



United States
Department of
Agriculture

Forest
Service

Southwestern
Region



Livestock Grazing Management on the Jawbone Allotment

Tres Piedras Ranger District Carson National Forest



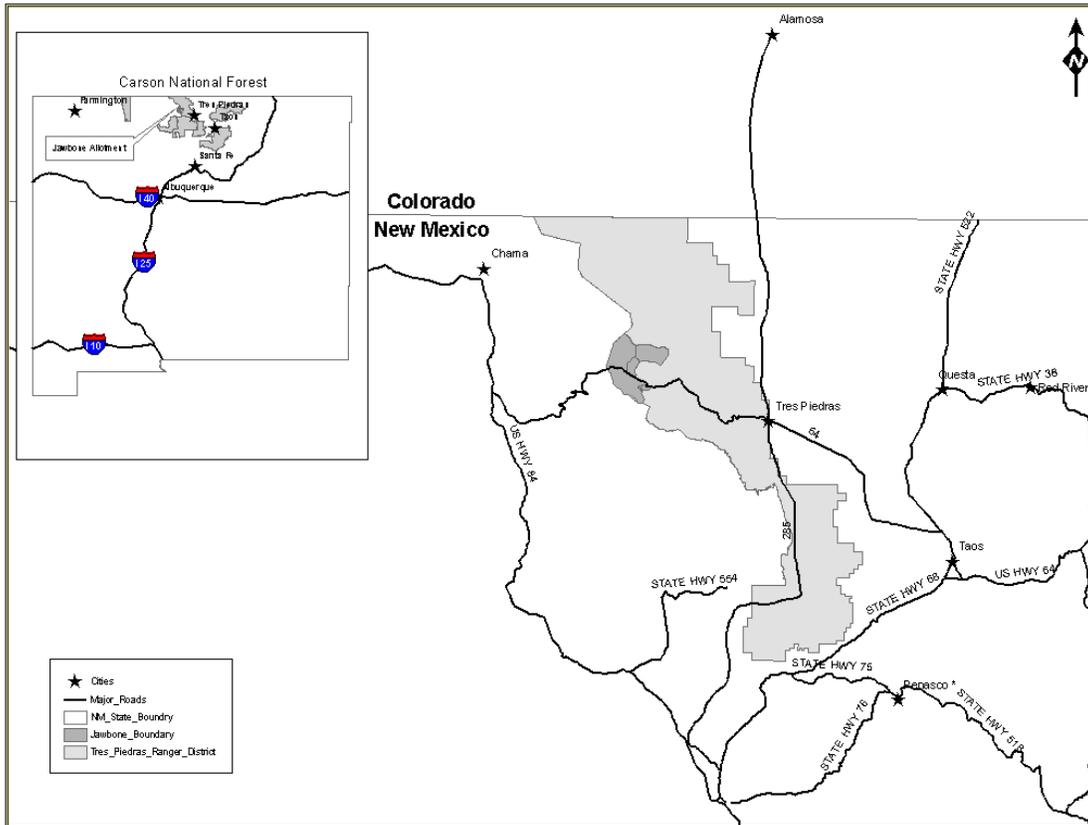


Figure 1. Project Vicinity Map

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Chapter 1 – Purpose and Need

This environmental assessment (EA) is being prepared to analyze the effects of re-authorizing livestock grazing on the Jawbone allotment, on the Tres Piedras Ranger District, Carson National Forest. An interdisciplinary analysis on the proposed action is documented in a project record. An index for the project record is presented in appendix A. Source documents from the project record are referenced throughout this environmental assessment by showing the document number in brackets [#]. This analysis is consistent with the Carson National Forest Land and Resource Management Plan (hereby forest plan), as amended and was developed in consideration of the best available science. [5]

Background

The Jawbone Grazing Allotment is located approximately 15 miles west of the community of Tres Piedras in northern New Mexico. A primary access is from US Highway 64 (see figure 1).

The allotment is 18,468 acres in size and has three fenced pastures (Hopewell, La Manga and Brokeoff) and one unfenced area (Gavilan). Allotment grazing capacity was calculated and indicates that of the total acreage, approximately 84 percent (15,509 acres) has grazable (full and potential¹) acres.

The allotment has five permittees (three individual cattle permits and two individual sheep permits): (1) 330 cow/calf from June 15 to September 30 (107 days), (2) 720 ewe/lamb from July 1 to September 30 (92 days) and, (3) 556 ewe/lamb from July 1 to September 15 (77 days). On an annual basis, numbers may be adjusted to respond to resource conditions.

The Gavilan area and the La Manga pastures are in fair condition, the Brokeoff pasture is in good condition and the Hopewell pasture is in fair to good condition. Some factors that are influencing condition and trend are: (1) fluctuations in seasonal and annual precipitation, (2) past periods of low precipitation and/or drought, (3) the increase in “invader” species that influence potential forage production, (4) the fair to poor condition of private/forest boundary fences and, (5) wild ungulate use. Due to its high elevation, the allotment has a relatively short growing season and the limited number of pastures reduces management flexibility (makes it more difficult to rest pastures). Over the course of 5 years, there have been modifications made to respond to resource conditions. Since 2002, reductions have averaged 17 percent annually.

Information Clarification

In the scoping letter and the follow-up request for comments (30-day notice and comment period), the term AUM (animal unit month) in addition to numbers of cow/calf units was consistently used to describe livestock allocations. The use of the AUM term was causing confusion; therefore, this term has been removed from the EA (with one exception) and only the

¹ There are 10,202 acres of full capacity acres. Full capacity grazable acres means the forage is on slopes ranging from 0 to 15 percent and 15 to 40 percent (accessible by livestock), there is available water, sufficient ground cover, and soil stability. There are 5,298 acres of potential capacity acres. Potential capacity acres means there may be steep slopes (40 to 80 percent), impaired soil stability, a lack of water, a lack of access, or insufficient ground cover. If the vegetation is treated or managed, it may (in the future) provide full capacity forage (USDA Forest Service 1997).

numbers of permitted livestock (expressed as cow/calf and bulls) is used. Grazing capacity, existing and proposed livestock numbers remain unchanged from this change in terminology. The AUM term is still used in the “Alternatives Considered but Eliminated from Detailed Study” section.

Purpose and Need for Action

Livestock grazing on National Forest System lands has contributed to the local economy and the stability of northern New Mexico communities for decades. On the Jawbone allotment, there is a need for forage availability to support domestic livestock and contribute to the economic diversity and social well being of surrounding communities that depend on range resources for their livelihood and/or as a food source.

The allotment’s riparian vegetation, found along perennial streams and intermittent creeks and drainages provides water and a key habitat component for wildlife species. Placer Creek, Rio Vallecitos and Little Tusas support populations of Forest Service sensitive species such as Rio Grande chub or Rio Grande suckers. In addition, the perennial streams support resident trout and macroinvertebrates (forest management indicator species). To support these species, the desired condition is to have properly functioning stream habitat (e.g., suitable temperature, sediment and streambank conditions). The desired conditions for riparian habitats is to have a mix of native woody and herbaceous plants that provide shade, stabilize the streambanks and limit the amount of sediment that reaches the stream. Regeneration of riparian shrubs, such as willows, is also an important component of these systems. Healthy plants of various age classes, good to excellent range condition and conservative grazing utilization (20 to 40 percent) provides food and cover for insects and small rodents that are forage for the federally listed Mexican spotted owl and the northern goshawk (Forest Service sensitive species).

The desired condition is to maintain and/or improve the (frequency) density and diversity (composition) of forage species. It is important to maintain a mix of palatable native cool season grasses (e.g., Thurber fescue, Arizona fescue) and forbs that provide both diversity and density of species while providing for soil stability. In order to provide more reliable forage for both livestock and wildlife and to protect soil and water resources, there is a need to maintain and/or increase plant diversity and density in the high elevation grasslands of the allotment.

Proposed Action

The Forest Service proposes to authorize continued livestock grazing on the Jawbone allotment. The proposed action is designed to maintain or improve resource conditions in rangeland health, riparian vegetation, soil and water conditions relative to livestock grazing. Some grazing practices would be changed to resolve resource issues.² The proposed action also includes additional adaptive management actions to be taken if resource conditions do not move toward desired conditions in an acceptable timeframe. Adaptive management considers other factors that contribute to resource conditions such as (but not limited to) periods of low precipitation and other natural events that are outside the control of the Forest Service. Table 1 provides details on

² Grazing management is administered through annual operation instructions (AOI). The AOI is made part of the term grazing permit and is the instrument for the implementation of specific management actions on an annual basis to achieve resource management objectives.

the use of an adaptive management plan that is part of this proposed action. Components of the proposed action are as follows:

This alternative would authorize both cattle and sheep. There would be 330 cow/calf from June 16 to September 30 (107 days). There would be two sheep permits: (1) 720 ewe/lamb from July 1 to September 30 (92 days) and, (2) 556 ewe/lamb from 7/1 to 9/15 (77 days). On an annual basis, numbers may be adjusted to respond to resource conditions. Grazing would occur through a deferred or rest rotational system to allow for cool season grass production in alternating seasons. The Gavilan area acreage would become part of the La Manga pasture. A conservative grazing intensity with an allowable utilization range of 20 to 40 percent, depending on the vegetation type and current range conditions would be used. To improve riparian area management, riparian areas would be identified by pasture, a pattern of use map would be established to document ungulate use and the annual operating instructions (AOI) would include salting for cattle/sheep at least 1/2 mile from key watering points. Management actions such as moving livestock out of riparian areas, reducing cow/sheep numbers and salting would become part of the AOI and allotment management plan.

Table 1. Adaptive Management Plan

Pasture / Location	Desired Condition	Monitoring Measure	Trigger Indicating Additional Action Is Needed	Possible Grazing Management Actions, If Trigger Indicates Need
Riparian Areas	<p>All riparian areas: Diverse riparian plant communities (60% of woody plant composition in 3 or more riparian species) provide overhanging vegetation and effective ground cover (not more than 10% bare ground within the riparian area). This helps trap sediment and dissipate energy during peak flows, protect soils from erosion processes, maintain stream bank stability and provide wildlife habitat. Plant species include sedges, rushes, desirable riparian grasses (e.g. timothy, brome), woody shrubs (e.g., willows, elderberry) and trees (e.g., aspen, alder). At least 60% of the woody plant composition includes 3 or more riparian species (Forest Plan, MA 14).</p> <p>Stream bank cover is increasing as new shrubs are established and improving desired riparian conditions. Desired riparian conditions provide quality aquatic habitat for other resident trout and aquatic macroinvertebrates (forest management indicator species). Quality riparian habitat for Mexican spotted owl (federally listed species) and Forest Service sensitive species is present (see Riparian Forest Sensitive Species section).</p>	1) Diversity of grassland plant community-% of plant composition in cool season grasses within a timeframe	1) Given adequate (near normal) climate conditions, cannot meet at least 75% of plant composition in cool season grasses by year 4 and 5	<p>*Increase herd management to control the amount of time livestock spent in riparian areas</p> <p>*Move livestock out of riparian areas on a daily basis to control the amount of time spent in these areas</p> <p>*Salt away from riparian areas to improve distribution in less used areas of the pasture</p> <p>*Reduce livestock numbers in order to move towards riparian desired conditions (<i>stocking rates consider 6 and 12 month standard precipitation index (SPI)</i>)</p> <p>*Eliminate livestock use within pastures to meet riparian desired conditions</p>
		2) % woody species within a time frame	2) <15% woody species in 5 years	
		3) % bare ground	3) > 10 to 15% bare ground in year 3	
		4) % utilization at the end of the summer from wildlife and livestock	4) >40% utilization for 2 consecutive years within a 5-year period (<i>Monitor utilization throughout the grazing period</i>)	
		5) Residual stubble height in inches of riparian vegetation within a time frame	5) Does not meet at least 4" residual stubble height of riparian vegetation annually(<i>Monitor residual stubble height at the end of the growing season</i>)	
		6) % of fine sediment in riffle habitat	6) % of sediment is moving towards exceeding 20% measured at 2 year intervals (2 nd , 4 th , 6 th and 8 th year).	
		7) Stream temperature	7) Temperature is increasing and does not comply with State of NM standard for cold water	

Pasture / Location	Desired Condition	Monitoring Measure	Trigger Indicating Additional Action Is Needed	Possible Grazing Management Actions, If Trigger Indicates Need
			fisheries measured in 2 year intervals (2 nd , 4 th , 6 th , 8 th year)	
Grasslands and upland meadows for key MSO habitat (Brokeoff pasture)	Maintain and/or achieve good conditions (and strive for moving from good to excellent in Mexican spotted owl habitat (Forest Plan Amendment #11) in 10 years. Diverse grassland communities and montane meadows provide abundant forage for all ungulates, especially in the late-spring and early summer. In high elevation grasslands, a mix of palatable cool season grasses (e.g., Thurber fescue, Arizona fescue and junegrass) and forbs dominate the plant community. There is some evidence of woody species (e.g., willow, elderberry, red osier dogwood). Cool season grasses that are healthy and reproducing emerge in the spring and offer nutritious forage for wildlife and livestock early in the growing season. Grasslands and montane meadows provide effective ground cover. In TEU 133E, bare ground is being reduced over time. In the remainder of the grasslands and meadows, there is between 5% and 20% bare ground (depending on soil type) to maintain soil stability and provide quality wildlife habitat. Wildlife, especially elk, (a forest management indicator species) utilize this habitat during the winter and spring. Grasslands and montane meadows also provide foraging habitat for Mexican spotted owl and northern goshawk prey base species.	<p>1) Diversity of grassland plant community-70% plant composition in cool season grasses within a timeframe</p> <p>2) % woody species in TEU 133E within a time frame</p> <p>3) % bare ground in TEU 133E and remaining key areas</p> <p>4) % utilization at the end of the summer from wildlife and livestock</p>	<p>8) % of unstable banks is moving toward exceeding 10% estimated in 2 year intervals (2nd, 4th, 6th and 8th)</p> <p>1) Cannot meet between 30% and 73% plant composition in cool season grasses by year 3, 4 and 5</p> <p>2) >15% woody species in TEU 133E by year 3, 4 and 5</p> <p>3a) >11% to 15% bare ground in TEU 133E by year 5 and, 3b) >5% to 20% in remaining key areas by year 3, 4 and 5</p> <p>4) >40% utilization in 2 consecutive years within a 5-year period (<i>Monitor utilization throughout the grazing period</i>)</p>	<p>*Delay livestock entry, to allow cool season grasses additional time for root growth, the formation of basal buds and the production of seed and food storage</p> <p>*Remove livestock from the allotment at an earlier exit date to maintain native food and cover for wildlife species (that depend on grasses and forbs for the winter)</p> <p>*Reduce livestock numbers in high elevation grasslands and montane meadows, to allow for growth</p> <p>*Use prescribed fire to reduce woody plant species (<i>Additional environmental analysis is required to implement this action</i>)</p>

