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Environmental Assessment

Chiquito, Gurule, Llaves, Ojitos, and Pollywog Range Allotment Analysis

Cuba Ranger District, Santa Fe National Forest
Rio Arriba County, New Mexico

Township 25 North, Range 1 West, Sections 1-3, 10-13, 24-26, 35, 36
Township 25 North, Range 1 East, Sections 1-22, 30-31
Township 25 North, Range 2 East, Section 6, 7
Township 26 North, Range 1 West, Sections 1-36
Township 26 North, Range 1 East, Sections 2-36
Township 26 North, Range 2 East, Sections 7, 18, 19, 30, 31

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1.0 PURPOSE OF AND NEED FOR ACTION

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from implementation of the proposed action and alternatives. Supporting documentation, including more detailed analyses of project-area resources and interdisciplinary team meeting notes, are on file in the project planning record at the Jemez Ranger District Office in Jemez Springs, New Mexico.

1.1 Proposed Action

The Cuba Ranger District, Santa Fe National Forest proposes to continue to authorize livestock grazing on the Chiquito, Gurule, Llaves, Ojitos and Pollywog allotments under the following terms:

- Season of Use. Anticipated normal season start and end dates are listed in Table 1[1]. Actual start dates may vary annually in response to range readiness or other management concerns. Range readiness will be the primary determining factor for earliest entry dates and those dates may be adjusted annually up to two weeks earlier than the dates listed or to delay entry by 30 days. Season end dates may occur 30 days prior to or after the listed date, depending on ecological conditions as determined through monitoring, including forage utilization levels.

- Animal Unit Months (AUM). The anticipated range of annual AUMs to be authorized for each allotment is listed in Table 1. Based on the variability in annual forage production in this area during the previous 30 years, it is reasonable to anticipate a variation between 70 and 130 percent of average AUMs on an annual basis[2].

Table 1. Proposed Authorization

Allotment	Normal Season	Range of Authorized AUMs
Chiquito	5/15 – 11/30	450-850
Gurule	5/1 – 11/15	450-850
Llaves	5/1 – 12/31	800-1500
Ojitos	5/1 – 11/30	250-500
Pollywog	5/1 – 12/31	800-1500

[1] Under adaptive management, the number of permitted cattle, season of use, and total head months can vary from year to year based on resource conditions. Forage availability, range readiness, and utilization are some of the parameters monitored to determine resource conditions. In a given year, there may be changes in the season of use, pasture rotation schedule, and the number of authorized cattle.

[2] Information presented throughout this document specific to season of use, number of cattle, etc., represents an average based on average AUMs of forage available during the past decade of use. An AUM is the amount of oven-dry forage (forage demand) required by one animal unit for a standardized period of 30 animal unit days. An animal unit is considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to six months of age, or their equivalent. The average value for an animal unit month is 780 pounds of oven dry forage.

- The following facilities work would be accomplished to address various grazing management, watershed and wildlife objectives. They are presented in greater detail in Table 2:
  - Construct an earthen stock water pond on Chiquito allotment
  - Repair or replace a well on the Gurule allotment
  - Construct an earthen stock water pond on the Gurule allotment
  - Remove four miles of fence on Llaves allotment
  - Construct 0.5 mile new fence on Llaves allotment
  - Construct an earthen stock water pond on the Llaves allotment
  - Construct a new corral on the Ojitos allotment
  - Reconstruct an earthen stock water pond on the Ojitos allotment
  - Construct an earthen stock water pond on the Ojitos allotment
  - Expand an existing earthen stock water pond on the Ojitos allotment
  - Treat an existing population of musk thistle on the Ojitos allotment
  - Construct 1.75 mile new fence on Pollywog allotment
  - Construct eight erosion control dams on Pollywog allotment
  - Construct an earthen stock water pond on Pollywog allotment

1.2 Purpose and Need

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

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

The allotments contain lands identified as suitable for domestic livestock grazing in the Santa Fe National Forest Plan and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the forest plan.

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

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

There is a need for change from current management as the allotment is not meeting or moving toward desired conditions in an acceptable timeframe. Specific desired conditions not being met are as follows:

- Management flexibility to respond to changing resource conditions
- Acres in satisfactory range management status

- Soil retention and vegetation growth along eroding arroyos
- Control of invasive plant species
- Unimpeded wildlife movement
- Relative distribution of livestock grazing

Table 2. Facilities - Purpose and Need

Allotment	Proposed Action	Need	Purpose (Objective)
Chiquito	Construct a new water development in Section 2 of the Archuleta pasture.	Due to lack of water throughout the pasture, cattle congregate at a water development in Section 10 adjacent to private land while other portions of the Archuleta pasture are not utilized.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.
Gurule	Repair the well in Section 18 of the Jacquez/Salazar pasture. If the well cannot be repaired, drill a new well in the same vicinity.	The existing well in Section 18 of the Jacquez/Salazar pasture is not functioning. The well supplies two pipelines that access large portions of the allotment.	Ensure a reliable water source to allow for greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the allotment and ensure utilization does not exceed established standards.
Gurule	Construct one earth water tank in Section 13 along the north end of the Lower Gurule pasture.	While utilization in some areas is approaching 40% (within standards) the northern portion of the Gurule pasture receives little to no use.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.
Llaves	Remove four miles of fence in Lower Deadhorse pasture.	Four miles of fence (along the west boundary of the Lower Deadhorse pasture) was constructed in the 1960s as part of sage brush treatments. The fence is ineffective and is in poor repair (loose wire); posing a threat to elk that travel through the area.	Provide unimpeded and safer wildlife travel in the Lower Deadhorse pasture.

Allotment	Proposed Action	Need	Purpose (Objective)
Llaves	Constructing three short segments of new fence (approximately ½ mile total) to realign Lower Deadhorse pasture boundaries to tie in with natural barriers (cliff/and ridges).	Limit the amount of new fence construction.	Provide greater management flexibility in periods of drought, fire or other events.
Llaves	Construct one earth water tank in Section 11 of the Lower Deadhorse pasture.	Cattle do not fully utilize the Lower Deadhorse pasture. While utilization in portions of the pasture is approaching 40% (within standards) other areas receive little to no use.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.
Ojitos	Construct a new corral in Section 22.	The Ojitos allotment does not have a corral to aid in management of cattle. Currently permittees truck in portable corrals as needed.	Provide for more efficient permittee management of cattle during round-up, inoculations, and to care for sick cattle.
Ojitos	Reconstruct a non-functioning earthen stock water pond in Section 34 in the northern portion of Bull pasture.	While utilization in some areas is approaching 40% (within standards) other areas receive little to no use.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.
Ojitos	Construct a new earthen stock water pond in Section 19 in the western portions of the Wolf Draw pasture.	While utilization in some areas is approaching 40% (within standards) other areas receive little to no use.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.
Ojitos	Expand an existing earthen stock water pond (#3) in Section 15 of the Deer Run pasture.	While utilization in some areas is approaching 40% (within standards) other areas receive little to no use.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.

Allotment	Proposed Action	Need	Purpose (Objective)
Ojitos	Hand treat (pull, grub, or clip seed heads) musk thistle at the pond in Section 16 (about 2 acres).	Musk thistle is an invasive species that can be controlled by hand treatment.	Control the spread of an invasive plant species.
Pollywog	Construct 1.75 miles new fence to divide the existing Mud Springs pasture into two pastures - an upper and lower.	Cattle tend to congregate in the northern and central portions of the 8 mile long Mud Springs pasture, leaving portions of the pasture unutilized. Utilization in the northern and central portions of the allotment is approaching 40% (within standards) while the southern portion is at 5-10%.	Provide greater management flexibility in periods of drought, fire or other events.
Pollywog	Construct 8 restoration dams along an eroding arroyo running through sections 27 and 34 of the Experimental pasture.	An arroyo continues to downcut in the eastern portion of the Experimental pasture. The downcutting results in soil and vegetative loss.	Improve soil retention and vegetative growth, and provide for more management flexibility in periods of drought, fire or other events.
Pollywog	Construct an earthen stock water pond in Section 22 in the northern portion of the Experimental pasture.	Vegetation near water developments in the southern portion of the Experimental pasture receives a higher than desired level of use due to lack of water in the northern portion of the pasture.	Provide greater management flexibility in periods of drought, fire, or other unforeseen events by allowing managers to utilize current unused/light used portions of the pasture and ensure utilization does not exceed established standards.

1.3 Existing Situation

Location - the five allotments are located along the northern most portion of the Santa Fe National Forest (Map 1) in:

Township 24 North, Range 1 West, Sections 2-4, 9, 10, 16-21, 29, 30
Township 25 North, Range 1 West, Sections 1-3, 10-14, 23-27, 33-36
Township 25 North, Range 1 East, Sections 1-22, 30-31
Township 25 North, Range 2 East, Section 6, 7
Township 26 North, Range 1 West, Sections 1-36
Township 26 North, Range 1 East, Sections 2-36
Township 26 North, Range 2 East, Sections 7, 18, 19, 30, 31

Setting - the five allotments have common boundaries and combined encompass approximately 72,500 acres (approximately 3,200 of which are located on private lands; not under the jurisdiction of the Forest Service). The allotments are bounded on the north by the Jicarilla Apache reservation, to the south and west by private and Bureau of Land Management lands, and to the east by the Coyote Ranger District and the Chama River Canyon Wilderness. Interspersed throughout the five allotments are private land

inholdings. State Highway 112 runs through the center of the allotments and Forest Roads 3, 5, 6, 7, 310, 312, 313, 505, 515 and 520 serve as additional access roads.

The allotments are located along the eastern edge of the San Juan Basin where topography is characterized by steep sided canyons, mountainous terrain, and long rocky ridges (locally referred to as hogbacks), interspersed with open sage covered flats and grassy canyon bottoms. Canada Ojitos is the main canyon in the Ojitos allotment and Forest Road 312 meanders along much of the canyon bottom. The canyon is oriented in a general north/south direction and is fed by numerous side canyons including Deer Run, Boot Jack Canyon, Lang Canyon, Bond Canyon, Wolf Draw, and Canada Jose.

In the Pollywog allotment, the steep sided Corral Canyon and Spring Canyon are also oriented in a north/south direction. These canyons are not accessible by road and for this reason are generally not grazed. The southeastern portion of this allotment is marked by a long, narrow hogback ridge. This ridge marks the boundary between Pollywog and Llaves allotment.

