Designated Area - TES Unit 212- Elevated plains 8% slope.				
	Vegetation			Soils (Ground Cover %)
Potential	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil0
	6 species	20 species	13 species	Rock 25
	2% c. cover	15.2% c. cover	18% c. cover	Litter 90
	Carex 1.5%	Erex 5%	Quga 8%	Vegetation 10
	Brci 0.5%	Arfr 2%	Bere 3%	
		Frov 2%		
Desired Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare 0 - 10
	5-6 species	2-20 species	0-13 species	Rock 1 - 30
	2-70% c.cover	15-25% c.cover	0-18% c. cover	Litter 15 - 90
	Carex 1-4%	various species		Vegetation 5 - 60
Existing Condition	<u>Grasses</u>	<u>Forbs</u>	<u>Shrubs</u>	Bare soil
				Rock
				Litter
				Vegetation
Rangeland Management Status	Low similarity			
Rangeland Capacity Rating	Full Capability			
Soil Condition Rating	N/A			
Objectives	Maintain or improve vegetative diversity while grazing cattle.			
Monitoring	Continued monitoring of the frequency and ground cover plots at the long term sites will determine trend.			