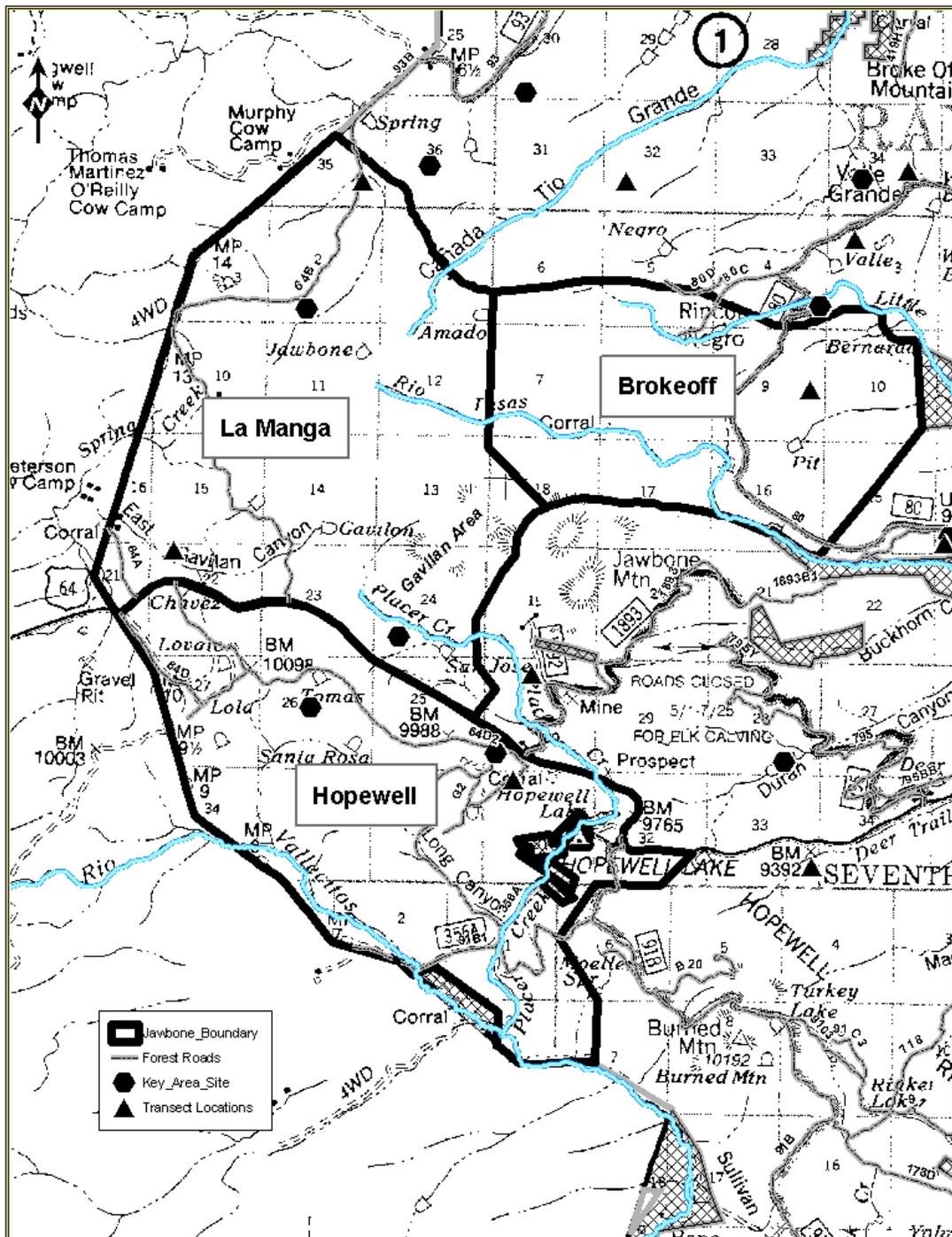


Figure 2. Jawbone Allotment Proposed Action

Forest Plan Consistency

The analysis area is within several Carson Forest Plan Management Areas (MA) which includes MA 1, 3, 4, 9, and 14. [5] The purpose and need for the proposed action focuses on maintaining and/or moving towards the desired conditions for 2 key management areas, riparian (MA 14) and high elevation grasslands (MA 9). For riparian, the purpose and need was developed from forest plan direction (Forest Plan, MA 14, pp. 1-2). To support these species, the desired condition is to have properly functioning stream habitat (e.g., suitable temperature, sediment and streambank

conditions). The desired conditions for riparian habitats is also to have a mix of native woody and herbaceous plants that provide shade, stable streambanks and serve to limit the amount of sediment that reaches the stream. Regeneration of riparian shrubs (such as willows) is also an important component of these systems. The proposed action includes measures to maintain or move towards these desired conditions (scoping letter, pp. 1-5). [29] For high elevation grasslands (MA 9), the proposed action addresses the need for modifying grazing management in order to maintain and/or move the allotment towards good condition and a stable to upward long-term trend. It includes actions to maintain or increase plant diversity and density in the high elevation grasslands (scoping letter, pp. 1-8). This proposal is consistent with the goals and objectives outlined in the forest plan, and would help move the allotment towards the desired conditions described in the plan. [5]

Decision Framework

Given the purpose and need, the District Ranger (Responsible Official) for the Tres Piedras Ranger District will: (1) Determine whether sheep and cattle grazing will be authorized on all, part, or none of the Jawbone allotment, and, (2) If the decision is to authorize some level of grazing, identify what management criteria will be applied (including standards, guidelines, grazing management system and monitoring) and incorporated in the allotment management plan (to ensure desired condition objectives are met or that movement toward those objectives occurs in an acceptable timeframe).

Public Involvement

The proposed action has been listed in the quarterly Carson National Forest NEPA Schedule of Proposed Actions since October, 2006. [12] As part of rangeland management consultation requirements (FSH 2209.13.90), the district and the permittees met on February 27, 2008, to discuss draft proposals. [26, 28] Two permittees provided comments prior to the scoping period (see project record). On May 21, 2008, the proposal was provided to the public, permit holders and other agencies. Three letters were received. [34, 36, 37] The comments included the following concerns and opinions:

- The proposal should include what percentage of forage is being consumed by elk. Elk are present before and after livestock use the allotment. If elk were better managed, permittees could go onto the forest with full numbers.
- The proposal needs to include relocating the north Tusas/Jawbone Brokeoff boundary fence. Tusas allotment livestock can access the Jawbone allotment. Because of privately maintained fences, private livestock use the Jawbone allotment and allotment livestock access the private land. The property owner needs to repair and maintain their fences.
- The proposal needs to include repairing stock ponds and springs.
- The proposal should include vegetation treatments in the La Manga pasture to promote grass and vegetation treatments should be conducted in aspen to improve forest health and wildlife habitat.
- The proposal should use weather conditions when considering resource recommendations.
- The proposal should include a clear on-date for cattle. For a high elevation allotment, an on date of July 15th would allow for re-growth and seed production for identified cool

- The proposal should explain what the permitted numbers are based on and what are the issues surrounding these numbers. How the size/class of livestock has changed (relative to forage consumption) needs to be included and built into the preferred alternative.
- The proposal should indicate which perennial streams is part of the analysis. The upper Vallecitos, Tusas Creek and Little Tusas (Rincon Negro) should be monitored for properly functioning condition with regards to riparian zones and livestock. The loss of quality cold water fisheries is the main issue.
- The allowable use guide in the forest plan needs to be applied. Two pastures need to be managed not to exceed 25 percent utilization or 30 percent if rest rotation is implemented.
- The proposal should include a reduction in the permitted numbers of cattle authorized on the allotment.
- The proposal should establish cover frequency monitoring sites for key use areas as opposed to using the established Parker transects.
- The proposal should include the ability to convert sheep permits to cattle permits.

30-day Notice and Comment Period

On July 9 2008, a request for comments was mailed to (61) individuals, organizations, permit holders and other agencies. Information included the purpose and need for action, public involvement (including issues that resulted from scoping) and alternatives. A legal notice regarding the 30-day notice and comment period was published in the *Taos News* on July 10, 2008. Four letters and two responses submitted via e-mail were received. Western Watershed requested clarification on how utilization is measured (see chapter 3, pp. 23-24), how many years of monitoring data is used for this analysis (see chapter 3, pp. 23-24) and where are key areas located (see figure 2). [46] The Bureau of Land Management (BLM) requested survey information on Ripley's milkvetch when it becomes available. The BLM also noted that the use of fire may be needed to improve vegetation conditions (see chapter 2, pp. 13-14). [37] The New Mexico Environment Department stated that Best Management Practices (BMPs) should be used to protect riparian areas along the Rio Vallecitos (temperature impaired) and the Rio Tusas to ensure that cool water fisheries and macroinvertebrate habitat is maintained (see chapter 3, pp. 33-36). The Navajo Nation stated the project would not impact traditional cultural properties or historical properties. Four permittees also provided comments. The permittees questioned the allotment's condition and trend monitoring data (see chapter 3, pp. 23-26). There was a concern that elk which compete for forage with livestock were not being adequately addressed. The permittees noted that poor boundary fence conditions that result in trespass livestock are adding to the overall utilization. There were questions regarding the desired conditions in the forest plan, particularly for riparian. Overall, the permittees felt that the goal was to eliminate grazing rights or reduce them to a point that operations are not viable. This concern was included in the significant issues and is analyzed in the social/economics section. However, no concern or comment resulted in the development of a new alternative. Most concerns and requests for clarification have been addressed in chapter 1 and in chapter 3. All public comments and our responses to these comments can be viewed on the forest website at: www.fs.fed.us/r3/carson/plans/nepa/jawbone_allotment.

Issues

Comments received during scoping and the 30-day notice and comment period were examined for significant issues. The Forest Service separates the issues into two groups: significant issues and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, forest plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council for Environmental Quality (CEQ) NEPA regulations require the following delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." Some comments received were requests for additional information or were general comments or opinions. A list of issues from scoping comments and reasons regarding their categorization as non-significant may be found in the project record. [35, 49]

Among the topics raised during scoping, the Forest Service identified the following significant issues:

Significant Issue #1: Mule deer, elk and black bear early season nutritional needs. Use an entry date of July 15th for cattle in this high elevation allotment to assure recovery of cool season grasses which are one of the main nutritional needs for mule deer, elk and black bear.

Response: In alternative 2, there would not be cattle entry prior to July 15th in two of three pastures, annually (please note, sheep would continue to enter the allotment around June 30th). Therefore, each year one of three pastures meets your recommendation. This would allow one of three pastures to have a cool season growth period with no cattle to provide for big game nutritional needs. The following year, a different pasture would be used for cattle entry. Rangeland grazing policy allows for grazing during the cool season growth period as long as range readiness criteria are met. If range readiness criteria are met (which means that grazing occurs after the plant is headed out to seed set for most cool season grasses), the need for big game nutritional values is met. Impacts to cool season grasses (from both sheep and cattle) will be an indicator of this effect and will be analyzed in the rangeland vegetation report. The indicator for the impacts to wildlife will be pasture condition and trend in terms of impact to plants during the cool season growth period.

Significant Issue #2: Loss of Quality Cold Water Fisheries. The upper Vallecitos, Tusas Creek and Little Tusas (Rincon Negro) should be monitored for properly functioning condition with regards to riparian zones and livestock. The loss of quality cold water fisheries is the main issue.

Response: Alternative 2 addresses this issue. Impacts to aquatic habitat and fisheries (percent sediment, stream temperature, percent streambank stability) will be analyzed in the fisheries report. Stream habitat surveys will be completed for these three perennials streams to gather baseline information.

Significant Issue #3: Implementation of Adaptive Management. Management actions moving livestock out of riparian areas daily need to be part of the preferred alternative for reauthorization. Waiting until a trigger (threshold) occurs is condoning current management and disregards any monitoring efforts.

Response: Alternative 2 addresses this issue. The proposal has been modified to clarify that these adaptive management actions would be in place in year one. Impacts to riparian habitat (in terms of percent plant community diversity, percent woody species, percent bare ground and percent utilization) will be an indicator of this effect and will be analyzed in the soils and water report.

Significant Issue #4: There should be a reduction in cattle numbers to improve resource conditions. The proposal should include a reduction in the permitted numbers of cattle authorized on the allotment to maintain and/or achieve good range conditions and improve riparian plant communities.

Response: We believe that this issue is addressed in alternative 2, by modifying how cattle and sheep use the allotment. Some of the pasture conditions are a result of not following the deferred rotation schedule. Over the course of 5 years, there have been modifications made to respond to resource conditions. Since 2002, there has been up to a 28 percent reduction in permitted cow/calf numbers. This would continue through the AOI. However, the proposal has been modified to indicate that annual reductions are likely to continue until conditions improve. The rangeland vegetation report will analyze how ungulates affect range condition and trend. The indicators vegetation composition (plant diversity), frequency (occurrence of perennial forage plants along a transect line and percent of bare ground) and vigor (the average maximum leaf length on important desirable species measured on available decreaser and increaser specie). The soils and watershed report will analyze the effects of cattle and sheep numbers to riparian conditions. The indicators for riparian condition are percent plant composition for cool season grasses, frequency, vigor, percent woody species, percent utilization and riparian stubble heights.

Significant Issue #5: Conversion of sheep permits to cattle permits. Jawbone permittees have been interested in a possible conversion of permitted sheep to cattle. In the past, permittees were temporarily authorized converted classes of livestock based on permitted head months. In order to analyze the environmental consequences associated with converting sheep permits to cattle (or cattle permits to sheep), alternative 3 was developed. The rangeland vegetation indicators are pasture/allotment condition and trend which is measured with vegetation composition, frequency and vigor. The soils and watershed report will analyze the effects to riparian from the two options for livestock conversion. The indicators for riparian condition are percent plant composition for cool season grasses, percent woody species, percent utilization and riparian stubble heights.

Significant Issue #6: Social and Economic Impacts: The proposed changes will not only have a negative economic impact, but it will also affect the quality of life for those that depend on grazing rights for human survival. It will affect a historic and culturally sensitive practice that has been passed down for generations.

Response: In alternative 2, the cow/calf and sheep numbers are the same as on the existing term permit. However, based on resource conditions and weather, the AOI would continue to determine the annual stocking rate. The indicator will be a qualitative discussion on impacts to quality of life, tradition and culture. The economic indicator will be the potential change in gross revenues as a result of annual reductions (based on actual use since 2000).

Chapter 2 – Alternatives

This section describes and compares the alternatives that will be considered for livestock grazing management on the Jawbone allotment.

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by the National Environmental Policy Act (NEPA) to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the need for maintaining or improving resource conditions in rangeland health, riparian vegetation, soil and water conditions relative to livestock grazing. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

An Alternative that uses the Carson Forest Plan Allowable Use Guide for Utilization Thresholds

Due to a court injunction (*Arizona Cattle Growers' Association v. Towns*, CIV No. 97-1868 PHX RCB) the Southwestern Region Regional Forester issued direction on June 5, 2000, terminating any use the "Allowable Use Guide (Percent) by Range Condition and Management Strategy" that is found in the Record of Decision for Amendment of Forest Plans for Arizona and New Mexico (USDA Forest Service, 1996, p. 94). The direction from the Regional Forester concludes, "In sum, the forage utilization table contained in the 1996 ROD may no longer be used to manage livestock grazing under pre-amendment permits. Please note that implementation and enforcement of the Court's injunction must be consistent throughout the Region and that therefore, the only allowable interpretation of the injunction is the interpretation contained in this letter." Although the allowable use guide is no longer in place, we are managing for light (20 percent) to conservative utilization (up to 40 percent) per FSM 2209.13, chapter 90, p. 12. Managing for light to conservative utilization translates into light being between 0 and 30 percent and conservative being between 31 and 40 percent.

An Alternative that Includes Fence Realignment between Allotments

The interdisciplinary team originally had fence re-alignment between the Jawbone and Tusas allotment in the proposal. However, at the meetings held this spring with permittees, both the Jawbone and Tusas allotment permittees indicated they wanted to work together on coming up with the alignment. This project may be added to the forest's Schedule of Proposed Actions (SOPA) in the future. However, it was eliminated from this analysis due to insufficient information on the proposed fence location.

An Alternative to Improve Forest Health and Wildlife Habitat

The suggestion to regenerate aspen and to improve the condition of grasses in the La Manga pasture was considered but eliminated from further analysis. There was insufficient vegetation stand data available. In addition, we did not have 2 years of survey data for Mexican spotted owl and northern goshawk that is needed for vegetation treatments. However, we do foresee future large, landscape type treatments to improve forest health. In addition, a forest plan amendment

for fire use is scheduled for this coming year. Once this in place, it may provide an opportunity (the term may be used because we need to evaluate where allowing natural ignitions to burn is appropriate and where suppression is the most appropriate management response) for improving habitat (improve grasses and forbs) and regenerating aspen.

An Alternative that Reduces Base Stocking Rates to Reflect Size/Class of Livestock Currently Raised by Permittees

The definition of an AUM that we have used is consistent with rangeland management policy (FSH 2209.15) and is the term used by the Society for Range Management and other rangeland management agencies, universities and professionals. The Washington Office recently addressed the stocking rate issue and concluded that when an allowable use level is reached on a key species or key area, the livestock are to be moved or removed. The response (to an inquiry) states, “With this type of management, i.e. specifying allowable use on key species or key areas, the size of the livestock is not highly relevant. With larger animals and presumably a corresponding greater consumption rate, the allowable use level might be met sooner and the livestock moved off the pasture sooner than would occur with smaller animals. The stocking rate in this case becomes self regulating because management is based on meeting plant and other resource needs by meeting design criteria. There are other criteria being applied as well including seasonal restrictions, etc., all of which are designed to meet or move toward desired conditions (USDA Forest Service 2008)”. In order to be consistent with policy and the Carson Forest Plan FEIS (which includes the definition of an AUM (FEIS, p. 100)), we did not further address the stocking rate. However, we did develop specific monitoring measures for both riparian and grasslands (e.g. percent of plant composition in cool season grasses, percent woody species, percent bare ground, percent utilization) in addition to thresholds that will indicate when additional management is needed.