Gallina Mountain, a long mountainous ridge, runs through the eastern portion of the Chiquito and Llaves allotments. The eastern flank of this ridge drains toward the Chama River located about four air miles away. The western side of this ridge drains into several dry arroyos including Achuleta and Chupadero Arroyo.

The southern most of the five allotments is the Gurule allotment. This allotment is oriented in a general northeast/southwest direction with the continental divide running through a portion of the allotment. From the divide, Canada Gurule drains to the northeast and Canada Jacquez to the southwest. Both drainages are intermittent and flow during summer rain events as well as spring snowmelt run-off.

Elevations range from high mountain peaks including Gallina Peak at 8,977 feet above mean sea level (northeast portion of Chiquito allotment) and Dead Man Peak at 8,786 feet (eastern portion of Llaves allotment) to low sage brush flats and canyon bottoms ranging between 7,000 and 7,300 feet. Numerous ephemeral drainages and arroyos run through the allotments; however, very few perennial or intermittent streams exist in the allotments.

Grazing Management - Table 3 displays information regarding current grazing management on all five allotments. The current grazing management system and the range of annually authorized AUMs of grazing use are displayed in this table. Start dates for the season of use may vary from two weeks earlier to one month later than the average date shown based on a range readiness determination that indicates resources are in a condition capable of supporting the beginning of the grazing season. Similarly the actual end date may vary by up to one month depending on resource conditions.

Table 3. Existing Situation

	Chiquito	Gurule	Llaves	Ojitos	Pollywog
Total Acres	12,840	8,243	11,729	18,527	21,159
National Forest	11,470	8,243	10,774	18,372	20,449
Private	1,370	0	955	155	710
Range Management Status					
Satisfactory	69%	93%	95%	84%	70%
Unsatisfactory	31%	7%	5%	16%	30%
No. of Pastures	4	4	7	8	4
Range Structures					
Springs Developments	2	0	4	1	2
Earthen Tanks	10	11	7	9	17
Restoration Dams	0	16	0	5	0
Corrals	0	1	2	0	0
Wells	1	1	0	0	1
Storage Tanks	0	1	1	0	1
Fences (miles)	14.5	9.5	13.25	13	13.25
Grazing System	Deferred Rotation[3]	Deferred Rotation	Deferred Rotation	Deferred Rotation	Deferred Rotation
Authorized AUM Range	650-1200	450-850	800-1500	200-350	800-1500
Normal Season	5/1 – 12/31	5/1 – 11/15	5/1 – 12/31	5/1 – 11/30	5/1 – 12/31

1.4 Management Direction

The Santa Fe National Forest Plan (Forest Plan) identifies the national forest lands within the five allotments as suitable for domestic livestock grazing. The project proposal and action alternatives were designed to conform to Forest Plan direction, goals, and standards and guidelines, which are incorporated by reference. The allotments fall within Forest Plan Management Areas G, I, L, R, and S where emphasis is on the following:

Management Area G - approximately 1% of the Llaves allotment is within this management area. Emphasis in this area is on key wildlife habitat protection, habitat improvement, and forage and firewood production. Recreational opportunities are dispersed and consist of firewood and piñon nut gathering, hunting, and recreational driving (USDA-FS 1987, pg 121). Standards and Guidelines related to range management include:

Allotment management planning will minimize the effects of gates and other range structures on recreational travel.

Protect known populations of grama grass cactus and manage to increase and recover population. Manage grazed lands to provide suitable habitat for re-introduction of grama grass cactus.

[3] Deferred-Rotation is any system, which provides for systematic rotation of grazing to achieve a specific management objective. A strategy aimed at providing time for plant reproduction, establishment of new plants, restoration of plant vigor, a return to environmental conditions apprpriate for grazing or the accumulation of forage for later use.

Grazing management should maintain or enhance woody shrubs and half shrubs such as winter fat and skunkbush for wildlife forage or cover (USDA-FS 1987, pg 122).

Management Area I - portions of Pollywog, Chiquito, Llaves, and Ojitos allotments fall within this management area, comprising a total of approximately 12% of the project area. Emphasis is on providing active management of cultural (heritage) resources including protection, stabilization, interpretation, evaluation, and opportunities for research. Use restrictions will be imposed as necessary to protect the cultural values (USDA-FS 1987, pg 135). Standards and Guidelines related to range management include:

Locate range structures to avoid the concentration of livestock on identified cultural resources (USDA-FS 1987, pg 137).

Management Area L - approximately 8% (within the Pollywog and Ojitos allotments) of project area falls within this management area. Emphasis is on providing semi-primitive non-motorized recreation opportunities. Wildlife, range, and fuels management may occur where consistent with this emphasis. These areas are closed to motorized travel and are identified as a roadless area in the *Forest Service Roadless Area Conservation Final Environmental Impact Statement Volume 2 – Maps of Inventories Roadless Areas* (USDA-FS 2000, pg 133). Standards and Guidelines related to range management include:

Emphasize use of native or natural materials such as local rock, logs, and indigenous plant species for structural projects or facilities (USDA-FS 1987, pg 147).

Management Area R - portions of all five allotments (approximately 68% of the total project area) fall within this management area. Cultural resource location, inventory, nomination, and protection are emphasized. The emphasis is also on wildlife habitat improvement and essential habitat protection and enhancement. Grazing and timber harvest occur where compatible with the primary emphasis of this area (USDA-FS 1987, pg 165).

Management Area S - the southern portion of the Gurule allotment lies within this management area, comprising 11% of the total project area. Cultural resource location, inventory, nomination, and protection are emphasized. Emphasis in this area is also on key wildlife habitat protection, habitat improvement, forage, and firewood production (USDA-FS 1987, pg 170). Standards and Guidelines related to range management include:

Grazing management should maintain or enhance woody shrubs and half shrubs such as winter fat and bitterbrush for wildlife forage or cover (USDA-FS 1987. pg 172).

1.5 Decision Framework

The District Ranger is the responsible official who will decide whether or not to continue to authorize livestock grazing on the Chiquito, Gurule, Llaves, Ojitos and/or Pollywog allotments and if so, under what terms.

1.6 Public Involvement

The proposed project was listed in the Santa Fe National Forest Schedule of Proposed Actions in November 2003 edition. This list is distributed to numerous individuals and can be accessed on the Santa Fe National Forest Website. A detailed project proposal was provided to 39 individuals, agency representatives, and interested tribes for comment during scoping in March 2004. Eight responses were received. Throughout the planning process, numerous meetings have been held with the allotment permittees. This project was also included on a list of proposed activities submitted to interested tribes.

Using the comments from the public and other agencies, an interdisciplinary team developed a list of issues to address.

In compliance with 36 CFR 215, a description of the proposed action, some possible alternatives, and anticipated effects were presented for a 30-day public comment period in June 2004. This Environmental Assessment was developed after considering comments received during the 30-day period.

1.7 Issues

The Forest Service interdisciplinary team grouped and sorted comments (both internal and external) received during the scoping period and 30-day comment period into issues and non-issues. Issues are defined as a concern or debate about the effects of the proposal. Issues were further categorized as key issues (used to develop alternatives to the proposed action) and other issues (addressed through mitigation measures common to all alternatives). The effects related to all issues are discussed in Section 3. Comments not considered issues to analyze in this EA were those:

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

1.7.1 Key Issues

No key issues were identified

1.7.2 Other Issues

Other issues were noted and are discussed below. Mitigation measures were developed to address these *other issues*. A list of non-issues and reasons regarding their categorization is in the project record (# 20).

- **Soil and Vegetation –** continued grazing may result in over utilization on some allotments, particularly in view of the on-going drought.
- **Water (riparian resources)** – water sources (earth tanks) and surrounding resources (vegetation and wildlife) can be adversely affected by grazing associated disturbances.
- **Wildlife** – construction activities associated with range improvements (noise and ground disturbance from use of heavy equipment) may disturb wildlife species during breeding season, resulting in unsuccessful reproduction.

- **Heritage Resources** – activities associated with grazing (trampling, bedding down, and congregating near salt, water developments, and corrals) have the potential to affect archaeological sites by damaging surface and sub-surface artifacts and features.
- **Economics** – range improvements can be costly to the government or to the permittee, or both.

2.0 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for management of the Chiquito, Gurule, Llaves, Ojitos, and Pollywog Range allotments. This section presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker. This chapter also identifies mitigation measures.

2.1 Alternatives Eliminated from Detailed Study

2.1.1 – Offer Fair Market Value for Permits

One permittee suggested the Forest Service offer permittees fair market value for current permits in lieu of canceling permits. This alternative was dropped because such an action is outside the scope of this analysis and is not within the decision authority of the deciding official. Buying out permits would require congressional legislation.

2.1.2 – Current Management

Under this alternative, there would be no change in current allotment management. The Forest Plan and respective allotment management plans would continue to guide grazing on the allotments. None of the proposed actions would be implemented. This alternative was dropped because it did not meet the purpose and need to authorize livestock grazing in a manner that moved toward forest plan objectives and desired conditions.

2.1.3 – Vegetative Treatments

A variety of vegetative treatments were suggested by permittees or presented in comment letters. They included prescribed burning, sage brush treatments, and chemical treatment of noxious plants. These alternatives were not developed because, with respect to cattle grazing, the allotments currently produce enough forage to support the proposed management scenarios and there is not a need to increase forage by conducting sage treatments and prescribed burning. Furthermore, such treatments are costly and minimal funding is anticipated in the foreseeable future[4]. With respect to chemical treatment of noxious weeds, the Santa Fe National Forest is currently addressing this issue in a forest wide Environmental Impact Statement.

2.1.4 – Range Facilities

Two comments provided suggestions regarding the construction or removal of specific range facilities. The deciding official determined that it would not be feasible to implement these suggestions within the foreseeable future.

2.1.5 – Permit Administration

A variety of suggestions were received that fall within the realm of grazing permit administration and not the decision to authorize grazing. One commenter suggested a 30-70% reduction in permitted grazing on all allotments, without providing site specific

[4] Nationally, priortization for vegetative treatments is in the wildland urban interface.

environmental information to support this action. Another commenter suggested increasing stocking levels to historic levels on the Ojitos allotment. One commenter suggested combining the five allotments into one or two allotments. These alternatives were dropped because the proposed action and preferred alternative provide management flexibility to respond to site specific situations that may require reductions or support increases in grazing permit authorizations. They also provide the flexibility to combine allotments for grazing management purposes within the approved season of use and range of AUMs for each allotment.