Alternatives Considered in Detail

Alternatives are used to evaluate different ways to resolve significant issues brought forth by the public during scoping (see previous section) and to satisfy the purpose and need for action. For this analysis, three alternatives have been considered in detail – no action, the proposed action and a third alternative that addresses a conversion in livestock from sheep to cattle or cattle to sheep. The purpose and need for action, along with the significant issues serve as the objectives and framework around which alternatives are developed. In this analysis, the five significant issues identified at the end of the purpose and need section can be addressed by analyzing the effects in the proposed action, by making some minor additions and/or clarifications to the proposed action and by adding alternative 3.

Alternative 1 – No Action Alternative

This alternative is the “no action” alternative and is required by the Council on Environmental Quality for the implementation of NEPA (40 CFR Part 1502.14d). The no action alternative is the point of reference for evaluating action alternatives. Under the no action alternative, domestic sheep and cattle grazing would no longer be authorized on the Jawbone allotment. The permittees would be required to remove all animals from the allotment and permits would be cancelled. All maintenance of range facilities would revert to the Forest Service, where they would be evaluated for wildlife, watershed and soil protection needs. Allotment fences would not be removed, as they would be needed to prevent use by livestock from adjacent active allotments (Tio Grande and

Tusas) and private property. Under the no action alternative, the forest plan would continue to guide the management of the area.

Alternative 2 – Proposed Action

This alternative is the proposed action as described in the purpose and need section. This alternative would authorize cattle and sheep as follows:

- There would be 330 cow/calf from June 16 to September 30 (107 days). There would be two sheep permits: (1) 720 ewe/lamb from July 1 to September 30 (92 days) and, (2) 556 ewe/lamb from July 1 to September 15 (77 days). On an annual basis, numbers may be adjusted to respond to resource conditions.
- Grazing would occur through a deferred or rest rotational system to allow for cool season grass production in alternating seasons.
- The Gavilan area acreage would become part of the La Manga pasture.
- A conservative grazing intensity with an allowable utilization range of 20 to 40 percent, depending on the vegetation type and current range conditions, would be used.
- To improve riparian area management, riparian areas would be identified by pasture. A pattern-of-use map would be established to document ungulate use. The annual operating instructions (AOI) would include salting for cattle/sheep at least 1/2 mile from key watering points. Management actions, such as moving livestock out of riparian areas, reducing cow/sheep numbers and salting would become part of the AOI and allotment management plan (AMP). See table 1 for the adaptive management plan that is part of this alternative.

Alternative 3 – Livestock Conversion

This alternative was developed in response to Significant Issue #5. This alternative is similar to the proposed action as described in the purpose and need section with one exception. This alternative allows for a conversion from cattle to sheep or sheep to cattle if a request is received from permittees. Like the proposed action, this alternative also includes additional adaptive management actions to be taken if resource conditions do not move toward desired conditions in an acceptable timeframe. Adaptive management considers other factors that contribute to resource conditions such as (but not limited to) periods of low precipitation and other natural events that are outside the control of the Forest Service. See table 1 for details on the adaptive management plan that is part of this alternative. This alternative would authorize both cattle and sheep. Components of this alternative are:

- With no requests for conversion of livestock, there would be 330 cow/calf from June 16 to September 30 (107 days). There would be two sheep permits: (1) 720 ewe/lamb from July 1 to September 30 (92 days) and, (2) 556 ewe/lamb from July 1 to September 15 (77 days).
- With a total conversion from sheep to cattle, there would be 486 cow/calf from June 16 to September 30 (107 days).

- With a total conversion of cattle to sheep, there would be 4,086 ewe/lambs from July 1 to September 30 (77 days).
- On an annual basis, numbers may be adjusted to respond to resource conditions.
- Grazing would occur through a deferred or rest rotational system to allow for cool season grass production in alternating seasons.
- The Gavilan area acreage would become part of the La Manga pasture.
- A conservative grazing intensity with an allowable utilization range of 20 to 40 percent, depending on the vegetation type and current range conditions would be used.
- To improve riparian area management, riparian areas would be identified by pasture, a pattern of use map would be established to document ungulate use and the annual operating instructions (AOI) would include salting for cattle/sheep at least 1/2 mile from key watering points. Management actions such as moving livestock out of riparian areas, reducing livestock numbers and salting would become part of the AOI and allotment management plan (AMP).

Mitigation Measures

No additional mitigation measures were identified by resource specialists. Alternative 2 and 3 incorporate specialist recommendations.

Monitoring

In both alternative 2 and 3, the adaptive management plan (table 1) would be used to move toward achieving both short and long term goals. Short-term monitoring would use grazing intensity and utilization guidelines to assess key area (upland meadow and riparian) use. Long term monitoring would consist of Parker 3-Step transects (also referred to as Parkers) and cover frequency. Since current parker locations do not fully represent the pastures, cover frequency transects would be established in new areas that are more representative of the Hopewell, La Manga and Brokeoff pastures. The new transects would be located in soil types with full livestock grazing capability that represent the majority of the pasture (with adequate distance from authorized and unauthorized roads, trails, boundaries, watering points, salt grounds and dispersed camping. The new locations would be reviewed and agreed upon by the permittees. Parkers and cover frequency would be referenced on the working deferred maintenance list in the future.

Cover frequency would be read between year three and year five to gauge changes in trend. In areas where Parkers transects would continue to be used, existing key areas would be monitored annually. Forage utilization, production and vigor would be estimated between years three and five to gauge changes in long term trend (vigor and productivity).

In the upland meadow key areas of the Brokeoff pasture (Mexican spotted owl habitat), the same methods would be used as described above to gauge improvement in plant percent composition. If monitoring indicates conditions are not being achieved, an adaptive strategy would provide options for adjusting management decisions and actions throughout the life of the permit to meet desired conditions.

Monitoring to provide baseline information on perennial stream habitat conditions would include: (1) Completion of the stream habitat inventory and report on the Rio Vallecitos by 2011; (2) Completion of the stream habitat inventory and report on the Rio Tusas and Little Tusas by 2012, (3) Completion of multiple pass depletion surveys on the Rio Tusas, Little Tusas and Rio Vallecitos by 2010, (4) Completion of macroinvertebrate sampling and analysis on the Rio Vallecitos, Rio Tusas and Little Tusas by 2010 and, (5) Monitoring the condition of the fence for maintenance needs in the Hopewell Lake Recreation Area. This would be completed annually, prior to livestock going on allotment.

Table 2. Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3
Rangeland condition and trend	Maintains (and/or improves to) good condition and a stable to upwards trend in all pastures	In Gavilan and La Manga, condition and trend improves from fair to good with the long term trend remaining at stable or moving upward In Hopewell and Brokeoff, range condition remains in fair to good with the long term trend at stable or moving upward	Same as Alternative 2
Vegetation Composition (including cool season grass density)	Improves with no grazing	Vegetation composition meets desired condition of > 27 (see table 4)	Meets desired condition of > 27 (see table 4) and may exceed desired conditions if a total permit reduction of 14% occurs if all sheep convert to cattle
Stream habitat condition	Improves in the Rio Vallecitos, Rio Tusas and Little Tusas. In Placer Creek, habitat may slightly improve but other factors continue to degrade habitat.	Same as Alternative 1	
Riparian habitat condition	Improves in both short and long term because plant density and cover increases	Maintained and/or slightly improved as impacts to riparian woody and herbaceous plants are better managed	Same as Alternative 2
Watershed condition	Localized improvements but does not change 5 th code watershed condition because only 1.8% of the watershed is affected	Maintained in both short and long term. Conditions at the 5 th code level do not change because only 1.85 of the watershed is affected	Same as Alternative 2
Forage availability	Improves	Forage production desired condition (see table 4) is met or exceeded	Same as Alternative 2

	Alternative 1	Alternative 2	Alternative 3
Economic and social benefits	Adverse effect to lifestyle and culture	Social element is maintained but potential gross income is likely to be affected in years of poor SPI and in years where resource conditions require a shorter season of use	Same as Alternative 2. The ability to convert (cattle to sheep/sheep to cattle) would be voluntary. Therefore, there would be no imposed economic hardship.
Threatened and Endangered species: Mexican spotted owl (MSO),	An increase in the density of vegetation species (shrubs, forbs and grasses) improves prey base species habitat	Neither alternative would limit the diversity and seasonal availability of forage for MSO prey base species. There would be no change that would result in owls leaving the area. Both alternatives should increase forage diversity and seasonal availability over time.	
Forest Service Sensitive terrestrial and aquatic species	Improved terrestrial habitat for riparian, predatory, and upland species. And improved stream habitat conditions for aquatic species with no affect to individuals or their populations	Potentially impacts individual aquatic, riparian, predatory, and upland meadow species but no measurable negative effects to populations	Same as Alternative 2
Forest Service Sensitive plant species	Any risks related to trampling or grazing would be eliminated	Risks of trampling or grazing remain but plant vigor is improved with grazing system.	Same as Alternative 2
Forest Management Indicator Species (MIS) – elk, resident trout and aquatic macroinvertebrates	Habitat is improved and forest wide habitat and populations trends are maintained	Elk/livestock grazing conflicts continue. However, there is greater forage diversity in both the short and long term Resident trout and macroinvertebrate habitat condition improve. Forestwide habitat and population trends are maintained.	Same as Alternative 2
Mule deer and black bear	Forage competition (with livestock) does not occur and there is greater forage diversity (in both short and long term)	Competition for forage (with livestock) continues. However, there is greater forage diversity in both the short and long term	Same as Alternative 2

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Chapter 3 – Environmental Consequences

Chapter 3 summarizes the physical, biological, social and economic environments of the affected analysis area (analysis area) and the potential changes to these environments if the alternatives were implemented. Chapter 3 also presents the scientific and analytical basis for the comparison of alternatives, as presented in the following table 3 – Effects comparison by alternative in chapter 2. Chapter 3 complies with the implementing regulations (40 CFR 1500-1508) of the National Environmental Policy Act (NEPA) for analytic and concise environmental documents (40 CFR 1502.2). The project record (see Appendix A for the project record index) contains copies of the full reports for most of the resources analyzed.

Environmental resources could be affected in various ways during implementation of alternatives. The effect, or impact, is defined as any change or alteration in the environment’s existing condition produced by the alternatives, either directly or indirectly. NEPA regulations (40 CFR 1508.27 (a)) refer to effects in terms of short and long term duration. For this analysis, short-term effects may be considered as occurring over a period of up to five years, while long-term effects are considered to be up to ten years. Chapter 3 analyzes the environmental consequences of the proposed action and any alternatives to the proposed action. The analysis of effects for alternatives 2 and 3 under each resource is described with the assumption mitigation measures described in chapter 2 would be applied.

Cumulative Effects

A cumulative effect is the effect on the environment that results from the incremental effect of the action when added to the effects of other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes the other actions and regardless of land ownership on which the other actions occur. An individual action when considered alone may not have a significant effect, but when its effects are considered in sum with the effects of other past, present and reasonably foreseeable future actions, the effects may be significant. Cumulative impacts are assessed in terms of how the proposed action would add to the past, present and reasonably foreseeable activities.

Past, present and reasonably foreseeable activities within the Jawbone allotment boundary are listed in table 3. Other pertinent activities outside the allotment are also included. Completing the cumulative effects analysis required each specialist to choose those activities from the list that overlaps in time and space and location with each alternative. The specialist then analyzed the incremental effect of the alternative when the proposed action was added to these activities.

Table 3. Past, Present and Reasonably Foreseeable Actions

No.	Project or Activity Name	Description	Status	Affected Area (or acres)
Past, Present and Reasonably Foreseeable Activities within Jawbone allotment				
1	Hopewell Recreation Area fence enclosure	Fence construction to enclose the recreation area	Foreseeable – 2009	0.5 mile
2	Condition of allotment boundary “let down” fence condition in Gavilan area	Provides separation between Jawbone and Tusas allotment	Ongoing	3 miles

No.	Project or Activity Name	Description	Status	Affected Area (or acres)
3	Poor allotment boundary fence condition	Provides separation between private lands and allotment's western boundary	On-going	11.5 miles
4	Poor allotment boundary fence condition in Brokeoff pasture	Separates Jawbone and Tio Grande Allotment	On-going	5.5 miles
5	Ineffective Jawbone Mtn. fence location	Separates Brokeoff pasture and the Tusas allotment	On-going	1.5 miles
6	forest motorized management	Reduction in miles of road open to motorized vehicles	Foreseeable – 2009	8 miles of 24 miles total may be removed
7	Maquinita Vegetation Treatment	Vegetation thinning and prescribed fire	Foreseeable 2009- 2013	110 acres
8	Hopewell Recreation Area	Developed campground and day use area that has dispersed uses occurring around it. Grazing is excluded from the recreation area.	On-going	Not quantified
9	Private lands	within Hopewell pasture	On-going	98 acres
10	Continental Divide National Scenic Trail	Recreational use that is be within Hopewell pasture	Existing/ Foreseeable –	5 miles of trail exist and 1.2 miles to be constructed by 2010
11	Unauthorized motorized use (ATV and 4WD)	Within all pastures/areas	On-going	Hopewell - 16 miles La Manga -20 miles Gavilan area – 14 miles Brokeoff – 6 miles
12	Private lands and FS recreation infrastructure	Adjacent to Placer Creek perennial stream	On-going	1.5 miles
13	Recreational mining	Placer Creek in Hopewell pasture	On-going	1.5 miles
14	Tony Marquez Trail	Recreational use within La Manga pasture and Gavilan area	On-going	12 miles
Past, Present and Reasonably Foreseeable Activities outside of Jawbone Allotment				
15	Forest products harvest along Highway 64	vigas and latillas	Foreseeable – 2008 - 2011	200 acres

Rangeland Vegetation [51]

Range Condition and Trend

Two methods were used to determine rangeland condition and trend: Parker 3-Step transects and Rapid Assessment Method (RAM). The Parker transect locations were established in the 1950s. Parker transects were read in the Hopewell and La Manga pasture. RAM data was used to assess the Gavilan area and in the Brokeoff pasture because a Parker transects does not exist in Gavialn and Brokeoff pasture Parker could not be located. Although these are two different methods, RAM data was scored like Parkers to be able to compare data (see specialist report for additional information).

Parker range condition is a composite calculation of vegetation composition (plant diversity) which is weighted with a 54 percent value, frequency (the occurrence of perennial forage plants along a transect line and percent bare ground) which is given a 36 percent value and vigor (the average maximum leaf length on important desirable species measured on available decreaser and increaser specie) which is given a 10 percent value. See the specialist report for additional details on how range condition is calculated. Some indicators which were measured (such as soil disturbance and soil stability) are not displayed here.

Table 4. Parker 3-Step Range Condition Class Description

Parker Rating	Adjective Description of Condition	Ecological Condition*
81-100	Excellent	High
61-80	Good	High
41-60**	Fair	Moderately High
21-40	Poor	Moderately low
0-20	Very poor	Low

* See Forest Service Manual (FSM) 2213.1, August, 1985

Since the time that the original Parker locations were established, allotment attributes and land use change has occurred. This includes changes in allotment boundaries, authorized roads, the class of livestock, an increase in elk herds, increased recreation and decreased logging activity. These factors influence how accurately the pasture is represented by the Parker transects. To resolve this, Parker long term transects representation would consider changes in land use and Cover Frequency transects will be established in new areas that are more representative of the Hopewell, La Manga and Brokeoff pastures (see monitoring section).

Parkers 3-Step transects do not have a procedure for estimating forage production. Therefore, in 2006, forage clippings along the transect locations were calculated referencing the RAM procedure to estimate forage production. Forage production was used to estimate the carrying capacity of allotment using the forage allocation method. Estimated forage production is a baseline for future reference. Forage production where range conditions are good to excellent was based on potential TEU data (median) under near normal climate.

Trend Descriptions

Descriptions used to describe apparent trend are upward, not apparent, and downward. Apparent vegetation trend is estimated at one point in time when range transects are read. For example, if a Parker transect is read in a drought year, the apparent trend will probably be downward. If the Parker is read after 3 wet years, the apparent trend may be upward (depending on the initial range condition). A few indicators of apparent upward vegetation trend include: (1) Desirable and intermediate forage plants are becoming more abundant, (2) Desirable and intermediate forage plants are invading bare ground or stands of undesirable plants (a variety of all age classes of better forage plants must be present), (3) There is establishment of perennial plants, (4) There is several years of vigorous growth on browse, (5) Decreaser plants are increasing and vigorous, (6) There are grasses with long, green leaves and numerous healthy seed stalks and, (7) There is a well-dispersed accumulation of litter (see specialist report for additional information).