2.2 Alternatives Considered in Detail

2.2.1 Alternative 1 – No Grazing

Cattle grazing would no longer be authorized on these allotments. Grazing permittees would be required to remove all cattle from the allotment when their current term grazing permit expires. No new permits would be issued. All range facilities would revert to the Forest Service where they would be evaluated for wildlife, watershed, and soil protection needs. Allotment boundary fences would not be removed, as they would be needed to prevent excess use by livestock from adjacent active allotments. Pasture fences would be removed as appropriate.

Table 4. Permit Expiration Dates

Allotment	Last Permit Expires
Chiquito	2011
Gurule	2004
Llaves	2013
Ojitos	2011
Pollywog	2013

2.2.2 Alternative 2 – Proposed Action

This alternative would incorporate adaptive management strategies, allowing for yearly adjustments in season of use, number of authorized head, changes in grazing system based on range readiness, forage availability, utilization, and other factors that may affect range condition. The season of use for Chiquito allotment would be shortened by 45 days from current levels, thus reducing the AUMs available for grazing. The AUMs available for grazing on the Ojitos allotment would increase from current levels. One pasture on the Pollywog allotment would be divided into two. The Maps 2-6 display existing and proposed range facilities. Specific to range facilities, this alternative includes:

- Construction of an earthen stock water pond on Chiquito allotment
- Repair or replacement of a well on the Gurule allotment
- Construction of an earthen stock water pond on the Gurule allotment
- Removal of four miles of fence on Llaves allotment
- Construction of 0.5 mile new fence on Llaves allotment
- Construction of an earthen stock water pond on the Llaves allotment
- Construction of a new corral on the Ojitos allotment
- Reconstruction of an earthen stock water pond on the Ojitos allotment

- Construction of an earthen stock water pond on the Ojitos allotment
- Expansion of an existing earthen stock water pond on the Ojitos allotment
- Treatment of an existing population of musk thistle on the Ojitos allotment
- Construction of 1.75 mile new fence on Pollywog allotment
- Construction of eight erosion control dams on Pollywog allotment
- Construction of an earthen stock water pond on Pollywog allotment

Table 5. Proposed Action

	Chiquito	Gurule	Llaves	Ojitos	Pollywog
No. of Pastures	4	4	7	8	5
New Range Structures					
Earthen Tanks	1	1	1	3 (2 rebuilds)	1
Restoration Dams					8
Corrals				1	
Wells		1 (repair)			
Fences (miles)			-3.5		1.75
Grazing System	Deferred Rotation	Deferred Rotation	Deferred Rotation	Deferred Rotation	Deferred Rotation
Authorized AUM Range	450-850	450-850	800-1500	250-500	800-1500
Normal Season	5/15 – 11/30	5/1 – 11/15	5/1 – 12/31	5/1 – 11/30	5/1 – 12/31

2.2.3. Alternative 3 – Preferred Alternative

This alternative is similar to the Proposed Action, except for the following changes.

Chiquito Allotment - The AUMs authorized for this allotment may be reduced initially until the negative impacts to range conditions associated with unauthorized use are reversed. As the desired range conditions return, the number of authorized AUMs may be returned to current levels. The decisions on these adjustments will be based on monitoring results from this allotment. The watershed specialist has identified a need to construct four restoration dams in the Alamo pasture to address erosion in an existing arroyo.

Gurule Allotment - The grazing permittees have requested construction of a corral in the Middle Gurule pasture to aid in management of cattle.

Ojitos Allotment – A rest-rotation grazing system would be implemented. Additional increases in authorized AUMs on this allotment would become possible as additional acres reach satisfactory range management status. The decisions on these adjustments will be based on monitoring results from this allotment.

All Allotments – There is no specific time table for completing the facility work listed in this alternative. Work on individual facilities will only be initiated when such work will help move the range resources toward desired conditions. Monitoring data indicating resource responses to other changes in management (the number of permitted cattle, season of use, and total head months, rotation system, etc.) will be factored into decisions regarding whether or not to proceed with work on individual facilities. Work on individual facilities will then be initiated as funds become available.

Table 6. Preferred Alternative

	Chiquito	Gurule	Llaves	Ojitos	Pollywog
No. of Pastures	4	4	7	8	5
New Range Structures					
Earthen Tanks	1	1	1	3 (2 rebuilds)	1
Restoration Dams	4				8
Corrals		1		1	
Wells		1 (repair)			
Fences (miles)			-3.5		1.75
Grazing System	Deferred Rotation	Deferred Rotation	Deferred Rotation	Rest Rotation[5]	Deferred Rotation
Authorized AUM Range	450-1200	450-850	800-1500	250-950	800-1500
Normal Season	5/15 – 11/30	5/1 – 11/15	5/1 – 12/31	5/1 – 11/30	5/1 – 12/31

2.3 Mitigation and Monitoring Requirements

2.3.1 Mitigation Measures

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

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

- Cattle will not be moved onto an allotment or pasture until range readiness and facility inspections indicate that appropriate conditions exist.
- Early season grazing will not be permitted in pastures containing riparian vegetation, these include, the Bull pasture (Ojitos allotment) and the Llaves and Llaves Holding pastures (Llaves allotment).
- Key herbaceous riparian vegetation, will have a minimum stubble height of four inches on the stream bank, along the green line, after the growing season and during spring runoff;
- Key riparian browse vegetation will not be used at levels exceeding 50 percent of the current annual twig growth that is within reach of the animals;
- Key herbaceous riparian vegetation on riparian areas, other than the stream banks, will not be grazed more than 30 percent during the growing season or 60 percent during the dormant season; and
- Stream bank instability attributable to grazing livestock will be less than ten percent on a stream segment.

[5] Rest-Rotation is a grazing management scheme in which rest periods for individual pastures, paddocks or grazing units, generally for the full growing season, are incorporated into a grazing rotation.

- Upland range resource values will be protected from unacceptable grazing effects as determined through monitoring. Livestock grazing will be managed at a level corresponding to conservative intensity. Minimum acceptable stubble heights have been developed by the Forest Service for certain species. Residual plant material should not be reduced below those levels. Cattle will be moved when utilization of key forage species in key use areas approaches established standards.
- Salt will be placed so as to minimize impacts to riparian zones, meadow ecosystems, and other forest resources (USDA-FS 1987, pg 68). Salting locations will vary annually and will not be located within ½ mile of water sources.
- The Bull pasture (Ojitos allotment) will not be grazed until the proposed earthen tank is constructed and functioning.

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

- Construction and maintenance of range facilities will be evaluated and executed to have no adverse effect on threatened and endangered species (Forest Plan, pg 68). If any listed or proposed Threatened, Endangered, or Sensitive species are found during project activities, work in the immediate vicinity of the sighting will stop until a Forest Service wildlife biologist has resurveyed the area and any newly recommended mitigation measures have been implemented.
- Allotment fence management will meet wildlife standards that allow easy migration and passage, with fence height no more than 42 inches above ground and the bottom wire no less than 12 inches above ground. Fences and loose wires will be removed as they are abandoned (Forest Plan, pg 66 and 67).
- Non-game entrance and escape ramps will be provided on water developments intended for livestock and wildlife use (Forest Plan, pg 66). New and reconstructed livestock water developments will include wildlife access, cover, and escape considerations (Forest Plan, pg 67).
- Construction of improvements (such as corrals, tanks, fences) within potential northern goshawk habitat will not occur during nesting season (March 1 – September 30). However, if a goshawk survey is conducted and there is negative response, construction may occur during this period.

Heritage Resources – the objective is to protect heritage resources (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 concentrations of livestock on identified heritage resource sites. No ground disturbing activities will be conducted within known site boundaries.
- Restoration dams located along the arroyo on the Pollywog allotment will be located at least 50 meters from archaeological site AR-03-10-02-1787.
- 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 Service will monitor no less than two sites per allotment per year to assess the effects cattle may have on archaeological sites.

Recreation – the objective is to reduce encounters between recreation users and cattle and minimize impacts to scenic quality.

- Within Management Area L (portions of the Pollywog and Ojitos allotments), emphasize use of native or natural materials such as local rock, logs, and indigenous plant species for structural projects or facilities (Forest Plan, pg 147).

Economics – the objective is to evaluate the costs of facility work to the agency and the affected permittee(s).

- An economic and financial analysis will be completed for each facility development project prior to its initiation.

2.3.2 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.

Effectiveness monitoring will determine if grazing standards and guidelines, grazing prescriptions, and Allotment Management Plan practices are effective in accomplishing the planned objects.

Range readiness will be monitored before the grazing season begins, stubble heights may be measured during the grazing season and utilization will be monitored at the end of the season. 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. All key area locations identified by the Forest Service and the permittees need to be reconsidered using the following guidelines.

- They are between 0.25 and 1.00 mile from livestock water sources, on slopes less than 15%, 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.

Specific management goals (riparian areas, Endangered Species Act consultations, etc.) may require selection of monitoring locations that do not meet the previously listed criteria for a key area. The rationale behind selection of these critical areas should be documented.

Vegetation composition and trend will be monitored at five-year intervals. using benchmarks. Benchmarks are reference points that are sensitive to management changes.

Validation monitoring will determine if the stocking rates are appropriate by comparing actual use records and effectiveness monitoring results.

2.4 Comparison of Alternatives

This section compares the effects of implementing each alternative, to provide decision makers and the public a clear basis for choice. Table 7 summarizes the more detailed effects analysis descriptions contained in Section 3.0.

Table 7. Comparison of Alternatives

Purpose and Need	Alternative 1 No Grazing	Alternative 2 Proposal	Alternative 3 Preferred Alternative
Provide for management flexibility to respond to changing resource conditions while maintaining satisfactory range management status and distribution of cattle	N/A	Incorporating adaptive management, as well as constructing new pasture fence, constructing 5 new earth tanks, and repairing/expanding 2 existing tanks will provide for better distribution of cattle and allow for management discretion in periods of drought, fire, or other events. Repairing the well in the Gurule allotment will supply a reliable supply of water to the pipeline system, also allowing for better distribution of cattle. These factors will resulted in maintaining satisfactory range management status throughout the allotment.	This alternative provides more management flexibility. In addition to that listed for Alternative 2, this alternative does not include a specific time table for completing facility work; rather, work on individual facilities will only be initiated when such work will help move the range resources toward desired conditions based on the results of monitoring.

Purpose and Need	Alternative 1 No Grazing	Alternative 2 Proposal	Alternative 3 Preferred Alternative
Provide for soil retention and vegetation growth along eroding arroyos.	Downcutting of arroyos in Pollywog and Chiquito allotments will continue to affect soil retention and vegetative growth. Absence of grazing will allow for improved soil retention and vegetative growth in the vicinity of existing water developments.	Construction of eight restoration dams along arroyo in Pollywog allotment will improve soil retention and encourage vegetative growth. Erosion problems associated with an arroyo on the Chiquito allotment would not be addressed. Construction of an additional water development in the Chiquito allotment will relieve grazing pressure in the vicinity of the existing water development, improving soil retention and vegetative growth in the area.	Construction of 12 restoration dams (eight in Pollywog and four in Chiquito allotment) will improve soil retention and encourage vegetative growth. Construction of an additional water development in the Chiquito allotment will relieve grazing pressure in the vicinity of the existing water development, improving soil retention and vegetative growth in the area..
Control the spread of musk thistle	Musk thistle at the pond in the Lang pasture will not be treated under this decision.	The spread of musk thistle in Lang pasture will be controlled through hand treatment, until such time as additional treatment methods are available on the Santa Fe National Forest.	
Provide for unimpeded and safer wildlife travel.	Internal pasture fences will be removed as appropriate resulting in safer wildlife travel in all the allotments.	Four miles of old fence replaced by ½ mile of new fence will result in unimpeded and safer wildlife travel on the Llaves allotment.	

3.0 ENVIRONMENTAL CONSEQUENCES

This section describes the existing environmental conditions and the probable effects to the physical, biological, social and economic environment of implementing the proposed action and other alternatives. This analysis is organized by resource. Within each section, the affected environment is briefly described followed by the environmental consequences (effects) of implementing each alternative. The no grazing alternative provides a baseline for evaluation and comparison of the action alternatives.

3.1 Past, Present, and Reasonably Foreseeable Future Activities Used for Consideration of Cumulative Effects

Cumulative effects are the incremental and additive effects from other activities that add to the effects of the management alternatives analyzed in this Environmental Assessment. Past, present and reasonably foreseeable future activities and land uses within or in close proximity to the Chiquito, Gurule, Llaves, Ojitos, and Pollywog grazing allotments are briefly described here. Foreseeable future activities only include those that have been proposed for NEPA analysis in the near future or a NEPA decision has already approved implementation of the action. Other possible future actions were considered too speculative to include in the cumulative effects analysis.

Oil and Gas - there are 37 existing oil and gas developments within the five allotments: 1 well on the Llaves, 11 on Pollywog, 12 wells in Chiquito, 7 wells in Ojitos, and 6 wells on Gurule. The Santa Fe National Forest is preparing an Environmental Impact Statement for proposed Oil and Gas development in the San Juan Basin and a reasonably foreseeable development scenario would include the development of 10-20 additional wells in the next 20 years (Project Record #5). The Cuba District is currently analyzing (in an Environmental Assessment) the effects of authorizing the construction of a pipeline (less than one mile) proposed by the Benson-Montin-Greer Drilling Company.

Vegetation Management - private lands in the surrounding area have been grazed and farmed over the past decades. In the 1950s, some piñon/juniper stands were treated by chaining. In the 1960s, sage control treatments were conducted in various portions of the allotments. Treatments consisted of using a root plow with a 10 inch disc followed by seeding the area with crested wheatgrass using a seed drill. In the 1990s, sage brush areas within the allotments have been treated using prescribed burning. Timber management has not been high in the area, there have been limited small timber sales generally about 20 acres in size. Sage and piñon/juniper treatments have also occurred on adjacent private lands and timber harvest has occurred on adjacent Jicarilla Apache land (between 1998 and 2000).

Current and anticipated future projects related to vegetation management include the continuation of the sale and cutting of Christmas trees for personal use (approximately 50 trees may be cut in the area each year). Minimal collection of dead and down firewood through personal use fuelwood permits. A small timber salvage sale is being conducted in the BMG wildfire area (burned in 2002). Private land sage treatments are on-going and there is some wheat farming occurring on private lands as well. Invasive weeds have

been identified in several locations within the allotments and treatment of invasive weeds is anticipated in the future. Adjacent BLM land managers have also identified invasive weeds and have begun to treat them at some of the oil and gas wells and along access roads. Future meadow restoration is being proposed in the Pollywog and Gurule allotments off of Highway 112.

Recreation - there are no developed campgrounds in the area. The area within and surrounding these four allotments receives a low level of dispersed recreation use primarily related to spring and fall hunting seasons. Use is not expected to increase in future years and there are no plans for future campground development in the area.

Fire – up to 30 small acreage (less than one acre) fires are reported in the area every year. These fires are generally started by lightning. Over the past couple decades, only a few moderate size wildfires have occurred, they include: a 50 acre wildfire near Dural well in 1988, the 120 acre Sypher wildfire in 1990 (Ojitos allotment), the 40 acre Wolf fire in 1991, and the 400 acre BMG wildfire in 2002 (overlapping the Llaves and Pollywog allotments). Prescribed fire was used to treat sagebrush areas in the 1990s. The Mud Springs prescribed fire was burned in blocks between 1990 and 2000 – treating a total of about 7,000 acres. Prescribed burning in the Mud Springs area is anticipated to occur in the future for the purpose of maintaining the previously treated area.

Road Management – a railroad once ran through the area hauling timber to the El Vado saw mill. The railroad is no longer present, but portions of forest roads follow the old railroad grade. Today, paved highways and dirt roads access much of the allotment. Many of these roads access oil and gas developments. The Cuba Ranger District is in the process of conducting a roads analysis process as part of a Santa Fe National Forest forest-wide roads analysis. This process will identify necessary roads and maintenance levels as well as recommend some roads for administrative closure or decommissioning. It is anticipated that some roads will be closed in the area. No new roads are proposed for the future; however, with additional oil and gas development likely to occur, there may be a need for road construction to well pad sites.

3.2 Soil

3.2.1 Affected Environment

The five allotments are located along the eastern edge of the San Juan Basin. Data from the Terrestrial Ecosystem Survey of the Santa Fe National Forest (USDA-FS, 1993) was used to determine soil condition. Soil condition is normally evaluated by examining properties that reflect past and present soil function. The physical condition of surface soil, a zone of maximum biological activity, has an essential role in nutrient recycling, vegetative productivity and diversity, water storage and movement, and geomorphic stability.

A *satisfactory* soil condition rating indicates past and current management have allowed soil to function properly and retain its inherent productivity. An *impaired* soil condition rating indicates past and/or current conditions or management activities have reduced the soil's ability to function properly, biologically. Impaired soils have an annual soil loss in

excess of tolerance (equivalent to the depth of soil generated on an annual basis) but less than potential (the loss predicted to occur following a catastrophic wildfire). Causes of accelerated erosion can include disturbance of vegetative cover or surface soil by humans (such as with road use and maintenance), disturbance by livestock or wildlife, low to moderate severity wildfires, and/or natural factors (such as steep slopes, landslides, or extreme rainfall).

An *unsatisfactory* soil condition rating can indicate that management activities have resulted in a loss of soil function. Generally these areas have degraded so far that they are not likely to recover in a timely manner, even if rested from use, without substantial restoration measures. An unsatisfactory rating can also be based on geologic conditions, such as steep slopes that naturally result in poor soil formation and erosional conditions. Soil condition ratings for the five allotments are presented in Table 8.

Table 8. Soil Condition Rating – acres

	Chiquito	Gurule	Llaves	Ojitos	Pollywog
Satisfactory	7,400	5,554	7,484	14,881	17,761
Impaired	3,923	2,284	2,554	3,123	2,330
Unsatisfactory	446	405	736	367	358

About 77% of the soils are designated in satisfactory condition; 20% are considered impaired, and 3% are considered unsatisfactory. The impaired soils are generally concentrated in areas where sage treatments occurred in the 1960s and where these same areas were subsequently seeded with crested wheatgrass. These areas are currently showing an upward trend as grazing management has changed and native grasses have begun to return to the area. The one exception to this is an area identified in the Archuleta pasture of the Chiquito allotment where monitoring data over the past three years has shown overuse. The proposed action addresses the need to improve soil condition in this area. The unsatisfactory soils are generally found on steep slopes and are designated unsatisfactory due to geologic conditions rather than grazing.

3.2.2 Environmental Consequences

Alternative 1 – this alternative would have the least effect on soil within the five allotments because eventually (as permits expire) no cattle would be permitted in the area. Overall, however, there would be little change in soil condition because water developments would likely be retained and used by wildlife so there would continue to be limited localized disturbance to soil in the vicinity of the water sources. Additionally, the corrals would likely be retained for limited hunting use and as such, there would continue to be similar localized soil disturbance in these areas as well.

Alternative 2 – for the most part, impaired soils on the Gurule, Llaves, Ojitos, and Pollywog allotments would be expected to continue on an upward trend as native grasses continue to re-establish in previous sage treatment areas. Additionally, the proposed action identifies restoration activities along a drainage in the eastern portion of the Pollywog allotment, these activities would improve conditions in the area by stabilizing the downcutting currently occurring.

With respect to the Chiquito allotment, this alternative proposes a reduction in AUMs as well as construction of a water development in the Archuleta pasture for the purpose of relieving grazing pressure in the pasture. These actions would address the impaired soils that currently exhibit a downward trend in the Archuleta pasture. Relieving grazing pressure by increasing distribution (through construction of an additional earthen water tank) and decreasing the number of cattle and duration of use in the pasture through adaptive management would ultimately improve soil condition.

Existing Improvements - soil compaction resulting from cattle grazing can occur in localized areas surrounding spring developments, within corrals, and where cattle tend to trail along fence lines. Under this alternative, these localized effects would occur at existing developments. Two spring developments are located on the Pollywog, two on Chiquito, four on Llaves, one on Ojitos, and no spring developments are located on the Gurule allotment. In these cases, some soil compaction would be expected to occur in a small area (less than 1/10 acre) surrounding the drinker/trough – the actual springs are fenced to keep cattle out. Similar effects would be expected in the vicinity (less than an acre) of earth water tanks. There are 17 existing earth tanks on the Pollywog, ten on the Chiquito, seven on the Llaves, nine on the Ojitos, and 11 on the Gurule allotment. Compaction also occurs in the vicinity of and within the corrals (encompassing about ¼ acre around a corral). Two corrals are located on the Llaves allotment and one is located on the Gurule allotment. Compaction in these areas is limited because cattle are only in the vicinity of the corrals for a couple of days in May and a couple of days in November as well as incidental use in cases where a sick or injured cow may be treated. Generally, between the use in May and November, vegetation (consisting of perennial forbs and grasses) grows back in the area surrounding the corrals. On occasion, hunters will use the corrals during hunting season. The Cuba Range Staff has observed that trailing is not common along fence lines within these allotments because the fences have been in place for many years and cattle have become accustomed to fence locations. Thus, considering the existing corrals and water sources, soil compaction caused by cattle grazing would affect only about 0.1% of the soils in these allotments.