The term “no apparent trend” is used when indicators are neither upward nor downward. No apparent trend is not described in the Parker procedure. It is a professional judgment referencing historical photos and data.

Indicators of apparent downward vegetation trend include: (1) Desirable and intermediate species are decreasing in vigor, (2) There is a lack of young plants from desirable and intermediate species, (3) There is invasion by undesirable species, (4) There is hedged and high-lined shrubs and dead branches generally indicate that shrubs are dying back and, (5) Litter is scarce and poorly dispersed.

Descriptions used to determine long term trend are upward, stable and downward. Long term trend is determined by evaluating historical range condition data and photos to existing range condition data and photos obtained from the Parker transects. If historical data indicates trend is neither upward nor downward, it would be described as stable. Historical range condition, apparent trend and long term trend are used to determine if range management is meeting forest plan objectives.

Influences on range condition, apparent trend and long term trend

The Forest Service uses the Standard Precipitation Index (SPI) to define drought conditions and adjust authorized livestock to maintain or allow range conditions and trends to increase. The amount of precipitation received is the strongest influence on range conditions (vegetation composition, frequency, vigor and production) and trends. This information is documented in the current AOI. The amount of precipitation has a significant effect on the pounds of forage produced. SPI at or above 0.75 (moderately Wet) for several consecutive years could result in the range condition score remaining or increase with no apparent to upward apparent trend and stable to upward long term trend. SPI values at or less than -0.74 (near normal) for several consecutive years could result in the range condition score remaining or decreasing with no apparent to downward apparent trend and a stable to downward long term trend.

Affected Environment

The existing and desired range conditions of Hopewell, La Manga, Gavilan (area) and Brokeoff pastures are shown in table 4. Range conditions in Hopewell and Brokeoff were found in fair to good conditions. Range condition within La Manga and Gavilan pastures were slightly below desired conditions.

The existing and desired range conditions were estimated using the Parker 3-step (Hopewell and La Manga) methodology as described in Range Analysis and Management Handbook (Chapter 40 1988). Percent cool season grass production was calculated from Parker and RAM data as it is not a measure in the Parker 3-step. Rapid Assessment methodology (RAM) was used to estimate forage production and baseline data for the Gavilan area and Brokeoff pasture. RAM Data was scored referencing Parker methodology. Bare soil desired condition was estimated based on Parker 3-step and Terrestrial Ecological Unit 133E (1985).

Current range condition reflects past and present influences and management actions. The condition of riparian areas such as Hopewell that have been influenced by recreation (and past gold mining) and wildlife use; and, the change in range condition and trend on the allotment and surrounding areas. The change in condition and trend (within and outside the allotment) affects carrying capacity and ungulate use. Areas surrounding Jawbone allotment are Forest Service allotments and former land grants that have been divided into separate parcels of private land. In addition, there continues to be a conversion from sheep to cattle (with cattle that are of larger breeds). This has influenced the degree of competition between livestock and elk.

Adaptive management has been applied to the allotment in terms of responding to resource conditions. From 2001 to 2003, drought influenced the existing conditions on the allotment. After 2002 rest rotation grazing pattern was used to address 20-40% utilization in drought recovery. It resulted in intensified utilization on pastures. Pastures rested during the drought generally had stunted low forage production. This minimized management goals of having 20 to 24 percent utilization overall and influenced the rate of recovery on the used pastures in the following season. Since 2003, the district has referenced the 2003 drought management action plan using SPI to support reductions in authorized livestock.

Evaluation of historical timing in each pasture was completed to change the pattern of use to a deferred rest rotation. This addressed the utilization guideline of 20 to 40 percent in drought recovery years. Deferred rest rotation allows use on all pastures while addressing the utilization guideline. Deferred rest rotation allows forage growth at some point in the season to all pastures stocked with authorized livestock. Days and livestock numbers were compared to the 2006 forage allocation estimates to verify that the numbers were within the allotment's carrying capacity.

Table 5. Jawbone Allotment Existing and Desired Rangeland Conditions

Pasture	Indicator	Existing Condition	Desired Condition (DC)	Meets DC? Y (Yes)/ N (No)
Hopewell	Range Condition	Fair to Good (72)	Fair to Good	Y
	Apparent Trend	Not Apparent	N/A	N/A
	Long-term Trend	Stable	Stable	Y
	Vegetation Composition Rating	44	>27	Y
	Cool season grass composition	60%	30% -73%	Y
	Vegetation Frequency	20	>19	Y

Pasture	Indicator	Existing Condition	Desired Condition (DC)	Meets DC? Y (Yes)/ N (No)
	Vegetation Vigor	8	>=5	Y
	Bare Ground (% average)	5% (based on Parker “hits”)	<15% in TEU 133 and <20% in remaining key areas	Y
	Woody Species	0%	>15% in riparian and <15% in other key areas	Y
	Estimated Forage (lbs./acre)	1,196,015 lbs	27,538 +	Y
La Manga	Range Condition	Fair (48)	Good	N
	Apparent Trend	Downward	N/A	N/A
	Long-term Trend	Downward	Upward	N
	Vegetation Composition Rating	25	>27	N
	Cool season grass composition	60%	30% to 73%	Y
	Vegetation Frequency	15	>19	N
	Vegetation Vigor	8	>=5	Y
	Bare Ground (% average)	34%	<=30%	N
	Estimated Forage (lbs./acre)	18,475	18,475+	Y
Gavilan	Range Condition	Fair (77)	Good	N
	Apparent Trend	Not Apparent	N/A	N/A
	Long-term trend	Unknown	Upward	Unknown
	Vegetation Composition Rating	36	>27	Y
	Cool season grass composition	60%	30% to 73%	Y
	Vegetation Frequency	36	>19	Y
	Vegetation Vigor	5	>=5	Y
	Bare Ground (% average)	41%	<=30%	N
	Estimated Forage (lbs./acre)	12,211	12,211	Y
Brokeoff	Range Condition	Good (74)	Good	Y
	Apparent Trend	Not Apparent	N/A	N/A
	Long-term trend	Stable	Stable	Y

Pasture	Indicator	Existing Condition	Desired Condition (DC)	Meets DC? Y (Yes)/ N (No)
	Vegetation Composition Rating	33	>27	Y
	Cool season grass Composition dots and hits	50%	30%-73%	Y
	Vegetation Frequency	31	>19	Y
	Vegetation Vigor	10	>=5	Y
	Bare Ground (% average)	23%	<=30%	Y
	Estimated Forage (lbs./acre)	31,725	31,725+	Y

Note: See table 4 and pp. 19 to 21 for more information on the Parker ratings.

Environmental Consequences

Significant issues addressed in this analysis:

Significant Issue #4: There should be a reduction in cattle numbers to improve resource conditions. The proposal should include a reduction in the permitted numbers of cattle authorized on the allotment to maintain and/or achieve good range conditions and improve riparian plant communities.

Indicators used to measure effects: How ungulate use affects range condition and trend is analyzed. The indicators are vegetation composition (plant diversity), frequency (occurrence of perennial forage plants along a transect line and percent of bare ground) and vigor (the average maximum leaf length on important desirable species measured on available decreaser and increaser specie).

Alternative 1

In the short term, with no livestock grazing on the allotment, it is predicted that overall range condition and trend would improve in all pastures. Plant composition (including cool season grass density-decreasers) would improve from the impacts of no grazing. Without livestock grazing, there would be less forage use. Pastures would have less ungulates to support, unless there are shifts in wild ungulate pattern of use. Wildlife use, primarily elk, occurs as long as weather conditions allow. Elk grazing is expected to continue and possibly increase without cattle presence throughout the allotment. Therefore, range condition may not reach good-excellent desired conditions under this alternative in the long term, because (elk) grazing would be expected to continue.

Effects common to Alternative 2 and 3

Managing Gavilan and La Manga as one pasture would eliminate repeated spring use by sheep and follow a deferred rest rotation by all livestock. Annual alternative rest by livestock would result in opportunity for range condition (vegetation composition, frequency and vigor) to maintain or increase. Bare ground would be expected to be maintained or decreased as a result of

deferred rest rotation and estimated range condition increase. Change in managing Gavilan and La Manga as one pasture would allow range condition an opportunity to move from fair to good with long term trend remaining at stable or moving upward.

Annual and seasonal precipitation and temperature fluctuations, referenced with the SPI, would influence achieving desired range condition. Under consecutive drought or on severe drought conditions, there would be an expected decrease in all range condition measures and ratings. During consistent wet conditions, all range condition measures and ratings would be expected to be maintained or increased.

Authorized livestock stocking rate and rotation is the only adjustment Forest Service management can make at this time. These adjustments have been annually routinely occurring. Maintaining or increasing the range condition score is dependent on all ungulate stocking rates which influences the range condition, apparent trend and long-term trend (in the next ten years).

Deferred rest rotation of La Manga (including Gavilan) would provide an opportunity for range condition improvement towards desired range condition, long-term trend, and soil stability index within the life of the permit (10 years). In addition, if resource conditions do not support range condition moving towards desired, management reaction would be to adjust according to resource conditions with authorized livestock, increase herd management, and adjust rotation schedule. There may be conflict with if entry dates are adjusted. Permittees who operate on the TCLP allotment would leave the allotment and expect to enter the Jawbone allotment as scheduled. TCLP allotment numbers may have to be adjusted. With altered entry dates, permittees would experience high conflict as they would be leaving the TCLP allotment. Authorized livestock numbers, the rotation schedule would probably be adjusted and there would be a need for increased herd management. Weather is the driving factor in vegetation response, followed by forage production and ungulate utilization. Ungulate timing, duration and intensity, influence range condition in one season or repeated seasons. Authorized livestock stocking rate and rotation is the only adjustment management can make at this time (this is currently occurring). Maintaining or increasing the range condition score is dependent on all ungulate intensity which would influence the range condition, apparent trend and long term trend in the next ten years. Wild ungulate use will continue to occur at unknown levels.

Alternative 2

It is anticipated that overall range condition and trend would remain in fair to good condition with a stable to upwards long term trends in near normal to wet weather conditions in Hopewell, La Manga and Brokeoff pastures. All desired range conditions would have an opportunity to be met or exceeded indicators (table 4). Current allotment management would be similar under alternate 2, with an emphasis on monitoring.

Alternative 3

It is anticipated that overall range condition and trend would remain in fair to good condition with a stable to upwards long term trends within the Hopewell, La Manga and Brokeoff pastures. All range condition desired conditions would have an opportunity to met or exceeded (see table 4) because there would be a 9.4% to 14% reduction in permitted livestock with the conversion of sheep to cattle. It is highly probable that current permitted cattle would not convert to sheep due to economics, management and market demand. It is highly probability that the remaining sheep

permit would convert to cattle in the future with a total permit reduction of 14%. Authorized livestock numbers would continue to reference climate and resource conditions to address resource protection. Current allotment management would be similar to this alternative. However, Alternative 3 emphasizes monitoring, complete deferred rest rotation, and 9.4% to 14% reduction in permitted livestock numbers.

Cumulative Effects

Current range condition reflects all past and present influences and management actions (see discussion above) Reasonably foreseeable actions (table 3) that have potential to effect range conditions are motorized travel management and dispersed recreation (hunting and camping), In addition, surrounding area range condition (both on private and the forest) and increasing elk herd numbers have potential for influencing the timing, duration and intensity of authorized livestock management within the Jawbone allotment.

The cumulative effects are the same as described above in alternative 1. Even with no authorized use, elk grazing is expected to continue and possibly increase without cattle presence throughout the allotment. Therefore, range condition may not reach good-excellent desired conditions under this alternative in the long term, because (elk) grazing would be expected to continue.

In alternative 2 and 3, the travel and related dispersed recreation management proposal would reduce total road miles open motorized vehicles from 56 miles to 16 miles (note: the specialist report shows 8 miles of authorized road and 56 miles of un-authorized road). There would be less opportunity (reduced risk) for invasive plant (un-desirable) establishment because there would be less transport from motorized vehicles. Once invasive plants are established, the result is competition with native forage plants, increased bare soil, and less forage production with an overall reduction of range conditions. The estimated potential affected area is 32 –192--acres, based on a 4-acre per mile calculation. Indirectly (assuming effective closures result in is less unauthorized cross-country travel, this could reduce ground disturbance resulting in vegetation increase and reduced erosion on closed roads in the long term. Just because the road is closed does not mean erosion would decrease. The road is still compacted bare ground with no vegetation that would slow down erosion. Erosion will slow down as vegetation is established.

In both alternative 2 and 3 range condition on the allotment (and north central New Mexico in general) would be influenced positively, negatively or maintained when seasonal, annual and long term weather conditions, combined with intense early season elk use (that is followed by authorized livestock) occurs during annual and long term weather fluctuations. If vegetation composition frequency and vigor declines, forage production would be reduced in areas surrounding the allotment. There would be an expected increase in elk use on the allotment (due to ungulate grazing of highly palatable cool season forage (decreasers)). The expected early season elk use would influence vegetation composition, frequency, and vigor (Dietz 1988-1989). Consecutive years of wild and domestic ungulate pattern of use can be compounded by drought and magnify negative impacts on range condition. The scale of potential impacts is the allotment and the surrounding areas. Areas surrounding Jawbone allotment are Forest Service allotments and former land grants that have been divided into separate parcels of private land.

Soil and Water [42]

Soil Condition and Productivity

Soil condition is an evaluation of soil quality based on an interpretation of factors which affect three primary soil functions. The primary soil functions evaluated are soil hydrology, soil stability and nutrient cycling. Maintaining productive soils and a healthy watershed are recognized as the basic ecosystem indicators. Livestock grazing can affect these soil functions through alteration of the vegetative community, removal of plant material and organic matter inputs, physical compaction of the soil surface by trampling and other effects that are important to maintenance of long term soil productivity.

Data from the Carson National Forest TES survey (Edwards et al 1987) was used and an initial determination of soil stability. Approximately 51 percent (9,383 ac.) of the allotment is in satisfactory soil condition and 49 percent (9,085 ac.) is considered to be impaired. There are no acres that are in unsatisfactory condition (see specialist report for additional information).

Water Resources

The Jawbone allotment is within four 5th code watersheds: Rio de los Pinos-Rio San Antonio; Chavez Creek, Rio Tusas and Rio Vallecitos. The allotment is 1.8 percent of the total watershed acreage.

There are three impaired stream segments in the allotment (State of New Mexico 2006-2008):

- Hopewell Lake is not fully supporting high quality aquatic life. The probable causes of impairment include nutrient/eutrophication biological indications and sedimentation/siltation. Probable sources are habitat modification-other than hydromodification, other recreational pollution sources, rangeland grazing and streambank modifications/destabilization.
- The Rio Tusas (Rio Vallecitos to the headwaters) is not supporting coldwater and warmwater aquatic life. The probable causes of impairment relevant to allotment management are sedimentation/siltation. Probable sources are loss of riparian habitat, rangeland grazing and streambank modifications/destabilization.
- The Rio Vallecitos (Rio Tusas to the headwaters) is not supporting both coldwater and warmwater aquatic life. The probable causes and sources are the same as noted for the Rio Tusas.

Riparian

The allotment contains approximately 1,349 riparian acres (7.3 percent of the allotment acreage). Riparian areas on the allotment include:

- Placer Creek/headwaters in Gavilan area
- Placer Creek in Hopewell pasture (south of Hopewell Lake/mining claims),
- Rio Tusas headwaters in La Manga/Rio Tusas in Brokeoff pasture
- Canada Tio Grande/headwaters in La Manga pasture
- Rio Vallecitos in Hopewell pasture

- Hopewell Lake Recreation Area (which is excluded from allotment but is affected by grazing because a fence enclosure is not complete)

Ephemeral and intermittent streams include by pasture/area include: Canon Manga (La Manga pasture), East Gavilan Canyon (Gavilan area) and Long Canyon (Hopewell pasture).

Riparian conditions were also determined by evaluating Riparian Area Survey and Evaluation System (RASES) transects conducted between 1988 and 1991. Seven RASES transects were located in various reaches for Placer Creek and Rio Vallecitos (see specialist report for location information). The transects document many stream channel, aquatic ecosystem and riparian community attributes as well as evaluate riparian condition against the desired future condition statements outlined in the forest plan for riparian (MA 14). Transects measure the following criteria: (1) percent shade over water (desired condition (DC) is 80 percent), (2) percent bank protection (DC is 80 percent), (3) percent Substrate Free of Inorganic Sediment (DC is 85 percent), (4) percent Shade over Land Surface (DC is 60 percent) and, (5) percent Woody Plant Composition in Riparian Species (DC is 60 percent).