Proposed Improvements - this alternative proposes constructing five new earth water tanks (one in each allotment), expanding one existing earth water tank (Ojitos allotment), and re-establishing an existing, non-functioning earth tank (Ojitos allotment). Construction and subsequent use of these tanks will result in ground disturbance (less than one acre for each tank) at each tank location. The total amount of area disturbed however would be minimal and would be balanced with increasing distribution throughout the allotments, thus allowing for more even utilization of vegetation and reducing the potential for overuse in any given area.

Eight retention dams are proposed in an arroyo on the Pollywog allotment. These retention dams would result in short term ground disturbance during the construction phase, however, over the long term, their presence would deter downcutting in the arroyo, ultimately increasing soil retention and vegetative ground cover in the area.

One new corral will be constructed in the Ojitos allotment. Construction of the corral and subsequent use will result in localized ground disturbance. However, because the spatial extent of disturbance (about ¼ acre surrounding the corral) and duration of disturbance (a

few days in May and in November and infrequent use in the interim) is very limited, there would be no measurable change in overall soil condition within the Ojitos allotment resulting from this action.

Approximately 1.75 miles of fence is proposed in the Pollywog allotment and .5 miles of fence is proposed in the Llaves allotment. Construction of these fences will not result in a significant amount of soil disturbance, because the fence lines will be hand constructed. Also, it is anticipated that cattle will quickly become accustomed to the fence locations, limiting the effects of trailing along fence lines.

Alternative 3 – for the most part, the effects of this alternative would be the same as Alternative 2. The only changes affecting soils under this alternative would be related to the additional improvements. A new corral would be constructed in the Gurule allotment. Similar to the effects described in the previous alternative, the construction of this new corral and subsequent use will result in localized ground disturbance. However, because the spatial extent of disturbance (about ¼ acre surrounding the corral) and duration of disturbance (a few days in May and in November and infrequent use in the interim) is very limited, there would be no measurable change in overall soil condition within the Gurule allotment resulting from this action.

This alternative also proposes constructing four retention dams in an arroyo on the Chiquito allotment. These retention dams would result in short term ground disturbance during the construction phase, however, over the long term, their presence would deter downcutting in the arroyo, ultimately increasing soil retention and vegetative ground cover in the area.

Cumulative Effects – although soil disturbance and compaction is likely to occur in the vicinity of proposed oil and gas wells (10-20 new wells are anticipated in the next 20-years), this disturbance would likely be confined to well pad sites (approximately one acre at each location). While there is potential for soil disturbance associated with the construction of access roads to the oil and gas developments, these effects would likely be balanced by beneficial effects likely occur related to anticipated road closures (to be identified through the upcoming roads analysis process). Thus, the total area impacted by activities other than grazing development is likely to be minimal.

As described in the effects analysis for alternatives 2 and 3, little change is anticipated with respect to soil condition resulting from the continuation of grazing activities and very little localized change in soil condition (such as increase or decrease in compaction/trampling) is anticipated in the areas surrounding proposed range facilities. Therefore, no significant cumulative effects are anticiapted.

3.3 Water / Riparian

3.3.1 Affected Environment

The five allotments are within five 5th code watersheds: Rio Gallina (HUC 1302010204), Rio Nutrias-Rio Chama (HUC 1302010203), Rio Chama (HUM 1302010202), Tapacito Creek (HUC 1408010303), and Canada Larga (HUC 1408010302).

Table 9. 5th Code Watersheds Within Allotment

Allotment	5th Code Watershed	Acreage Within Allotment
Chiquito	Rio Gallinas	1,720
	Rio Nutrias-Rio Chama	10,080
Gurule	Rio Gallina	5,300
	Canada Larga	3,000
Llaves	Rio Gallinas	10,730
	Rio Nutrias-Rio Chama	60
Ojitos	Rio Gallinas	15,660
	Rio Nutrias-Rio Chama	60
	Rio Chama	190
	Tapacito Creek	2,670
Pollywog	Rio Gallinas	13,700
	Rio Nutrias-Rio Chama	6,740

Numerous ephemeral drainages and arroyos run throughout the allotments. However, very few perennial or intermittent streams exist within the allotments areas. Capulin Creek has its headwaters in the Pollywog allotment. It then runs south through the eastern half of the Llaves allotment until it meets the Rio Gallina immediately outside the southern boundary of the Llaves allotment. One other perennial stream within the allotments is an unnamed stream within the Ojitos allotment.

Two allotments, the Llaves and the Ojitos, support approximately 360 acres of riparian area, with around 280 acres within the Llaves and close to 80 acres within the Ojitos. Riparian areas are identified by using the Santa Fe National Forest's Terrestrial Ecosystem Survey to locate complexes of community types and/or subseries communities that meet the definition of riparian areas, specifically an area with a perennial stream, hydrophytic plants and hydric soil.

In July, 2003, a 50 year flood event occurred in Canada Ojitos (Ojitos allotment). Large boulders and vegetative debris were transported down canyon and portions of Forest Road 312 were washed out. The canyon bottom held and no severe downcutting occurred.

3.3.2 Environmental Consequences

Alternative 1 – this alternative would result in the most beneficial effects to riparian areas because, as permits expire, new permits would not be issued and eventually, there would be no cattle grazing in the 360 acres designated as riparian. As such, grazing would not contribute to cumulative effects to resources in riparian areas and a slight upward trend in the riparian area recovery would be expected.

Alternatives 2 and 3 – cattle grazing is anticipated to have little direct or indirect effect on riparian areas due to the implementation of mitigation measures combined with limiting authorized grazing to a short period of time within riparian pastures. These actions will facilitate riparian area recovery and recruitment of riparian dependent species. Under these alternatives, cattle would be permitted in the Llaves, Llaves Holding pastures (both on Llaves allotment), and the Bull pasture (Ojitos allotment) for an average of twelve, two to three, and fourteen days respectively. These three pastures

have small riparian corridors that would be accessible to the cattle during the short duration of their stay; however, these pastures will be monitored and no early season grazing (the woody vegetation will be completely leafed our before cattle are allow in the pasture) would be permitted. Furthermore, these pastures would be managed at a 20% utilization level. Specific to the Bull pasture, no grazing will be permitted until the proposed water development has been constructed and is ready for use, as it will be the only available water source in the pasture.

Cumulative Effects – very little direct and indirect effects are anticipated under the alternatives, as such, there are no anticipated cumulative effects.

3.4 Air

3.4.1 Affected Environment

The five allotments are within a Class II air quality management area that is in attainment of air quality requirements.

3.4.2 Environmental Consequences

None of the alternatives 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.

3.5 Vegetation

3.5.1 Affected Environment

Within the five allotments, elevations range between 8,977 feet above sea level at Gallina Peak to 7,000 feet above sea level in canyon bottoms and sagebrush flats. Vegetation is largely defined by elevation. Higher elevations exhibit a spruce dominant, mixed conifer forest that trends toward a ponderosa pine dominant forest as elevation decreases. Aspen stands are found along north facing slopes and in cool drainages. Piñon, juniper, and sage brush are present at lower elevations. Table 10 displays the general vegetation types that occur on the five allotments.

Table 10. Vegetation Type (percent of allotment)

	Chiquito	Gurule	Llaves	Ojitos	Pollywog
Riparian	0	0	1	<1	0
Piñon / juniper	28.2	49.8	42.5	34.2	16.5
Grassland	24.3	25.4	20.8	7.6	10.5
Oak Woodland	2.1	.4	1.8	2.3	1.5
Ponderosa Pine	39.3	20.8	31	36.5	48.2
Mixed Conifer	6	0	2.1	19.4	22.8
Badlands	.1	3.6	.8	<1	<1

In the 1950s and 1960s, portions of the allotments were treated by chaining piñon and juniper and in other areas, uprooting sagebrush and replanting with crested wheatgrass. Much of the range capability in the allotments is located along canyon bottoms and in flat

to moderate sloped ponderosa pine woodlands. In general, recent monitoring data shows use in key areas falls within 31-40% utilization.

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.

Table 11 displays acres of full, potential, and no capability on each allotment. Of the full capability areas, 15,184 (76%) acres are considered in satisfactory range management status and 4,803 (24%) acres are in unsatisfactory range management status. Elements of the proposed action were developed to address the unsatisfactory range. They include constructing improvements to improve distribution, implementing adaptive management to allow for changes in season of use and duration of use in a given area, and alleviating use in areas within the Archuleta pasture on the Chiquito allotment. Of the potential capability, 4,670 acres are considered satisfactory; however, use is not assigned to these areas as grazing is not likely to occur because of poor accessibility.

Table 11. Range Capability (Acres)

	Satisfactory	Unsatisfactory	Total
Chiquito			
Full Capability	1,391	1,945	**3,337**
Potential Capability	2,969	0	**2,969**
No Capability	N/A	N/A	**5,464**
Gurule			
Full Capability	2,710	294	**3,004**
Potential Capability	1,395	0	**1,395**
No Capability	N/A	N/A	**3,845**
Llaves			
Full Capability	4,484	249	**4,733**
Potential Capability	0	0	**0**
No Capability	N/A	N/A	**6,040**
Ojitos			
Full Capability	2,457	487	**2,944**
Potential Capability	83	0	**83**
No Capability	N/A	N/A	**15,345**
Pollywog			
Full Capability	4,142	1,828	**5,970**
Potential Capability	223	0	**223**
No Capability	N/A	N/A	**14,256**

The following invasive plants occur within the allotments. The Santa Fe and Carson National Forests are jointly conducting a NEPA analysis and have issued a Draft Environmental Impact Statement for the treatment and control of invasive plants.

Musk thistle – this species occurs in light concentrations throughout the allotments, generally in the vicinity of existing roads. There is one area of moderate concentration; on the Ojitos allotment in the vicinity of Broken Tank pond (Section 16). This particular occurrence is confined to the pond area, its spread potential is considered moderate due to it being located in a main channel bottom and adjacent to a moderately used road. It is proposed that this area be treated by clipping seed heads and grubbing first year plants before they produce a thistle. This treatment has been effective in other places on the District in slowing the rate spread.