The original RASES data was compared to riparian field assessment data gathered in 2006. The Jawbone 2006 riparian assessments were located in reaches that included the Rio Tusas, Placer Creek and Rio Vallecitos. Riparian vegetation (willows, rushes) is not typically present in the TEU 67 map unit areas within the intermittent streams in Hopewell, Brokeoff and Gavilan at the wider drainages. It is found in steep narrow canyons and riparian vegetation such as willows, alders, sedges or rushes are present.

- In terms of meeting forest plan desired conditions for riparian, the 2006 data indicates: (1) criteria 1 and 2 were met in 3 of 10 transect locations, (2) criteria 3 was met in 6 of 10 locations, (3) criteria 4 was met in 7 of 10 locations and (4) criteria 5 was met in 2 of 10 transect locations. In comparing the 2006 field data to the original RASES data:
- Percent shade over water has possibly remained the same or changed in a positive direction for 3 of 5 locations, and,
- Percent bank protection has possibly changed in a positive direction for 4 of 5 locations.

The riparian field assessments determined that grazing activities and other uses (hunting, dispersed recreation use) are currently impacting riparian areas within the allotment analysis area. Impacts observed include:

- Stream bank trampling and bank shearing which result in channel widening, sediment inputs, decreased streamside cover and increased solar exposure (increased water temperature),
- Trailing along and across riparian areas and channels,
- Grazing of woody riparian vegetation, notably remnant willows in small intermittent and interrupted perennial stream segments,
- Development of headcuts along stream channels, and,
- Compaction of surface soil layers, as determined by the presence of platy soil structure.

It is estimated that approximately 0.04 percent (0.5 acres) of the total land area within riparian corridors (1,349 acres) are being negatively impacted by current grazing management. There was limited field observation or assessments on 3.94 riparian acres or 0.3 percent of the 1,349 riparian acres.

Watershed Condition

In terms of watershed condition, the analysis area is in a Class II condition. This means that there is reduced herbage to protect the soil surface and resist soil erosion, reduced surface organic matter, reduced vegetation cover negatively impacting infiltration and surface runoff, and reduced soil surface stability in plant interspaces and in stabilizing agents. Ground cover, litter and bare ground are not at the levels expected for the ecological sites.

Floodplains and Municipal Watersheds

There are no management activities in the proposed action that relate to the development or occupation of the floodplains and the 1986 EIS for the forest plan (Carson 1986) did not identify any municipal watersheds on the Forest. Floodplains and municipal watersheds will not be discussed further (see specialist report for additional information).

Wetlands

Within the analysis area, wetlands, in the form of intermittent wet meadows, are associated with the drainage network and may be found in areas of TEU map unit 12, 67 and 68, but areas typically do not have the soil and water characteristics necessary to be classified as wetlands. In addition, the low precipitation that the area receives does not make the soils conducive for creating a wetland. The riparian section references these riparian TEUs.

Air

Currently, the annual management instructions for the allotment include livestock herding within pastures, or livestock gathering for movement between pastures and allotment exit (as required by the pasture rotation schedule). These activities (along with the permittee periodically driving along the native and fill surfaced roadways) are activities that could result in effects to air quality, either from vehicular emissions or dust production. These effects are typically short term and localized in their nature.

Environmental Consequences – Soil, Water and Air Quality

Significant issues addressed in this analysis:

Significant Issue #3: Implementation of Adaptive Management. Management actions moving livestock out of riparian areas daily need to be part of the preferred alternative for reauthorization. Waiting until a trigger (threshold) occurs is condoning current management and disregards any monitoring efforts. **Indicators used to measure effects:** Impacts to riparian habitat is measured in terms of percent plant community diversity, percent woody species, percent bare ground and percent utilization.

Significant Issue #4: There should be a reduction in cattle numbers to improve resource conditions. The proposal should include a reduction in the permitted numbers of cattle authorized on the allotment to maintain and/or achieve good range conditions and improve riparian plant communities. **Indicators used to measure effects:** The indicators for riparian condition are percent plant composition for cool season grasses, frequency, vigor, percent woody species, percent utilization and riparian stubble heights.

Alternative 1

It is expected there would be positive changes to the vegetative community, ground cover and desirable vegetation (see rangeland vegetation section). This would affect soil and watershed conditions in a positive manner by: 1) the retention of existing vegetative biomass on-site; 2) increasing the amount of re-incorporation of this biomass into surface litter and soil organic matter; 3) providing for increased levels of surface soil cover; 4) improving surface soil aggregation and structure from increased organic inputs; 5) increasing protection from water and wind erosion, and, 6) increasing levels of fine fuel loads over the allotment areas. The increased biomass would also result in maintaining the amount of nutrients returned to the soil. This would enhance the productivity, fertility and water holding and release functions of the soil resource. Surface water yields may show a decrease, due to more groundcover accumulation and surface water runoff events may show an increased length-of-duration as the increase in groundcover, trees and shrubs occurs.

Water quality would be maintained or improved because of the greater amounts of ground cover or organic matter. The ground cover assists in reducing wind and water erosion or surface water velocity, as well as, improving the soil's water holding capacity. Increases in vegetation growth, standing matter and groundcover would also improve soil productivity. The current status of water quality and full attainment of State of New Mexico designated uses of surface water would be expected to continue in Placer Creek (Hopewell Lake to headwaters and Rio Vallecitos to headwaters, with some uses not assessed). The assessed areas not in full attainment of the designated uses of surface water would be expected to move towards the objective of full attainment in the next ten years. Under this alternative of no grazing, livestock grazing impacts (that cause sedimentation/siltation or bank destabilization) would not occur. Private land uses (agriculture, irrigation and livestock grazing) adjacent to the watershed areas directly impacts impairment status. Within the analysis area, there are no proposed projects that would directly impact the watersheds and increase the production of sediment and silt.

Riparian vegetation condition would be expected to improve, in both short and long term, as the impacts from authorized grazing from livestock are removed and as woody/herbaceous plants increased in density and cover. Within the various intermittent streams that contain segments of herbage vegetation, stream channel shading may not measurably increase or lower surface water temperatures during the summer season. Within the intermittent channel's localized riparian areas of woody species, the limited increase in woody riparian vegetation would also provide deep root mass to adjacent bank areas. The ability of these infrequent riparian areas to mitigate flood flows, filter sediment and store and release stream flow may also be enhanced. This may result in a localized improvement to the watershed condition and water quality as sediment generated by other existing land uses and topographic features may be more effectively processed, filtered and reduced in these limited riparian areas.

Air quality would remain static, as dust and particulates originating from vehicle/trailer use, herding and other activities generated by grazing permittees would cease within the local area of impact. Other localized impacts to air quality would continue however, as the remaining dust generating activities (road use for recreational and other forest product uses) would continue.

Alternatives 2 and 3

The effects of both alternatives to vegetation are described in the rangeland vegetation section. The desired condition may not be met within ten years when *Near Normal* to *Moderately Dry* SPI

conditions occur during the majority of the period. This would directly affect soil and water resources.

Continued livestock grazing would maintain or improve current levels of existing vegetative biomass on-site and maintain the re-incorporation of this biomass into surface litter and soil organic matter. This would result in maintaining current surface soil cover, organic inputs and protection from water and wind erosion, provided the flexible adaptive approach is utilized and permittee compliance with the AOI is accomplished. Utilization levels of forage species would continue and the presence of desirable decreaser species within riparian areas would continue to be maintained or slightly improved in these areas.

Within the next 10 years, the acreage assigned impaired/unsatisfactory ratings would make progress towards the desired condition, nutrient cycling and soil condition rating by the improvement of the percent of ground cover, bare ground, litter and desirable herbage (see the soils, watershed and air report in the project record for additional details on how specific TEUs would change or be affected).

Applying BMPs would cause a slight increase in watershed conditions within the allotment. The deferred pasture/rest rotation systems would continue to be employed with rested or nonuse pastures showing improvements in vegetative composition and density. Watershed condition within the analysis area would be expected to remain in its current condition as the limited impacts currently occurring (trampling of intermittent stream banks, bank shearing and sediment inputs) would continue to affect these areas in the short term. In the long term, similar limited impacts would continue to occur. Watershed condition within the entire 5th code watershed area would not be expected to change from the current condition as both alternatives would only directly affect 1.8 percent of the total watershed (Rio de los Pinos-Rio San Antonio; Chavez Creek, Rio Tusas and Rio Vallecitos) area.

The status of water quality and full attainment of the State of NM designated uses of surface water would be expected to continue (see water quality section above). However, private land uses adjacent to the various reaches within the rivers (Placer Creek, Rio Tusas and Rio Vallecitos) directly impacts impairment status in addition to Forest Service authorized grazing. Additional measures to decrease impacts to the riparian vegetation and intermittent stream channels within the analysis area include various management actions (proper stocking levels, adherence to the AOI, on-the-ground oversight and management by the permittees).

The riparian vegetation condition would be expected to be maintained or slightly improved over the long term, as grazing continues and measurable impacts to the riparian woody and herbaceous plants are adaptively managed. The ability of these riparian areas to store and release stream flow, as well as filter sediment from sediment generating activities and features (roads, OHV use, gathering forest products and recreational use), would continue to slightly improve in the long term.

Air quality would be expected to remain static from the existing condition, as dust and particulates originating from vehicles/trailers, herding and other activities by permittees would continue, along with the continuation of other dust generating activities (road use for recreational and other forest product uses).

Cumulative Effects

Past, current and future activities within the fifth-code watersheds include livestock grazing, earthen stock tank developments, water developments, prescribed burns, fuelwood gathering and sales, timber stand improvement, thinning, pile burning, gravel pits, utility corridors, regional landfill site, forest road maintenance, mechanical vegetation treatments, hunting and recreational pursuits. These activities would result in greater long term positive effects to the watershed condition (see table 3).

Future range improvement projects (that would occur under the Adaptive Management Plan, see table 1) would contribute to an improved condition within the watershed. However, negative effects to the soil resource from congregation of animals at or near water sources would continue under both action alternatives. Although naturally occurring erosion and woody species encroachment would continue, considering the past, present and foreseeable actions, there would be no significant cumulative actions.

Cumulative water quality and water yields would show immeasurable change from current levels. Surface water runoff duration would remain at around current levels. Ground cover would be maintained or improved from current levels. There are TES map units with levels of severe sheet and rill erosion-hazard with no vegetative cover. Permitted grazing outside the analysis area would still continue. Impacts (direct, indirect and cumulative) associated with this activity are minimal within the State of NM designated uses of surface water that are fully supporting in the watersheds as described in the water quality section.

Within the watersheds that contain the designation of not supporting uses and are impaired, under alternative 2 and 3, as a result of adaptive management implementation, the direct and indirect negative impacts to the watersheds from livestock grazing would be minimal. Within the analysis area, there are no proposed projects that would directly impact the watersheds and measurably increase the production of sediment and silt. The on-going activities occurring on private land within the watershed areas (Placer Creek, Rio Tusas and Rio Vallecitos) directly impacts the total maximum daily load. Private activities such as agriculture, irrigation and livestock grazing, directly causes sedimentation and siltation that resulted in the assessment designation of not supporting coldwater and warmwater aquatic life. Under Alternative 2 and 3, cumulative effects would be dependant on the success of the adaptive management approach outlined for grazing management activities.

OHV and dispersed recreation uses would continue, resulting in a minor level of cumulative effect as this use is typically associated with or in near proximity to surface water flows. District-wide forest product uses would continue within the watersheds, mostly in the form of vigas, latillas and personal use fire wood gathering. These activities are small in size, located in coniferous forest or aspen cover types and associated with roads that provide access to the products. The effects of this type of activity ranges from none to minor in extent and do provide limited increases in herbaceous vegetation if forest canopy is opened. The travel management policy would prescribe the locations for harvested products since the designated roads (map) would limit area accessibility (see table 3).

On-going management activities such as road maintenance are not expected to cumulatively impact water quality as most of the road system is established, and maintenance activities are focused on routine activities which are typically minor in their extent. Existing roads that are not

within the open road system designated by the travel management map would not be maintained and would be obliterated (see table 3).

In the long term, forage would be reduced due to woody species encroachment and the reduced ground cover may decrease soil stability. In the long term, a combination of watershed health treatments (not proposed) would be required to reduce woody species canopy and shrub understory, as well as, to increase openings and create community types that produce desirable grass and forbs cover. Forage consumption by wildlife would also continue and may increase in utilization levels. Water yields would remain near existing levels. Water runoff timing and duration would increase from its existing level, as TES map unit ground cover percentages would decrease from their current percentage. Water quality may be affected and change from its current level towards higher sedimentation, as the amount and duration of surface water runoff would show change of an increase as herbage or ground cover decreases.

Future wildfire activity would alter vegetative conditions on moderate and high burn severity areas. Within the low burn severity or un-burned areas, positive response of understory vegetation would be expected. Increased levels of soil erosion, sediment delivery and water yield may be expected in drainage portions of the watershed area, depending upon success of rehabilitation prescribed treatments and the number and intensity of runoff producing storms. As vegetative recovery occurs, these additional areas of forage may also be utilized to improve livestock distribution across that specific allotment area.

Without wildfire, tree stands would deteriorate in health from bark beetle and mistletoe infestation (general locations of insect and disease are not known). In the short term, the increase of available forage that would benefit the improvement of distribution, pattern of use or utilization levels in key areas within various pastures would not occur. Adjustments to livestock numbers, period of use and pasture scheduling would be required, as the annual climate conditions varies from favorable to unfavorable forage production. In the long term, as overstory dies off, openings, grass and forbs would increase. Suitable best management practices would be applied to the varying existing forage conditions that would change as the overstory decreases. Range condition and trend would improve in relation to the specific areas and acres of openings. Desirable production would increase and percent frequency and cover of key species would be substantially higher. The increasing forage availability in under utilized areas would cause livestock to lower utilization levels in key areas, watering areas and favorite drainage areas or existing openings. At current livestock numbers, distribution would improve and the pattern of use would be more uniform. Wildfire effects would be dependent upon variability in stand structure, fuels, topography, and weather elements.

Wildlife (Terrestrial and Aquatic) and Plants [50, 57]

Federally Listed Threatened and Endangered Species

Threatened and endangered species are managed under the authority of the Federal Endangered Species Act (ESA), (PL 93-205, as amended in 1973) and the National Forest Management Act (PL 94-588). The ESA requires federal agencies to ensure that all actions, which they “authorize, fund, or carry out”, are not likely to jeopardize the continued existence of any T&E species. The black-footed ferret, interior least tern, southwestern willow flycatcher and Rio Grande silvery minnow did not warrant further analysis because habitat was not present, the habitat did not

support the species, or the forest was not within the range of the species (see wildlife and fisheries report for additional information). [57]

Significant Issues addressed in this analysis:

Significant Issue #1: Mule Deer, Elk and Black Bear early season nutritional needs. Use an entry date of July 15th for cattle in this high elevation allotment to assure recovery of cool season grasses which are one of the main nutritional needs for mule deer, elk and black bear.

Indicator used to measure effect: The indicator for the impacts to wildlife will be pasture condition and trend in terms of impact to plants during the cool season growth period.

Mexican spotted owl – (*Strix occidentalis lucida*) – Threatened

There are no critical habitat units for Mexican spotted owl (MSO) on the Tres Piedras Ranger District. Within the analysis area there is no PAC (Protected Activity Centers) or administratively reserved lands. There are approximately 116 acres of protected habitat within the allotment and the majority of the most suitable protected habitat is located on the Brokeoff pasture. Within the Brokeoff pasture the MSO suitable riparian habitat is found in TEU 66, 67 and 68 (USDA 1987). There is less than one acre of TEU 66; therefore it is not indicated on the map.

Formal surveys following regional protocol methodologies for the presence of this species have occurred on large portions of the forest since 1989. No MSO have been documented on the Tres Piedras Ranger District. On the Carson National Forest, the only located MSO with established territories, have been found occupying the Jicarilla Ranger District, approximately 75 air miles to the west of the Jawbone grazing allotment. No recent protocol MSO surveys have been conducted within the Jawbone grazing allotment. The closest and most recent formal surveys were conducted in 2002 and 2003 for the Maquinita Ecosystem Health project. At Maquinita, approximately 7,867 acres of protocol surveys were conducted and yielded negative results for MSO. There is no overlap between the Maquinita project boundary and the Jawbone allotment boundary. Even though no MSOs have been located within or adjacent to the allotment, for this analysis the assumption is made that Mexican spotted owls occupy the allotment based on the presence of suitable habitat.