Diffuse Knapweed – this species has been observed on the Llaves allotment along Forest Road 507 near Deadman's lookout. Its occurrence is mainly confined to less than one acre along the road. In general, the potential for this species to spread is considered moderate due to the general characteristics of the plant; however, for this particular occurrence, the spread potential is low due to annual hand grubbing.

Spotted Knapweed – this species has been observed on the Llaves allotment in a one acre area along Forest Road 6. Similar to the diffuse knapweed, this population is treated on annually basis by hand grubbing, as such, the potential for spread is considered low.

Canada thistle – this species has been observed on all the allotments. The larger populations are on the Llaves allotment near the junction of Forest Roads 6 and 7. Its occurrence is mainly confined to the road side. Potential for spread is considered moderate to high due to its location along the road corridor. No active treatment is

occurring because this species thrives on disturbance and the best way to control spread is through chemical application – the effects of which have not been analyzed.

Salt Cedar – Salt cedar has been reported in low occurrences on the Llaves and Pollywog allotments in the Chupadero and Lleguas drainages. Spread potential is high due to the characteristics of the plant.

Bull Thistle - occurs throughout the allotment in disturbed logging areas. Generally in low concentration and the spread potential is considered low.

Russian Knapweed - this species has not been reported on forest lands within the allotments, but it is present along State Highway 112 and on private lands adjacent to the allotments. This species has a moderate spread potential and as such, may spread onto the allotments.

3.5.2 Environmental Consequences

Alternative 1 – as permits expire, cattle would be removed from the allotments. Eventually, understory vegetation would no longer be grazed by cattle but would continue to be grazed by deer and elk. Because much of the spread of invasive species within the allotments occur adjacent to roads and dispersed recreation sites, eliminating cattle grazing would not likely reduce the spread or rate of spread of these plants. Removing cattle as permits expire would not affect overstory vegetation. The majority of vegetation within these allotments is designated as mixed conifer and ponderosa pine. As such, removing cattle would not convert these lands to a different type of vegetation.

Alternatives 2 and 3– with the exception of proposing to hand treat the musk thistle located on the Ojitos allotment and continued hand grubbing of diffuse and spotted knapweed, no additional weed treatments (or other vegetative management activities) are proposed, as such, there would be no change to the vegetative structure within the allotments. There would be very little change in capability resulting from the construction of new facilities; rather, the facility construction would improve distribution of cattle within full capability areas. By improving distribution and incorporating adaptive management, vegetative conditions in capable areas currently designated as being in unsatisfactory range management status would improve through implementation of mitigations and elements of the proposed action. These actions include, constructing water developments and pasture fences to improve cattle distribution, implementing adaptive management to allow for changes in season of use and duration of use in a given area, and alleviating heavy cattle use in areas within the Archuleta pasture on the Chiquito allotment.

Cumulative Effects – because there would be no change to overstory vegetation under any of the alternatives, there would be no cumulative effects to overstory vegetation. No significant changes to general understory vegetation are expected. However, there may be minimal improvement to understory vegetation resulting from better distribution of cattle (through construction of new pasture fences and water developments) and this combined with other proposed management activities (such as alleviating grazing pressure in the Archuleta pasture of the Chiquito allotment) and past activities (including

recent BMG wildfire resulting in a flush of new grass growth) will result in continued preservation of understory vegetation.

3.6 Wildlife

3.6.1 Affected Environment

General Wildlife - The varied environment consisting of steep hog back ridges, canyons, and sagebrush flats within the five allotments provides habitat for a variety of wildlife species. Smaller species include skunks, raccoons, small rodents, squirrels, rabbits, and coyotes as well as a variety of game and non-game bird species such as songbirds, turkey, hawks, and owls. Larger species include bobcat, mountain lion, deer, elk, and bear. Most wildlife inhabit the area from late spring through the fall. The area contains limited winter habitat and many species leave the area during winter months when high snow accumulations and cold temperatures drive them to lower elevations. Overall, population levels for all wildlife species are considered stable.

Approximately 80 acres of riparian vegetation occurs on the Ojitos allotment and 280 acres on the Llaves allotment. These areas are primarily associated with arroyos and dry washes, which can receive large amounts of water during heavy rainfall events. Although water associated with these riparian areas is limited, the walls of the arroyos and dry washes can provide nesting cavities for some species, including rock wren, American kestrel, and barn owl.

Threatened, Endangered, and Sensitive Species - Endangered Species Act listed/proposed threatened and endangered species and habitats are very limited or do not occur on the allotments. **Bald eagle**, **Rio Grande silvery minnow**, and **Holy Ghost Ipomopsis** do not occur in the area, nor does habitat exist for these species.

Table 12. Threatened, Endangered, Sensitive Species

Species	Status	Habitat Present
Bald eagle *haliaeetus leucocephalus*	Threatened	No breeding habitat present; transient roosting or foraging possible
Mexican spotted owl *Strix occidentalis lucida*	Threatened	One PAC overlapping portion of Chiquito allotment; possible foraging / roosting habitat
Peregrine falcon *Falco peregrinus anatum*	Sensitive	No designated suitable breeding habitat; possible foraging / roosting habitat
Northern goshawk Accipiter gentiles	Sensitive	Suitable habitat for this species has been identified on the Chiquito allotment; potential foraging / nesting habitat also is present

There is documented habitat within the project area for the **Mexican spotted owl** (threatened). This species is also identified as a management indicator species on the forest. The Golondrino PAC (protected activity center) overlaps approximately 30 acres on the eastern most boundary of the Chiquito allotment. Grazing does not occur in this portion of the allotment due to steep slopes. The majority of the PAC lies outside the current analysis area. A survey conducted in 2003 did not detect the presence of Mexican

spotted owls (MSO) within the PAC. Proposed critical habitat[6] for MSO has been identified on approximately 22,600 acres overlapping four of the allotments (Pollywog, Chiquito, Llaves, and Ojitos). Of this these acres, approximately 80% fall within areas designated as having no capacity for cattle grazing.

A review of the Regional Forester's Sensitive Species List (USDA-FS, 1999) indicates the following sensitive species occur or are likely to occur within the five allotments. Species not addressed in detail are not present within the five allotments, nor is habitat present for the species.

- **Peregrine falcon** – a falcon sensitive zone has been identified within the Llaves and Pollywog allotments and in the past, peregrine falcons have been known to occupy the area. There is potential for other areas of the allotments to also provide suitable habitat[7]. Suitable nesting sites for falcons occur on tall sheer rock cliffs, which average 200-300 feet high. Recent monitoring of these locations did not detect any falcons using the area; however, a golden eagle nest with one downy golden eagle nestling was observed on a low south-facing cliff. No falcons were observed to be breeding in the area on recent surveys.
- **Northern goshawk** – a goshawk nest site is located on the Chiquito allotment. This species is a generalist that uses a wide variety of forest stages and preys on large to medium size birds and mammals, which it captures on the ground. Goshawks nest in older-aged stands that have a high density of large trees, high tree canopy cover and high basal areas, while more open areas are used for foraging. In general, areas that provide habitat for goshawk are forested slopes which provide very little forage for cattle. Surveys associated with the recent BMG wildfire salvage sale in the Pollywog allotment did not detect a presence of this species. Suitable habitat has been identified on the Chiquito allotment; however, recent surveys have not been conducted to determine occupancy.

Management Indicator Species - Management indicator species are designated in the Santa Fe National Forest Plan (USDA-FS, 1987). The Santa Fe National Forest has completed a Management Indicator Species analysis (USDA-FS, 2003). Forest wide population and habitat descriptions and trends for each Management Indicator Species are described in that document. **Mexican spotted owl** has been previously discussed. **Rocky Mountain bighorn sheep** and **Rio Grande cutthroat trout** are not present, nor does suitable habitat exist within the allotments for these species. Habitat does occur within the allotments for the following management indicator species:

- **Merriam's turkey** – turkey habitat is common throughout the forest; encompassing about 1.3 million acres (USDA-FS, 2003) the allotments provide spring-summer habitat for turkeys; winter use in the area is limited. Turkeys prefer to roost 20-30 feet off the ground in tall mature or over-mature ponderosa pine within ½ mile of water. They forage in these same areas as well as in grasslands and brush communities. Their population trend in New Mexico is

[6] Critical habitat refers to specific geographic areas that are essential for the conservation of a threatened or endangered species. These areas may require special management considerations. However, a critical habitat designation does not set up a preserve or a refuge and only applies to situations where federal funding, authorization or permits are involved. Additionally, not all areas identified as proposed critical habitat contain habitat elements important to the owl.

[7] Both goshawk and falcon analysis are based on habitat suitability, where all suitable habitat is treated as occupied unless proven otherwise by completing surveys.

considered stable to increasing. Turkey are considered secure-common within the lower elevations of the allotments.

- **Hairy woodpecker** – woodpecker habitat is common throughout the forest; encompassing about 976,000 acres. Population is ranked as abundant for the Santa Fe National Forest (10,000 to 100,000 pair). Surveys conducted by the USGS between 1968 and 1998 indicate a stable or increasing trend for hairy woodpecker statewide (USDA-FS, 2003). Woodpeckers prefer areas containing large snags and downed woody debris. They prefer to nest in tall trees averaging 17 inches in diameter and 60 feet high and forage in the same type of trees (USDA-FS, 2003). Portions of the five allotments are within ponderosa pine and mixed conifer vegetation types, and habitat for woodpecker is present. The 400+ acre BMG wildfire burned in 2002 (overlapping portions of the Llaves and Pollywog allotments), creating snags that may be desirable for woodpeckers. These combined with other existing snags attract a variety of insects for woodpeckers to eat.
- **Rocky Mountain elk** – elk habitat is common on the forest; encompassing 1.6 million acres (USDA-FS, 2003). The trend for elk habitat on the forest is rated as stable and the population trend is ranked as increasing on the Forest. Elk inhabit most forest types that contain good forage and cover. Elk migrate through the five allotments when moving between summer and winter range. The allotments fall within hunt Unit 5b, which is one of six units in the larger Chama-Tres Piedras area. Population estimates for the six units has decreased from a high of 12,500 in 1997 to 9,200 in 2002. The target population for elk in this area is 9,100. Elk primarily use the area in the summer and fall. While no winter range has been identified in the allotments, during mild winter conditions elk remain in areas of low snow accumulation.
- **Mourning dove** – mourning dove habitat is common throughout the forest; encompassing about 990,000 acres. The habitat trend for the mourning dove is considered stable to increasing across the forest. They are found in most forest types, with nearby meadows serving as the best habitat. Within the allotments mourning doves would be expected to be present spring through fall.
- **Piñon jay** – piñon jay habitat occurs on approximately 465,000 acres of the Santa Fe National Forest. The species mainly nests in open woodlands such as stands of piñon/juniper; this type of habitat occurs in the lower elevation areas of the allotments. The pinon jay needs open woodlands for nesting and an adequate supply of seeds, especially nuts. The habitat trend for pinon jay is ranked as stable on the forest. Surveys conducted by the USGS between 1968 and 1998 indicate a stable or downward population trend for pinon jay within the state of New Mexico. Population is ranked as common on the Santa Fe National Forest but few are expected to occur on these allotments due to lack of habitat.

Migratory Birds –

New Mexico Partners in Flight lists priority species of concern by vegetation type. The allotments contain Great Basin desert shrub, piñon/juniper, ponderosa pine, and mixed conifer zones described in the Partners in Flight priority website. The following priority birds could occur in the allotment.

Table 13. Vegetation Zones and Priority Birds

Great Basin Desert Shrub	Piñon and Juniper	Ponderosa Pine	Mixed Conifer
Gambel's quail Costa's hummingbird Northern beardless-tyrannulet Black-tailed gnatcatcher Bendire's thrasher Crissal thrasher Varied bunting Scott's oriole	Ferruginous hawk Gray flycatcher Gray vireo Bendire's thrasher Black-throated gray warbler	Northern goshawk Mexican spotted owl Flammulated owl Greater Pewee Olive warbler Virginia's warbler Grace's warbler	Northern goshawk Mexican spotted owl Williamson's sapsucker Olive-sided flycatcher Dusky flycatcher Red-faced warbler

The closest proposed IBA (important bird area) is Golendrino Mesa, located adjacent to the eastern boundary of the Chiquito and Llaves allotments, little grazing occurs in this area due to steep slopes and inaccessible terrain. The Chama River Gorge from El Vado to the north end of Abiquiui Reservoir is located approximately five miles east of the allotments and the Caja del Rio / Santa Fe River Canyon IBA is located > 50 miles away. Associations or important links between the bird communities within these allotments and the two IBAs (or any other IBA) would be within the ponderosa pine and mixed conifer forest type where birds feed on insects found on the foliage of ponderosa pine trees and snags represent an important habitat component.

Overwintering areas generally consist of large wetlands. Important overwintering areas recognized on the Santa Fe National Forest include the Rio Chama and the Rio Grande corridors; the Rio Chama is located five miles east of the allotments. The area encompassed by the allotments is not recognized as an important overwintering area because significant concentrations of birds do not occur there nor do unique or a high diversity of birds winter there.

3.6.2 Environmental Consequences

Alternative 1 – as permits expire, eliminating grazing is not anticipated to negatively affect any wildlife species. There would likely be both beneficial direct and indirect effects of no grazing to various species due to the increase in ground vegetation, which could result in an increase of cover for small mammals and insects, and ultimately an increase of prey for predatory species. Elimination of grazing would also result in a decrease of associated noise and visual disturbances.

Alternatives 2 and 3

General Effects Applicable To All Species - the five allotments as well as the surrounding forested lands contain substantial summer range for wildlife. Operations such as tending to livestock (herding or transporting), maintaining or constructing range facilities (fences, corrals, water tanks), and to some degree the presence of cattle, can create sound and visual disturbances. Visual and sound stimuli associated with human and livestock presence may cause localized and relatively short-term effects, particularly during breeding season. These disturbances are generally limited to ¼ mile of the ongoing activity. Beyond ¼ mile, disturbances associated with livestock operations and grazing are less likely to occur because vegetation, typography, and wind provide a screening or

buffering affect to sound and visual disturbances, as such, sound disturbance associated with allotment activities is anticipated to be minimal.

Riparian areas are important to many species. Specific to these allotments, riparian vegetation is limited. Approximately 80 acres of riparian vegetation is present on the Ojitos allotment (Bull pasture) and 280 acres on the Llaves (Llaves and Llaves holding pastures). No riparian areas have been identified on the other three allotments. Limited grazing occurs in existing riparian areas. The Bull pasture is grazed fourteen days, the Llaves for twelve, and the Llaves holding for two to three days per season. Because these pastures are grazed for short duration combined with mitigation measures that limit utilization and prohibit early season grazing, it is anticipated that there would be little affect to wildlife species dependent on these riparian area resources.

Threatened, Endangered, and Sensitive Species - livestock grazing within these allotments would have no effect on the **bald eagle** because no known breeding habitat occurs and bald eagle presence in the allotment is infrequent.

Cattle grazing would have no effect on the **Mexican spotted owl** or **proposed critical habitat**. This determination meets the criteria designated in the USDA guidance criteria (USDA-FS, 2004) for a no effect determination, and is based on the following:

- As recently as 2003, surveys have confirmed the PAC overlapping 30 acres of the Chiquito allotment is not occupied.
- Past surveys (multiple surveys in 1991 and 1995) also resulted in no detection of Mexican spotted owl in this PAC.
- Cattle grazing does not occur within the PAC due to steep, inaccessible slopes, and no range improvements are proposed in the PAC, thus there would no associated construction disturbance.
- Areas identified as restricted habitat (mixed conifer and riparian areas, and slope in excess of 40% outside a designated PAC) are not considered capable for cattle grazing.
- Primary constituents of proposed critical habitat include large diameter trees, moderate to high canopy closure, uneven-age stands, multi-layered canopy, high snag basal area, high volumes of down, woody debris, and high species richness. None of the proposed improvements would alter tree densities, snags, down woody debris, or other elements of proposed critical habitat. Also, as stated previously, 80% of the proposed critical habitat is designated as having no capacity for cattle grazing – as such, cattle grazing does not occur.
- Where grazing does occur in proposed critical habitat (less than 20% of the total proposed critical habitat), mitigation measures and monitoring will ensure use does not exceed established utilization standards.

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

- **Peregrine Falcon –** habitat occurs in open country and cliff areas characterized by steep, inaccessible sheer faces, generally exceeding 200 feet in height and adjacent to water. Suitable cliff habitat exists in the Pollywog allotment, however, water is a limiting factor. Recent monitoring (conducted by raptor specialist, T. Johnson and District Biologist, personnel communication 2004) of

these cliff locations did not detect falcons using the area. No improvements are proposed within the suitable falcon habitat area. Thus, should falcons use the area in the future, little effect associated with permitted cattle grazing is anticipated. The construction of five new water tanks proposed under Alternative 2 and 3 could slightly increase prey species by attracting them to the water source.

- **Northern goshawk –** goshawks typically nest in larger/taller trees and cattle grazing through an area would not be likely to create a disturbance to nest sites. Also, goshawks are predators of forest birds and mammals and none of the alternatives propose changing tree density, which is important habitat for goshawk prey species (e.g. tree squirrels, large woodpeckers, and blue grouse). While permittee activity (movement, noise and construction) can disturb nesting hawks, this effect is expected to be low due to the mitigation measure requiring construction activities within potential habitat be conducted outside of breeding season. Non-construction type activities would be of short-duration and would likely not have a negative affect on nesting. The construction of five new water tanks proposed under Alternative 2 and 3 could slightly increase prey species by attracting them to the water source.

Management Indicator Species - grazing under these alternatives is not likely to have a negative impact on the overall population trends for:

- **Merriam's turkey** –turkeys prefer to roost in tall ponderosa pine and none of the action alternatives propose changing the tree density. Adding water developments under Alternatives 2 and 3 would provide additional water sources for the turkey. The proposed grazing activities would not influence the population status or trend for this species on the Santa Fe National Forest.
- **Hairy woodpecker –**woodpeckers nest and forage primarily in the high in canopy of large diameter trees and none of the action alternatives propose changing the tree density.
- **Rocky Mountain elk** – overall, elk populations on the Santa Fe National Forest are stable to increasing. There is no recent documented or anecdotal evidence that cattle grazing is adversely affecting elk on these allotments and there is no evidence of competition between cattle and elk for forage. Actions proposed under Alternatives 2 and 3 would benefit elk because cattle would be better distributed and there would be less concentration of cattle in a given area that could lead to competition for forage. Distribution and forage availability for elk would be further enhanced by developing water sources that could be used by elk as well as cattle. Removal of four miles of old fence and constructing new, short segments of fence to meet wildlife standards (mitigation measure) would allow for elk migration and passage to occur.
- **Mourning dove** - morning doves primarily nest in trees 10-25 feet off the ground and none of the actions proposed would change tree density. The potential for loss of nests due to abandonment from disturbance associated with grazing would not likely be measurable above the normal population fluctuations that occur from year to year.
- **Piñon jay** - while grazing can impact individual nests and young present in small trees, the proposed activities are not expected to have negative impacts on the overall population trends for piñon jays in the analysis area.

Migratory Birds - no significant effects to migratory bird species or IBAs are anticipated because improvements or changes in management are not expected to alter their habitat. The proposed activities will not result in removal of overstory vegetation, therefore snag retention standards and guidelines in the forest plan will be met. Furthermore, the area encompassed by the allotments is not recognized as an important overwintering area.

While noise and disturbance impacts to individual birds from grazing associated activities could occur, this impact would be considered minimal and would not be expected to cause declines in overall species population because very little cattle grazing occurs in the eastern portion of the Chiquito and Llaves allotment that borders the Golendrino Mesa IBA. Proposed water developments may provide a slight beneficial effect as they would provide water, sources of mud for nest building, and insects for food.

Cumulative Effects - direct and indirect effects of implementing any of the proposed actions are expected to be very minimal; as such they are not expected to result in significant cumulative effects to any wildlife species. Projects such as the construction of new oil and gas wells and associated access roads would have potential to add temporary noise and visual disturbance; however, being located in areas already heavily developed with respect to oil and gas wells, wildlife are likely already accustomed to disturbances in these areas. Over the long term, improvements in the grazing systems on the five allotments would result in better distribution of cattle combined with increased understory vegetation that would be expected to continue following the BMG wildfire.

3.7 Heritage Resources

3.7.1 Affected Environment

Approximately 38% of the area encompassed by the five allotments has been previously surveyed. Some of the previous surveys were conducted prior to 1985, and do not meet current survey standards for the Santa Fe National Forest with respect to transect spacing and qualifications of individuals performing the survey. However, these older surveys did result in documentation of archaeological sites and the surveys provide valuable and relevant information related to the types of sites and density of sites that would be expected in the area.