Criteria Used to Measure Effects

To meet the needs of the owl and its prey, the following range/forage criteria was used to evaluate effects to MSO in the Brokeoff pasture. The purpose of establishing these criteria to ensure allowable use of plant species to maintain or improve plant diversity, density, vigor and regeneration over time to support MSO prey species.

Criterion 1: Upland meadow/grasslands

Criterion 1.1: Diversity of grassland plant community equal to 70 percent plant composition in cool season grasses within 5 years.

Criterion 1.2: Less than 15 percent woody species in upland meadows by year three, four and five.

Criterion 1.3: Less than 15 percent bare ground in upland meadow by year three, four and five.

Criterion 1.4: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Criterion 2: Vegetation long term trend of good to excellent range conditions in upland meadows and riparian areas adjacent to restricted and protected habitat

Criterion 3: Promote natural and healthy riparian plant communities

Criterion 1.1: More than 15 percent woody species where potential exists within 5 years.

Criterion 1.2: Less than 10 to 15 percent bare ground by year three.

Criterion 1.3: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Environmental Consequences:

Alternative 1

It is anticipated that there would be an increase in density of the vegetative species such as shrubs, forbs and grasses. The increased growth of these various vegetative species would result in plant diversity, cover and a variety of plant heights that equates to good to excellent range conditions, thus improve the habitat for prey base species for MSO. Under this alternative, criterion 1 through 3 would be met in 10 years.

Alternatives 2 and 3:

The AOI would include adjustments to livestock numbers, entry and exit dates, number of days and grazing system. These adjustments would reflect annual resource or climatic conditions and assist in making progress towards meeting criterion 1 through 3.

Implementation of these alternatives would permit managed livestock grazing on the Jawbone grazing allotment. Grazing management would include annual operating instructions (AOI'S). The AOI would include adjustments to livestock numbers, entry and exit dates, number of days and grazing system. These adjustments would reflect annual resource or climatic conditions and assist in making progress towards meeting criterion 1 through 3.

The grazing activities in the action alternatives would not directly remove nesting or roosting structural habitat characteristics required for the MSO. For instance, the overall canopy cover and forest structure would not change due to grazing, since livestock would not affect tree composition. However, indirectly livestock grazing may reduce the herbaceous ground cover and increases shrubs and small trees. This can decrease the potential for beneficial low-intensity ground fires while increasing the potential for destructive high-intensity vertical fires that can negatively affect nesting and roosting habitat (USDI 1995). However, the grazing activities are not anticipated to reduce the herbaceous ground cover to the point where there is a decreased potential of a low-intensity ground fire. There would not be increased potential for a destructive high-intensity vertical fire that would negatively affect MSO nesting and roosting habitat

The proposed livestock grazing in both alternatives is not anticipated to limit the diversity and seasonal availability of forage to support a diversity of prey species. There would be no change

that would result in owls leaving the area. The proposed grazing is anticipated to assist in increasing the current forage diversity and season availability over time.

To accommodate the needs of the owl and its prey species, “key grazing areas” are to be maintained in good to excellent range conditions. The implementation of the proposed activities and monitoring plan would assist in meeting adequate range conditions long term. Ensuring adequate residual cover during the growing season provides cover for MSO prey base. Again, it would be a goal to maintain forage utilization at conservative use levels within the open meadows and riparian habitat found on the pastures. This monitoring would be especially important in pastures that are grazed during the late spring and early summer months when avian species are rearing young and require a higher level of prey species.

In both alternatives, Brokeoff pasture would be rested to allow for alternating seasonal rest and recovery of forage production, primarily cool season grasses. In the long term, the upland meadow/grassland management requirements would be met and result in improved vegetation recovery and provide better forage diversity for prey species.

Range readiness to determine the entry dates on alternating pasture would translate to later entries of livestock to the MSO pasture (Brokeoff) when it is in rotation for a later entry date. Later entry dates in these pastures would allow a higher percentage of cool season grasses to seed out. Grasses would respond to additional cool growing season rest by increasing root and leaf volume, annual production, seedling establishment, reproduction and vigor. Overall, this would allow for greater forage diversity and cool season seed sources in the long and short term for MSO prey base species.

The proposed grazing system would result in improved livestock utilization and range conditions allotment wide. This would include improving these measures on the Brokeoff pasture, where suitable MSO habitat is found. In the short and long term, as cool season herbage increases due to entry pasture management and pasture rest (grazing system), livestock would be grazing slightly used areas more often than during previous years, as well as, heavy use areas less often, and would generate a more uniform pattern of use that would make progress towards meeting the utilization objectives. Slight to moderate positive impacts to the utilization level within the key areas would occur because of the flexible management grazing system, growing season rest, and season of use. In the long term, conservative livestock grazing of 30 to 40 percent allowable utilization on the allotment including the Brokeoff pasture would expedite attaining good to excellent range conditions. Long term range condition trends would also be expected to stabilize and begin to show indicators to moving upward. The management requirements would be met for upland meadows. In riparian areas (headwaters intermittent drainages of the Rio Tusas), the management requirements are currently being met. With conservative utilization being proposed, the riparian desired conditions would be maintained and/or improved and this would support prey base species diversity for owls

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization and distribution within the Brokeoff pasture riparian areas and upland meadows. In the long term, this would contribute to greater diversity of grass species and less percentages of bare ground in these areas. These conditions would be favorable for MSO prey base species. Criterion 1 through 3 would be met.

Forest Sensitive Species

There are 47 species on the Regional Forester's Sensitive Species list that potentially occur on the Carson National Forest. Reference was made to the Carson National Forest TEP&S list, dated 3/05/2008 [57] was used to determine which species are located on the Tres Piedras Ranger District. No further analysis was warranted on these species: American peregrine falcon, white-tailed ptarmigan, New Mexican meadow jumping mouse, small-head golden weed, Arizona willow, western boreal toad, yellow-billed cuckoo, pika, yellow-bellied marmot, tufted sand verbena and burrowing owl. Because no alternative would affect the southern red-backed vole, snowshoe hare or bald eagle no further discussion occurs. Please refer to the wildlife specialist report in the project record for additional information. [57]

A review of the distribution for other sensitive aquatic species included bluehead sucker, flannelmouth sucker, roundtail chub and speckled dace. These species do not warrant further analysis due to a lack of habitat. Habitat ranges for these species include the San Juan (the closest habitat is within the San Juan drainage), Little Colorado River and Gila drainages. (Biotic Information System of New Mexico 2007) (Sublette and Hatch 1990). Please refer to the aquatics specialist report for additional information. [50]

Significant Issues addressed in the aquatic Forest Sensitive Species analysis:

Significant Issue #2: Loss of Quality Cold Water Fisheries. The upper Vallecitos, Tusas Creek and Little Tusas (Rincon Negro) should be monitored for properly functioning condition with regards to riparian zones and livestock. The loss of quality cold water fisheries is the main issue.

Indicator used to measure effects: Impacts to aquatic habitat and fisheries is evaluated using percent sediment, stream temperature and percent streambank stability.

Aquatic Forest Sensitive Species

To meet the needs of the northern leopard frog, water shrew, Rio Grande cutthroat, Rio Grande chub, Rio Grande sucker and their prey base, the goal is to maintain the following aquatic habitat criteria within suitable aquatic habitat:

Criterion 1: Percentage of fine sediment - Sediment does not exceed 20 percent to support northern leopard frog and water shrew prey base, Rio Grande cutthroat, Rio Grande chub and Rio Grande suckers.

Placer Creek provides perennial stream habitat for 4 miles in the Hopewell pasture. The stream is divided into reaches. Reaches 1, 2 and 3 are below Hopewell Lake and a portion of reach 6 is from the Hopewell Lake to State Highway 64. A portion of reach 6 (about .25 mi.) of Placer Creek within the Hopewell Recreation Area is excluded from the Jawbone allotment. An enclosure fence is partially constructed and will be completed in the future (see table 3 for foreseeable actions). This reach of Placer Creek has been impacted from grazing. Streambanks are trampled and there is little riparian vegetation. This results in increased sedimentation. The 2002 stream inventory report indicates it is not properly functioning for sediment. The piece of the stream within the Hopewell Recreation Area is only a small segment of reach 6 and is not separated out in the report. However, impacts to this 0.25 mile area of Placer Creek have resulted in poor quality habitat within the 0.25 mile.

Approximately 1.5 miles of Placer Creek between the confluence with the Rio Vallecitos and private mining land below Hopewell Lake (reaches 1, 2 and 3) is not properly functioning for sediment levels throughout the reaches. Sediment ranges from 21 to 24 percent and is mainly attributed to recreational mining, roads and crossings and periodic low flows associated with climatic conditions.

The Rio Vallecitos flows for about 2.6 miles through the Hopewell pasture. There is no stream habitat inventory for this stream. Field observations conducted along the Rio Vallecitos in 2007 indicated that livestock grazing was not excessively impacting streambanks and sediment did not appear to be excessive. Some sites of unstable banks and excessive sediment were observed but overall criteria appear to be met for streambank stability and sediment. There is no FS temperature data available.

Riparian assessments (2007), conducted by range specialists note streambank trampling and shearing at road crossings and woody riparian vegetation present and lightly browsed. Sediment is also noted along trailing areas. Riparian vegetation is noted to shade about 40 percent of the stream surface. This may provide adequate shade to meet temperature criteria. The range specialist report states the Hopewell pasture is in fair to good condition with a long term stable trend. There are no roads adjacent to the Rio Vallecitos although there are some road crossings. Road crossings likely contribute some sediment to the stream both from livestock trailing and vehicular use. Based on the uplands condition, field observations and limited cumulative impacts, the Rio Vallecitos appears to provide suitable habitat based on the criteria for streambank stability, sediment and temperature.

The Rio Tusas flows through the La Manga and Brokeoff pastures for about 4 miles. There are no stream habitat inventories or multiple pass depletion surveys available for this stream. The stream is on Forest Service managed lands (not within private lands) and there are no roads adjacent to the Rio Tusas. Roads and private land uses can contribute sediment to streams and degrade the condition of stream habitat.

Riparian assessments (2007), conducted by range specialists, within the Brokeoff pasture, note shearing and trampling of banks in a very limited area, woody riparian vegetation with light grazing use and trailing only outside of the riparian area. Stream shading covers about 20 percent of the stream surface area. Although stream inventory data is not available, based on the range condition, riparian assessment and limited cumulative impacts, it is likely that stream condition criteria are being met and habitat is good.

The Little Tusas flows through the Brokeoff pasture for about 3 miles. There are no stream habitat inventories or multiple pass depletion surveys available for this stream. The Brokeoff pasture is in good condition with a stable long term trend. The majority of the stream (2.5 miles) has no road adjacent to it. The stream is on Forest Service managed lands (not within private lands). Roads and private land uses often contribute sediment to streams and degrade the quality of habitat. Although stream inventory data is not available, based on the range condition and limited cumulative impacts, it is likely that stream condition criteria are being met and habitat is good.

Criterion 2: Maintain and/or improve habitat for prey species for the water shrew and northern leopard frog (macroinvertebrates).

Criterion 3: Streambank Condition - There is less than 10 percent unstable banks for the water shrew, northern leopard frog, Rio Grande cutthroat, Rio Grande chub and Rio Grande suckers.

Placer Creek: A portion of reach 6 (about 0.25 mi.) of Placer Creek is not properly functioning for both streambank stability and sediment (2002 Stream Inventory Report). The range specialist report notes the Hopewell pasture is in fair to good condition with a long term stable trend. Based on upland conditions and the stream inventory report, reaches 1, 2 and 3 of Placer Creek are somewhat degraded from sediment but meeting the criteria for streambank stability and likely temperature. Habitat condition is good but could be improved with a reduction in sediment.

Rio Vallecitos: Based on the uplands condition, field observations and limited cumulative impacts the Rio Vallecitos appears to provide suitable habitat based on the criterion for streambank stability, sediment and temperature.

Rio Tusas: Based on the range condition, riparian assessment and limited cumulative impacts, it is likely that stream condition criterion are being met and habitat is good.

Little Tusas: Although stream inventory data is not available, based on the range condition and limited cumulative impacts, it is likely that stream condition criterion is being met and habitat is good.

Criterion 4: Trampling – Reduce impacts to northern leopard frog egg masses from April to July (Pagels et al 1998) by minimizing trampling.

Criterion 5: Stream temperature– Temperature does not exceed 20 degrees C one time or less than 20 degrees centigrade for 4 consecutive hours over 4 consecutive days (USDA Forest Service 2003) for Rio Grande cutthroat, Rio Grande chub and Rio Grande suckers.

Placer Creek: A portion of reach 6 (about 0.25 mi.) of Placer Creek has been impacted from grazing. Temperature data (2002 Stream Inventory Report) is not available but this 0.25 mile is likely exceeding criteria due to the lack of riparian vegetation. This section of the stream within the Hopewell Recreation Area is only a small segment of reach 6 and is not separated out in this analysis. However, impacts to this 0.25 mile area of Placer Creek have resulted in poor quality habitat for trout within the 0.25 mile.

The range specialist report notes the Hopewell pasture is in fair to good condition with a long term stable trend. Based on upland conditions and the stream inventory report, reaches 1, 2 and 3 of Placer Creek are somewhat degraded from sediment but likely meeting the temperature criteria. Habitat condition is good in these segments but could be improved with a reduction in sediment.

Rio Vallecitos: Based on the uplands condition, field observations and limited cumulative impacts the Rio Vallecitos appears to provide suitable habitat based on the criteria for streambank stability, sediment and temperature.

Rio Tusas: Based on the range condition, riparian assessment and limited cumulative impacts, it is likely that stream condition criterion is being met and habitat is good.

Little Tusas: Although stream inventory data is not available, based on the range condition and limited cumulative impacts, it is likely that stream condition criterion is being met and habitat is good.

Northern leopard frog and water shrew

No surveys have been conducted for northern leopard frog. It is not known whether leopard frogs occur on the Jawbone grazing allotment. Small mammal surveys were conducted in 2003 on the forest (Frey 2003). This survey did not yield any water shrews in the areas surveyed with the allotment. It is not known whether water shrews occur on the allotment. Suitable habitat for water shrew and northern leopard frog includes 0.7 miles of the Canada Tio Grande, 2.6 miles of the Rio Vallecitos, 4.0 miles of Placer Creek, 4.5 miles of the Rio Tusas, 3.0 miles of the Little Tusas Creek and the associated ephemeral wetlands and spring-fed stock tanks that holds water year-round.

Environmental Consequences

Alternative 1 – Northern leopard frog and water shrew

With no grazing, stream habitat conditions would be expected to improve. Criterion 1 through 4 in the Rio Vallecitos, Rio Tusas and Little Tusas would be met. In the short term, with no livestock grazing, overall range condition and trend would improve in all pastures (see rangeland vegetation report). However, range condition may not fully reach excellent in the long term due to use by elk. Overall, stream habitat conditions in these streams are (currently) likely exceeding the criteria for amount of sediment and streambank stability. It is likely that with no livestock grazing conditions would improve over the existing level. The actual degree to which criteria would be met or improved is unknown due to a lack of baseline information on the percent of sediment and streambank condition (see monitoring section of the EA). The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

Placer Creek between the confluence with the Rio Vallecitos and the private mining land below Hopewell Lake (reaches 1, 2 and 3) is currently meeting the criterion for streambank stability. Sediment is exceeded by 1 to 4 percent in these reaches. The major source of sediment is attributed to recreational mining, roads and road crossings, and periodic low flows. The elimination of grazing would improve range condition and trend in the short term but may not achieve excellent condition in the long term due to use by elk (range specialist report). It is likely that there would be some reduction in the amount of stream sediment; but since other sources are major contributors, criterion may not be met. Criterion for streambank stability and temperature would likely continue to be met and show some improvement in the long term as riparian vegetation increases. The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

A portion of reach 6 of Placer Creek (about 0.25 mi.) within the Hopewell Recreation Area is excluded from the Jawbone allotment. The construction of the fence (reasonably foreseeable action in 2009 and 2010) and elimination of grazing on the allotment and along this portion of reach 6 should eliminate streambank trampling and use of riparian vegetation by livestock. This would improve streambank stability and reduce sediment in the long term. Upland range conditions and trend would also improve in the short term but may not achieve excellent condition in the long term due to use by elk (range specialist report). However, it is unlikely that elk concentrate in this reach since it is between a high recreation use area and a highway.