Table 14. Previous Survey and Recorded Sites by Allotment

Allotment	Total Survey	Survey Meeting Standards	Mgmt Area I[8]	Sites Recorded	Sites Listed on National Register of Historic Places
Chiquito	22%	2%	13%	120	Rattle Snake Ridge (Hormigas Site) – this site consists of the remains of a large dispersed community with towers, numerous surface rooms, pithouses, a reservoir, and granaries stretching more than a ½ mile along a ridge. The site was excavated by UNM between 1947 and 1949. There have been no reports of cattle damaging the site.
Gurule	19%	7%	0%	45	none
Llaves	82%	11%	.01%	195	none
Ojitos	27%	6%	12%	288	none
Pollywog	42%	10%	21%	322	Nogales Cliff House – this site is a well-preserved cliff dwelling consisting of 20-25 multi-level rooms constructed of adobe. The site was excavated by UNM in 1939. The site is inaccessible to cattle because of its location in a cliff along a steep canyon wall.

As displayed in the previous table, the five allotments are located in an area with high site density. The majority of the 970 recorded sites are believed to be associated with the Gallina cultural occupation of the area which occurred between A.D. 1050 and A.D. 1275. No local, modern day Native American groups identify the Gallina as their direct ancestors. The Gallina culture period appears to have been dominated by warfare, which is evident in their preference for constructing habitation sites in defensive positions (along cliffs and narrow hogback ridges) as well as in evidence of intentional burning and destruction of numerous house sites throughout the area.

Gallina sites are characterized by a great variability in architecture. They can include pit structures, storage structures, towers, cliff dwellings, above ground masonry rooms and roomblocks, and jacal structures. Sites can be found in high valleys, on mesa tops, along hog back ridges, and along steep cliff faces. Often the sites are located in defensive positions that afford excellent views of the surrounding countryside.

While the vast majority of sites in the area date to the Gallina occupation, there are a few historic sites located within the five allotments. These sites generally consist of small historic trash dumps and remnants of the railroad bed, as well as a few historic structures (corral, mine, lookout tower).

Although there are a high number of sites within the five allotments, there have been no reported situations where cattle were congregating on archaeological sites or trampling artifacts and there are no known standing prehistoric ruins that are currently at risk of damage by cattle within the five allotments. This may be due in part to the location of sites. Gallina sites are generally located in steep, rugged topographic locations, not along canyon bottoms and flat lands where cattle prefer to congregate.

[8] Within Management Area I, forest plan emphasis is on providing active management of cultural (heritage) resources including protection, stabilization, interpretation, evaluation, and opportunities for research. Use restrictions will be imposed as necessary to protect the cultural values (USDA-FS 1987, pg 135).

3.7.2 Environmental Consequences

Alternative 1 - as permits expire, cattle will be removed from the five allotments and eventually, there would be no potential effects resulting from cattle grazing to archaeological resource within these allotments.

Alternatives 2 and 3
General Effects Associated with Cattle Grazing - continuing to permit cattle grazing would likely not have a significant effect on sites. However, because the entire 72,890 acres of the allotments have not been intensively surveyed, it is possible for unrecorded archaeological sites to be present and damaged by cattle. The possibility of cattle damage to sites is considered low due to the location of most sites within the five allotments on steep ridges away from canyon bottoms and other flat lands where cattle tend to congregate. In addition, known prehistoric sites in these allotments are mostly deflated and do not have standing walls or other features that would be affected by cattle rubbing up against them or knocking them down.

It is reasonable to predict that unrecorded prehistoric sites would also be sites located mostly on ridges without standing walls. Furthermore, should a prehistoric site with standing walls be present in an area where cattle congregate (near a corral, water development, salting area) it would likely have been reported by forest personnel or permittees, as such sites are not common to the area.

There may be some minimal surface damage (from trampling) to unrecorded artifact scatters in areas where cattle congregate. Trampling can result in breaking surface artifacts. This type of damage can result in a loss of scientific information. The potential for this effect to occur, however, is considered low, as several mitigation measures were developed with the objective of protecting heritage resources from direct or indirect impacts caused by general cattle grazing and by ground disturbing activities associated with the construction and maintenance of range facilities. Implementing mitigation measures will provide protection to archaeological sites within the allotments. Mitigation measures include: locating range structures in areas away from known sites so as to avoid concentration of livestock on identified heritage resources, no ground disturbing activities will be conducted within known site boundaries, and no salting will occur within or immediately adjacent to known site boundaries.

Effect Specific to Construction of Proposed Improvements

Chiquito Allotment – one earthen tank is proposed under Alternative 2 and four restoration dams are proposed under Alternative 3. A survey of these proposed developments was conducted in April and May 2004. No archaeological sites were documented in the vicinity of the proposed improvements, as such, no effects to archaeological sites are anticipated.

Gurule Allotment – within this allotment, one earthen tank is proposed under Alternative 2 and a new corral is proposed under Alternative 3. A survey of these developments was conducted in April 2004. No archaeological sites were identified at

the proposed construction locations, as such, no effects to archaeological sites are anticipated related to these improvements.

Llaves Allotment – one earthen tank and ½ mile of fence construction are proposed on this allotment. A survey of these developments was conducted in April 2004. No archaeological sites were identified at the proposed construction locations, as such, no effects to archaeological sites are anticipated related to these improvements.

Ojitos Allotment – three earthen tanks (one new and two expanded/re-established) and one corral are proposed on this allotment. A survey of these developments was conducted in April 2004. No archaeological sites were identified at the proposed construction locations, as such, no effects to archaeological sites are anticipated related to these improvements.

Pollywog Allotment – one earthen tank, eight restoration dams, and 1.75 miles of fence are proposed. A survey of these developments was conducted in April 2004. No sites or isolated occurrences were identified in the vicinity of the proposed fence and earthen tank. One archaeological site was recorded while surveying the area proposed for the eight restoration dams. The site was marked to ensure avoidance from all ground disturbing activities associated with construction of the restoration dams and a mitigation measure was developed that requires the restoration dams to be located at least 50 meters from the site boundary. With the implementation of this mitigation measure, no effects to archaeological sites are anticipated.

Cumulative Effects – based on the discussion provided above, no significant direct or indirect effects are anticipated related to known archaeological sites. There is a low potential for direct or indirect effects to occur on sites that have not been discovered. As such, no past, present or foreseeable future projects would have a cumulative effect on archaeological sites within these allotments.

3.8 Recreation and Scenery

3.8.1 Affected Environment

Recreation use is very low in the area and generally associated with hunting activities. There are no developed campgrounds or popular dispersed recreation sites in the area. There are two locally known archaeological sites within the allotments that receive day use, generally on weekends during the summer.

Approximately 8% (within the Pollywog and Ojitos allotments) of allotments fall within Forest Plan Management Area L where the emphasis is on providing semi-primitive non-motorized recreation opportunities. Range management (as well as other activities) may occur where consistent with this emphasis. This area is closed to motorized travel and identified as a roadless area in the *Forest Service Roadless Area Conservation Final Environmental Impact Statement Volume 2 – Maps of Inventories Roadless Areas* (USDA-FS 2000, pg 133).

3.8.2 Environmental Consequences

Alternative 1 – as permits expire, cattle would be removed from the area and there would be no potential for cattle/human conflict. Where appropriate, corrals would be retained and used for equestrian use during hunting season.

Alternatives 2 and 3 – because there is little recreation use in the area – continuing to allow cattle grazing would not affect recreation. No roads or improvements are proposed within Management Area L (roadless) and as such there will be no affect to the roadless character or values of the area. Should any improvements be proposed in the future (over the life of the permit), a mitigation is in place that would lesson the visual impact of such an activity. The mitigation would place emphasis on using native or natural materials such as local rock, logs, and indigenous plant species for structural projects or facilities (USDA-FS 1987, pg 147).

Cumulative Effects – because there are no anticipated effects to recreation from grazing, there would be no cumulative effects.

3.9 Environmental Justice

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

3.9.1 Affected Environment

The rural community of Cuba lies to the south of these grazing allotments and numerous small, predominantly Spanish communities as well as Native American pueblos and communities are located in the vicinity of the Jemez Mountains. Native Americans have been present in the area for the past 800 years and the Spanish first arrived in the area about 400 years ago. Many families in the area trace their ancestry back to these original inhabitants. As such, there are strong ties to the land and a reliance on the natural resources of the forest.

3.9.2 Environmental Consequences

Alternative 1 – this alternative would impact minority and low-income populations. Eliminating the opportunity to graze cattle on any or all of the allotments would adversely affect local permittees by changing traditional use of the land and causing an economic hardship to those individuals who rely wholly or in part on the income generated from their long-term cattle operations.

Alternatives 2 and 3 – selection of these alternatives would not result in adverse or disproportionate effects on low income or minority populations. These alternatives are consistent with activities implemented on National Forest lands throughout the United States over the past several decades. As such, the environmental effects are predictable as are the outcomes of implementing mitigation measures that have been refined over the years. There would be no displacement of minorities, changes of land use, or increases in taxes that would constitute an economic hardship. There would be no negative effects on public health.

4.0 CONSULTATION AND COORDINATION

In March 2004, the Forest Service sent a scoping letter to 39 interested or potentially affected people, groups, organizations, tribes, and state and other federal agencies during the planning process. A complete list of people and organizations consulted with during project scoping is in the project analysis file. Responses were received from six individuals or organizations.

Scoping Responses – Letters Received

Cora Gomez
Georgi Davis McCauley
David Strip and Elaine Gorham
John Y. Hernandez
Billy Stern (Forest Guardians)
Susan MacMullin (US Fish and Wildlife Service)

In June 2004, a pre-decisional Environmental Assessment was sent to interested parties for an official 30-day comment period. In accordance with 36 CFR 215, a description of the proposed action was presented. Possible alternatives and anticipated effects were also included. Five responses were received during the 30-day comment period. No late responses were submitted.

Comments Received during 30-day comment period

David Strip and Elaine Gorham
John Y. Hernandez
Billy Stern (Forest Guardians)
Gedi Cibas (New Mexico Environment Department)
Lorene Willis (Jicarilla Apache Nation)

This Environmental Assessment includes minor changes and clarifications based on substantive comments identified during the 30-day comment period.

4.1 List of Key Preparers

Table 15. Key Preparers

Rita Skinner	Team Leader – Writer/Editor, NEPA coordinator
Jim Eaton	Range, Vegetation, and Soil; GIS
Jennifer Boyd	Heritage Resources
Ramon Borrego	Wildlife
Erica Nevins	Hydrology

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