Alternatives 2 and 3– Northern leopard frog and water shrew

With the implementation of these alternatives, stream habitat conditions would be expected to improve in the Rio Vallecitos, Rio Tusas and Little Tusas. Stream habitat conditions in these

streams overall are not now likely exceeding the criterion for amount of sediment and streambank stability.

On an annual basis, livestock numbers may be adjusted to respond to resource conditions. Management actions such as moving livestock out of riparian areas, reducing livestock numbers, and salting away from waters would result in maintaining or improving stream habitat conditions, if successfully implemented. It is anticipated that the Brokeoff and Hopewell pastures would remain in fair to good condition. This would also reduce any indirect sources of sediment that may occur from the uplands entering the streams. The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

A portion of reach 6 of Placer Creek (about 0.25 mi.) within the Hopewell Recreation Area is excluded from the Jawbone allotment. The construction of the fence (reasonably foreseeable action in 2009 and 2010) should eliminate streambank trampling, the trampling effects to the leopard frog egg masses and use of riparian vegetation by livestock. This would improve streambank stability and reduce sediment in the long term. Macroinvertebrate prey base for water shrews and leopard frogs would also be expected to improve.

In addition, overall range condition in the Hopewell pasture would remain in fair to good condition. This would also reduce any indirect sources of sediment that may occur from the uplands entering the streams. Placer Creek between the confluence with the Rio Vallecitos and the private mining land below Hopewell Lake (reaches 1, 2 and 3) is meeting the criterion for streambank stability. Sediment is exceeded by 1 to 4 percent in these reaches. The major source of sediment is attributed to recreational mining, roads and road crossings and periodic low flows.

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization within the stream and riparian areas. In the long term, this would contribute to improve to less sediment, greater bank stability and less trampling effects. These conditions would be favorable for the northern leopard frog and water shrew. Criterion 1 through 4 would be met. The improvement in sediment would also improve macroinvertebrate prey base. Criterion 2 would be met. The implementation of alternative 2 and 3 has potential to impact individual leopard frogs and water shrews. However, would not have a measurable negative effect to their populations.

Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker

A stream habitat inventory was completed on Placer Creek (USDA Forest Service, 2002). Reaches 1, 2 and 3 of Placer Creek are below Hopewell Lake and a portion of reach 6 is from the Hopewell Lake to State Highway 64. Multiple pass depletion surveys (1995) indicate the presence Rio Grande chub (and other non-sensitive species such as rainbow trout and brook trout). See the narrative in the criteria above for information on habitat conditions.

The Rio Vallecitos flows for about 2.6 miles through the Hopewell pasture. Multiple pass depletion surveys (2003) indicate the presence of Rio Grande suckers. Population estimates are not calculated for non game species (suckers).

The Rio Tusas flows through the La Manga and Brokeoff pastures for about 4 miles. There are no stream habitat inventories or multiple pass depletion surveys available for this stream. Rio Grande sucker presence was documented by Calamusso (2002). The headwaters of Rio Tusas contained

Rio Grande cutthroat trout when spot sampled in 1990 and 1994. The stream is on Forest Service managed lands (not within private lands).

The Little Tusas flows through the Brokeoff pasture for about 3 miles. There are no stream habitat inventories or multiple pass depletion surveys available for this stream

Alternative 1 - Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker

With no grazing, stream habitat conditions would be expected to improve in the Rio Vallecitos, Rio Tusas and Little Tusas. The range specialist report states that in the short term, with no livestock grazing, overall range condition and trend would improve in all pastures. The specialist report also indicates that range condition may not fully reach excellent in the long term due to use by elk. Stream habitat conditions in these streams overall are not now likely exceeding the criteria for amount of sediment, streambank stability and temperature. It is likely that with no livestock grazing conditions would improve over the existing level and site specific areas impacted would heal. The actual degree to which criteria would be met or improved is unknown due to a lack of baseline information on the percent of sediment, stream temperature and streambank condition (see monitoring section of the EA). The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

Placer Creek between the confluence with the Rio Vallecitos and the private mining land below Hopewell Lake (reaches 1, 2 and 3) is meeting the criteria for streambank stability and likely temperature. Sediment is exceeded by 1 to 4 percent in these reaches. The major source of sediment is attributed to recreational mining and periodic low flows. The elimination of grazing would improve range condition and trend in the short term but may not achieve excellent condition in the long term due to use by elk (range specialist report). It is likely that there would be some reduction in the amount of stream sediment but since other sources are major contributors, criterion may not be met.

Criterion for streambank stability and temperature would likely continue to be met and show some improvement in the long term as riparian vegetation increases. Site specific areas of damage would heal. The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

A portion of reach 6 of Placer Creek (about 0.25 mi.) within the Hopewell Recreation Area is excluded from the Jawbone allotment. The construction of the fence (reasonably foreseeable action in 2009 and 2010) and elimination of grazing on the allotment and along this portion of reach 6 should eliminate streambank trampling and use of riparian vegetation by livestock. This would improve streambank stability and reduce sediment in the long term. As riparian vegetation recovers, it is likely that temperatures would be reduced from shading. Upland range conditions and trend would also improve in the short term but may not achieve excellent condition in the long term due to use by elk (range specialist report). It is unlikely that elk concentrate in this reach since it is between a high recreation use area and a highway. In the long term, as habitat conditions improve, there may be increased numbers of fish in this 0.25 mile reach due to the proximity of Hopewell Lake which contains both resident and stocked fish.

Alternatives 2 and 3 - Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker

In these alternatives, stream habitat conditions would be expected to improve in the Rio Vallecitos, Rio Tusas and Little Tusas. Stream habitat conditions in these streams (overall) are not now likely exceeding the criteria for amount of sediment, streambank stability, and temperature. On an annual basis, livestock numbers may be adjusted to respond to resource conditions. Management actions such as moving livestock out of riparian areas, reducing livestock numbers, and salting away from waters would result in maintaining or likely improving stream habitat conditions, if successfully implemented. It is anticipated that the Brokeoff and Hopewell pastures would remain in fair to good condition. This would also reduce any indirect sources of sediment that may occur from the uplands entering the streams. The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

A portion of reach 6 of Placer Creek (about 0.25 mi.) within the Hopewell Recreation Area is excluded from the Jawbone allotment. The construction of the fence (reasonably foreseeable action in 2009 and 2010) should eliminate streambank trampling and use of riparian vegetation by livestock. This would improve streambank stability and reduce sediment in the long term. As riparian vegetation recovers, it is likely that temperatures would be reduced from shading.

In addition, overall range condition in the Hopewell pasture would remain in fair to good condition. This would also reduce any indirect sources of sediment that may occur from the uplands entering the streams. In the long term, as habitat conditions improve, there may be increased numbers of fish in this 0.25 mile reach due to the proximity of Hopewell Lake (which contains both resident and stocked fish).

Placer Creek between the confluence with the Rio Vallecitos and the private mining land below Hopewell Lake (reaches 1, 2 and 3) is meeting the criterion for streambank stability and likely temperature. Sediment is exceeded by 1 to 4 percent in these reaches. The major source of sediment is attributed to recreational mining and periodic low flows. In these alternatives, the criterion for sediment would be expected to remain the same or improve slightly. Hopewell pasture would be in fair to good condition and this would reduce any indirect sources of sediment that may occur from the uplands entering the streams. In addition, adjustments to livestock numbers, moving livestock out of riparian areas, salting away from water, and other grazing management actions would reduce sediment resulting from livestock grazing. This would maintain or improve streambank stability and reduce temperatures. As riparian vegetation increases, streambanks would stabilize and stream temperature would be reduced. Streambank stability and likely temperature are meeting criteria. Sediment may improve slightly. The effect to populations may be no change or a slight increase in these streams due to improved stream habitat conditions.

Riparian Forest Sensitive Species

Riparian includes the Placer Creek, Rio Tusas, Little Tusas and Rio Vallecitos. Field observation (Rio Vallecitos) and riparian assessments do not indicate (overall) that areas of concern exist in either the Rio Vallecitos or Rio Tusas. Although no data exists for the Little Tusas, range specialists indicate there are no overall areas of concern. Placer Creek between the confluence with the Rio Vallecitos and private land below Hopewell Lake is not properly functioning for sediment levels throughout the stream. Also from field observation, the intermittent drainages

within the Rio Tusas area have shown some limited localized impacts by livestock. Overall, riparian conditions within this area appear to be good and not degraded.

Cinereus (masked) shrew: Grazing by both livestock and wildlife can alter function and composition of moist areas through trampling and reduction in height and density of vegetation. Excessive grazing can reduce height and density of vegetation limiting the amount of cover for this species against predators and for their prey (insects) (DeLong 2000).

Spotted bat: Livestock grazing has been responsible for large-scale conversion of mesic riparian habitats to xeric uplands throughout the west. Conversion of wetlands, wet meadows, or spring overflow areas to xeric sites by draining these sites, lowering the water table, or overgrazing by livestock, all of which reduce the amount of clean, open water, has the potential to adversely impact spotted bats (Luce and Keinath 2007).

Pale Townsend's big-eared bat: Activities that reduce the productivity of wetlands likely impact local populations of the Townsend's big-eared bat by reducing the quality of important foraging and drinking sites. The alteration of surface and subsurface hydrology of wetlands and removal of shrub and overstory vegetation ultimately reduce the value of wetlands to this species (Gruver et al 2006).

Long-tailed vole: Grazing activities affect long-tailed voles by reducing herbaceous cover such as grasses, sedges and forbs within riparian and upland meadow/grasslands and at the edge of conifer stands.

Mink: Fire, modification to water ways, logging and livestock/wildlife grazing are the major threats to mink (Bison-M 2006). These activities (fire, logging and grazing) result in the reduction of cover near water ways (Sullivan 1996). The reduction of cover may also indirectly affect the availability of prey as well through loss of pools for aquatic prey and loss of vegetation cover for rodents.

Nokomis fritillary: Short-term negative impacts from grazing include reduced nectar availability and vegetation cover and long-term impacts include soil compaction and reduced water infiltration, which can lead to a loss of larval host plants and invasion of by non-native grasses. While excessive grazing can be a serious threat to the butterfly, light or moderate grazing may in fact offer the violet a competitive advantage (Selby 2007).

Dwarf shrew: Management practices in Bison M (2006) note that dwarf shrews are tolerant to clear-cutting and grazing.

Western heather vole: Grazing activities affect western heather voles by reducing herbaceous cover such as grasses, sedges and forbs within riparian and upland meadow/grasslands and at the edge of conifer stands.

Ermine: Ermine are associated with upland meadows. Ermines are probably vulnerable to the effects of livestock grazing on vegetation which affect hiding cover; small mammal prey may be secondarily affected.

Northern goshawk: Formal surveys for the goshawks have been conducted throughout the Tres Piedras Ranger District for vegetation management projects and timber stand improvement projects. The surveys have yielded two nesting pairs outside the allotment. No recent surveys

have been conducted with the allotment. Livestock grazing may affect northern goshawk by reducing herbaceous cover for prey species within riparian zones adjacent to forested habitat that is use for nesting.

Survey Status: Small mammal surveys were conducted forestwide within the Carson National Forest in 2003. No New Mexico meadow jumping mice, masked shrews, minks or dwarf shrews were documented in this area (Frey 2003). Long tailed voles were recorded at this location. Ermine are likely to occur in the area. No surveys for Nokomis fritillary have been conducted within the allotment. It is not known whether they occur within the allotment. In addition, no surveys for both bat species have been conducted.

Criteria to Measure Effects:

To meet the needs of the riparian forest sensitive species, the goal is to maintain the following riparian condition criteria on the Jawbone allotment. The purpose of establishing these criteria is to ensure allowable use of plant species to maintain or improve plant diversity, density, vigor and regeneration over time to support the riparian Forest Service sensitive species:

Criterion 1: Vegetation long term trend of good to excellent range conditions in riparian areas.

Criterion 2: Promote natural and healthy riparian plant communities.

Criterion 2.1: More than 15 percent woody species where potential exists within 5 years.

Criterion 2.2: Less than 10 to 15 percent bare ground by year three.

Criterion 2.3: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Environmental Consequences:

Alternative 1

It is anticipated that there would be an increase in density of the vegetative species such as shrubs, forbs and grasses. The increased growth of these various vegetative species would result in plant diversity, cover and a variety of plant heights that equates to favorable riparian habitat conditions for the riparian forest sensitive species. More cover and foraging opportunities would exist for these species under this alternative. Criterion 1 and 2 would be met within 10 years.

Alternative 2 and 3

The AOI would include adjustments to the livestock numbers, entry and exit dates, number of days and grazing system. These adjustments would reflect annual resource or climatic conditions and assist in making progress towards meeting the desired conditions for the riparian Forest Service sensitive species. Desired conditions include maintaining or improving plant diversity, density, vigor and regeneration over time..

Livestock forage utilization may impact riparian forest sensitive habitat found at the riparian areas. Livestock forage utilization can cause changes in plant species diversity and vegetation structure (Rickel 2005). Decreases in forage diversity would impact the riparian species diversity by limiting the diversity and seasonal availability of forage (seed sources) over the duration of the growing season. The proposed livestock grazing is not anticipated to limit the diversity and seasonal availability of forage to support a diversity of riparian forest sensitive species. The

proposed grazing is anticipated to assist in increasing forage diversity and seasonal availability of forage and cover over time. This includes providing nectar producing plants for the Nokomis fritillary. In riparian areas criterion 2 is mostly being met. A greater percentage of woody species would be desired. With the conservative utilization being proposed, the riparian desired conditions would be maintained and/or improved and this would support habitat for the riparian forest sensitive species.

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization in the riparian areas. In the long term, this would contribute to greater diversity of grass species, less percentages of bare ground, and a higher percentage of woody species in these areas. These conditions would be favorable for riparian forest sensitive species. For the small mammals, this would translate into better forage and cover. For the bats, this would translate into better conditions to support insect (moth) prey base. For the ermine, northern goshawk and mink, this would translate into more prey base (small mammals) diversity. For the Nokomis fritillary, this would translate into more nectar producing plants. Criterion 1 and 2 would be met. The implementation of alternative 2 has potential to impact individual forest sensitive riparian species. However, it would not have a measurable negative effect to their populations.

Predatory Forest Sensitive Species

American marten: There is approximately 5,015 acres of blue spruce and Engelmann spruce, with upland meadows intermixed. The forested habitat is the primary habitat for the pine marten that provides den sites as well as primary foraging habitat. The edge habitat (forested edge/upland meadow interface) may provide secondary foraging habitat for the pine marten where it preys on a variety of prey species.

American marten surveys conducted on the CNF from 1997 to 2001 in close proximity to the allotment included the San Antonio Mountain survey (Long 2001). These surveys yielded negative findings for marten. No surveys have been conducted within the allotment. Livestock grazing may affect marten by reducing herbaceous cover for prey species within upland meadows and at the edge of conifer stands.

Ermine: See details in “Riparian Forest Sensitive Species” section (above).

Northern goshawk: See details in “Riparian Forest Sensitive Species” section (above).

Boreal owl: Nesting and foraging areas for the boreal owl are limited to approximately 5,015 acres of potential habitat within the allotment of combined habitats such blue spruce and Engelmann spruce. Where upland meadows/grasslands are adjacent to mature or old spruce fir habitat for the boreal owl, these areas could be used for foraging during the spring and summer (see appendix A in the specialist report for additional information). Surveys were conducted approximately 10 miles northwest of the allotment. Boreal owls were found (Stahlecker 1987). Their status is not known on the allotment. Livestock grazing may affect the boreal by reducing herbaceous cover for prey species within upland meadows that are adjacent to mature or old spruce fir habitat.

Criteria to Measure Effects

To meet the needs of the predatory forest sensitive species, the goal is to maintain the following range and forage criteria on the upland meadows within the allotment:

Criterion 1: Upland meadow/grasslands

Criterion 1.1: Diversity of grassland plant community equal to 70 percent plant composition in cool season grasses within 5 years.

Criterion 1.2: Less than 15 percent woody species in upland meadows by year three, four and five.

Criterion 1.3: Less than 15 percent bare ground in upland meadow by year three, four and five.

Criterion 1.4: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Criterion 2: Vegetation long term trend of good to excellent range conditions in upland meadows

Environmental Consequences

Alternative 1

It is anticipated that there would be an increase in density of the vegetative species such as shrubs, forbs and grasses. The increased growth of these various vegetative species would result in plant diversity, cover and a variety of plant heights that equates to good to excellent range conditions. This would improve the habitat for prey base species for the predatory forest sensitive species. Under this alternative, criterion 1 and 2 would be met in 10 years.

Alternative 2 and 3

The AOI would include adjustments to livestock numbers, entry and exit dates, number of days and grazing system. These adjustments would reflect annual resource or climatic conditions and assist in making progress towards meeting the desired conditions for the predatory forest sensitive species. This includes the American marten, ermine, northern goshawk and boreal owl.

Implementation of these alternatives could impact predator prey species diversity and abundance (for the same reasons as described under these alternatives for MSO). Although the prey species are different than MSO prey species; the prey species will utilize the same upland meadows that are described for the Mexican spotted owl.

The grazing activities in these alternatives would not directly remove the structural habitat characteristics required for the predatory forest sensitive species within the Jawbone allotment. For instance, the overall canopy cover and forest structure would not change due to grazing, since livestock would not affect tree composition. The marten, boreal owl and northern goshawk nesting/denning habitat would not be affected. However, indirectly, livestock grazing may reduce the herbaceous ground cover and increase shrubs and small trees. This can decrease the potential for beneficial low-intensity ground fires while increasing the potential for destructive high-intensity vertical fires. This can negatively affect denning/nesting and roosting/resting habitat (USDI 1995). However, the proposed grazing activities under alternative 2 and 3 are not anticipated to reduce the herbaceous ground cover to the point where there is a decreased potential of a low-intensity ground fire. Low intensity ground fire decreases the potential for a

destructive high-intensity vertical fire that would negatively affect the structural habitat such trees, logs and snags that are use by these predator species.

Grazing activities may affect the availability and diversity of prey. Livestock forage utilization may impact prey base species habitat (foraging habitat) found in the upland meadows. Livestock forage utilization can cause changes in plant species diversity and vegetation structure and influence rodent species diversity (Rickel 2005). Decreases in forage diversity would impact the predatory forest sensitive prey base species diversity by limiting the diversity and seasonal availability of forage (seed sources) over the duration of the growing season. On the Jawbone grazing allotment, the proposed livestock grazing is not anticipated to limit the diversity and seasonal availability of forage that supports a diversity of prey species. There would be no change that would result in predatory species leaving the area. The proposed grazing is anticipated to assist in increasing the current forage diversity and season availability over time.

Under the action alternatives, the pastures would be rested to allow for alternating seasonal rest and recovery of forage production, primarily cool season grasses. In the long term, in the upland meadow/grasslands, criterion 1.1 would be met and would result in improved vegetation recovery. It would provide better forage diversity for prey species.

Range readiness would determine the entry dates on alternating pasture. This would translate to later entries of livestock onto the upper elevation pastures when it is in rotation for a later entry date. Later entry dates in these pastures would allow a higher percentage of cool season grasses to seed out. Grasses would respond to additional cool growing season rest by increasing root and leaf volume, annual production, seedling establishment, reproduction and vigor. Overall, this would allow for greater forage diversity and cool season seed sources in the long and short term for prey base species such as ermine, northern goshawk, boreal owl and American marten.

The proposed grazing system in both alternatives would result in improved livestock utilization and range conditions allotment wide. In the short and long term, cool season herbage would increase due to entry pasture management and pasture being rested. Livestock would be grazing lightly used areas more often (than during previous years) and would graze heavily used areas less often. This would generate a more uniform pattern of use that would make progress towards meeting the utilization objectives. Slight to moderate positive impacts to the utilization level within the key areas would occur because of the flexible management grazing system, growing season rest, and season of use. In the long term, conservative livestock grazing of 20 to 40 percent allowable utilization on the allotment would expedite attaining good to excellent range conditions. Criterion 1.4 would be met for upland meadows.

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization within the upland meadows. In the long term, this would contribute to greater diversity of grass species and less percentages of bare ground in these areas. These conditions would be favorable for ermine, northern goshawk, boreal owl and American marten prey species. Criterion 1 and 2 would be met. The implementation of alternative 2 and 3 has potential to impact individual forest sensitive predatory species. However, neither alternative would have a measurable negative effect to their populations.

Upland Meadow Forest Sensitive Species

White-tailed jackrabbit: Livestock grazing may affect the white-tailed jackrabbit by competing for succulent plants.

Gunnison’s prairie dog: Despite the extensive grasslands on Carson National Forest, prairie dogs were very uncommon during the Carson Small Mammal Survey in 2003 (Frey 2003). All observations of prairie dogs were on the west side of the forest (including this allotment). Historic levels of livestock grazing impacted the prairie dog’s range by disrupting the ecosystem and drastically altering the landscape.

Ermine: See details in “Riparian Forest Sensitive Species” section (above).

Dwarf shrew: See details in “Riparian Forest Sensitive Species” section (above).

Survey Status: Small mammal surveys were conducted forestwide within forest in 2003. No white-tailed jackrabbits or dwarf shrews were documented in this area (Frey 2003). Gunnison’s prairie dogs were recorded on the west side districts of the forest and are believed to be found in small scattered colonies. Ermine are likely to occur in the area. On the Jawbone grazing allotment there are approximately 7,436 acres of upland meadow or grassland that may provide habitat for the upland meadow forest sensitive species. See Appendix A of the wildlife report for additional information. [57]

Criteria to Measure Effects

To meet the needs of the upland meadow forest sensitive species, the goal is to maintain the following range/forage criteria on the upland meadows within the allotment:

Criterion 1: Upland meadow/grasslands

Criterion 1.1: Diversity of grassland plant community equal to 70 percent plant composition in cool season grasses within 5 years.

Criterion 1.2: Less than 15 percent woody species in upland meadows by year three, four and five.

Criterion 1.3: Less than 15 percent bare ground in upland meadow by year three, four and five.

Criterion 1.4: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Criterion 2: Vegetation long term trend of good to excellent range conditions in upland meadows

Currently all the pastures are in fair condition (not meeting criterion 2). The Brokeoff pasture is meeting criterion 2. The next table displays how criterion 1.1 through 1.4 is being met by pasture.

Table 6. Upland Meadow Habitat Condition

Pasture	Criterion Met	Criterion Not Met
Brokeoff	1.1, 1.2, 1.3, 1.4	N/A
Hopewell	1.1, 1.2, 1.3, 1.4	N/A
La Manga	1.2	1.1, 1.3, 1.4
Gavilan	1.1, 1.2, 1.4	1.3

Environmental Consequences

Alternative 1

It is anticipated that there would be an increase in density of the vegetative species such as shrubs, forbs and grasses. The increased growth of these various vegetative species would result in plant diversity, cover and a variety of plant heights that equates to good to excellent range conditions. This would improve the foraging habitat for the Gunnison prairie dog and white-tailed jackrabbit. The increased growth in herbaceous cover would benefit the dwarf shrew and ermine prey species. Under this alternative, criterion 1 and 2 would be met in 10 years.

Alternative 2 and 3

The AOI would include adjustments to livestock numbers, entry and exit dates, number of days and the grazing system. These adjustments would reflect annual resource or climatic conditions and assist in making progress towards meeting the desired conditions on the upland meadows within the allotment. This would support the white-tailed jackrabbit, Gunnison's prairie dog, burrowing owl, ermine, and dwarf shrew.

Under the action alternatives, the pastures would be rested to allow for alternating seasonal rest and recovery of forage production, primarily cool season grasses. In the long term, in the upland meadow/grassland, criterion 1.1 would be met. There would be improved vegetation recovery and better forage diversity for upland meadow dependent species.

Range readiness to determine the entry dates on alternating pasture would translate to later entries of livestock to the upper elevation pastures when it is in rotation for a later entry date. Later entry dates in these pastures would allow a higher percentage of cool season grasses to seed out. Grasses would respond to the additional cool growing season rest by increasing root and leaf volume, annual production, seedling establishment, reproduction and vigor. Criterion 1.1 would be met. Overall, this would allow for greater forage diversity in the long and short term for white-tailed jackrabbit and Gunnison's prairie dog. Greater forage diversity would benefit ermine prey species.

The proposed grazing system in both alternatives would result in improved livestock utilization and range conditions allotment wide. In the short and long term, as cool season herbage increases (due to entry pasture management and pasture get rest (grazing system)), livestock would be grazing lightly used areas more often than during previous years and graze heavily used areas less often. This would generate a more uniform pattern of use that would make progress towards meeting the utilization objectives. Slight to moderate positive impacts to the utilization level within the key areas would occur because of the flexible management grazing system, growing

season rest and season of use. In the long term, conservative livestock grazing of 20 to 40 percent allowable utilization on the allotment would expedite attaining good to excellent range conditions. Criterion 1.4 would be met for upland meadows.

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization the upland meadows. In the long term, this would contribute to greater diversity of grass species and less percentages of bare ground in these areas. These conditions would be favorable for white-tailed jackrabbit and Gunnison's prairie dog. A greater diversity of grass species would be beneficial to the ermine prey species. Criterion 1 and 2 would be met. The adaptive management actions would not affect the dwarf shrew. The implementation of alternative 2 and 3 has potential to impact individual forest sensitive upland meadow species. However, would not have a measurable negative effect to their populations.

Forest Sensitive Plant Species

Ripley's milkvetch: Two pastures (241 acres) have potential to contain Ripley's milkvetch based on the association with the TEUs (545 and 560). Ripley's milkvetch surveys were initiated within suitable habitat forestwide to include areas within the Jawbone allotment. The results of this survey are not available at this time. Once the extent of the population is known, the timing of livestock use may be adjusted if needed to maintain plant composition and diversity. No surveys specific for robust larkspur have been conducted within the allotment. In the summer of 2007-2008, Ripley's milkvetch was recorded on several sites on the forest during a vegetation mapping project. This did not include sites within the Jawbone allotment (Cortez 2008).

Robust larkspur: Approximately 16,901 acres of upland meadow/grassland qualifies as suitable habitat for robust larkspur. It is found in all of the pastures. No surveys specific for robust larkspur have been conducted within the allotment. The vegetation project (described above) did not record any robust larkspur plants. It is not known whether robust larkspur occurs within the allotment.

Criteria to Measure Effects

To avoid detrimental effects to Ripley's milkvetch and robust larkspur plants, the goal is to manage for the long-term persistence of the plant by following these criterions:

Criterion 1 (Ripley's milkvetch): A rotation-grazing system in which spring grazing occurs only one in three years appears to be compatible with the long-term persistence of *A. scaphoides* populations (Ladyman 2003). Deferring grazing until after seed has set (typically May through June) or even later in the year is also another option. In response to prolonged drought, a rest rotation of more than one in three years may be necessary. Individual plants die back to the ground each year. Therefore, care should be taken to avoid disturbing the soil too deeply to prevent damage to dormant root stock.

Criterion 2: Within suitable robust larkspur habitat maintain 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Criterion 3: To reduce trampling effects to the robust larkspur, use a grazing system that provides partial or complete season rest during the growing season.

The purpose of establishing the criterion is to ensure allowable use of forest sensitive plant species while maintaining or improving the long term persistence of these plants.

Environmental Consequences

Alternative 1

This alternative would eliminate any related risks to the Ripley's milkvetch caused by grazing or trampling by livestock. Trampling and grazing (by sheep) effects to the robust larkspur would be eliminated with this alternative.

Alternative 2 and 3

The implementation these alternatives would increase the probability that Ripley's milkvetch plants may be grazed by livestock and selected over other forage species. However, the ability to adjust permitted numbers and duration (based on production/utilization studies and maintaining 40 percent utilization guidelines throughout the allotments at the end of the growing season) would assure that the species would not be over utilized. Under alternative 2 and 3, grazing by livestock would be managed to allow use while maintaining the plant's ability to continue to grow and reproduce. Criterion 2 would be met for Ripley's milkvetch.

The implementation of alternative 2 and 3 would increase the probability that robust larkspur plants may be trampled by livestock or grazed by sheep. However, as a result of the proposed deferred/rest-rotation grazing system, plant vigor would be improved by providing partial to complete rest. This would reduce trampling and grazing during the growing season. Partial or complete growing season rest would benefit robust larkspur reproduction; seedling establishment, herbage volume; leaf development; seed production; root growth; and food storage. Since the robust larkspur may be poisonous to cattle, it is possible that this plant would not be selected over other forage species. Criterion 3 for the robust larkspur would be met.

All four pastures (three pastures and one area) within the Jawbone grazing allotment would be part of an alternating entry rotation system. Under this alternating entry rotation system, one of the two pastures that have potential to have Ripley's milkvetch would be entered after seed set each year. Entry on the Brokeoff and the Hopewell pasture would never be before June 16th. This would allow Ripley's milkvetch seeds to germinate to seedlings that would eventually grow to fruit/seed producing plants. Ripley's milkvetch plants would perpetuate and lead to the long term persistence of this plant within the allotment. Criterion 1 would be met.

Under alternative 2 and 3, the Brokeoff pasture and the Hopewell pasture could be rested one in three or four years. This selective grazing before seed development may lower the localized population frequency of occurrence; but populations in the Hopewell and Brokeoff pastures would be maintained or improved under these alternatives. The AOI flexibility may also adjust the rotation system where pastures may be grazed more frequently during the latter period of use. Also, the AOI would prescribe a conservative stocking rate for the allotment to prevent management practices that would lower the vigor, growth and survival of the individual plants. Based on the proposed rest rotation system in both alternatives, criterion 1 would be met for Ripley's milkvetch. The implementation of alternative 2 and 3 has potential to impact individual forest sensitive plant species. However, there would not be a measurable negative effect to their populations.

Management Indicator Species (MIS)

The Carson National Forest Plan (USDA 1986) identified 11 wildlife species as MIS to monitor the conditions of the forest's ecosystems. All 11 MIS were considered in the Jawbone allotment

analysis. However, because of limited habitat (vegetation) types found within the analysis area, only three species or groups of species were found to have the potential of being affected by implementation of continued grazing on the allotment. The three species that were evaluated in detail include: elk, resident trout and aquatic macroinvertebrates. Refer to the specialist report in the project record for rationale on why other species were not included in the analysis. [57] For the more detailed Forestwide MIS Assessment (Carson 2007) see project record document [19].

Significant Issues Addressed in the MIS Analysis:

Significant Issue #1: Cool Season Grass Recovery for Mule Deer, Elk and Black Bear. Use an entry date of June 1 for the Ursulo, Chino and Wheatgrass pastures to assure recovery of cool season grasses which are one of the main nutritional needs for mule deer, elk and black bear.

Indicator used to measure effects: The indicator for the impacts to wildlife will be pasture condition and trend in terms of impact to plants during the cool season growth period.

Significant Issue #2: Loss of Quality Cold Water Fisheries. The upper Vallecitos, Tusas Creek and Little Tusas (Rincon Negro) should be monitored for properly functioning condition with regards to riparian zones and livestock. The loss of quality cold water fisheries is the main issue.

Response: Alternative 2 addresses this issue. Impacts to aquatic habitat and fisheries (percent sediment, stream temperature, percent streambank stability) will be analyzed in the fisheries report. Stream habitat surveys will be completed for these 3 perennials streams to gather baseline information.

Rocky Mountain Elk - *Cervus canadensis nelsoni*

There is approximately 18,469 acres of suitable habitat for this species within the Jawbone grazing allotment. During the spring, summer and fall months, elk use the upland meadow/grasslands or forest openings near water sources. There are approximately 7,436 acres of upland meadow within the allotment. During mild winters, elk may stay up at the higher elevations of the allotments utilizing habitats that are used in the fall, summer and spring. During extreme winter conditions elk usually move down to the lower elevations, off the allotment. During the spring, elk will migrate back up to the higher elevations on the district, including the Jawbone allotment. In addition to the resident herd, a migratory herd from Colorado and Game Management Unit (GMU) 4 near the Chama, NM, area, use the allotment as a migratory route to winter grounds.

Criteria to Measure Effects

To meet the needs of elk for their life necessities, the goal is to maintain the following range/forage criteria on the allotment:

Criterion 1: Upland meadow/grasslands

Criterion 1.1: Diversity of grassland plant community equal to 70 percent plant composition in cool season grasses within 5 years.

Criterion 1.2: Within 20 to 40 percent utilization at the end of the summer from wildlife and livestock.

Criterion 2: Vegetation long term trend of good to excellent range conditions in upland meadows and riparian areas.

The purpose of establishing these criteria to ensure allowable use of plant forage species to maintain or improve plant diversity, density, vigor and regeneration over time to support elk to maintain forest-wide population and habitat trends.

Environmental Consequences:

Alternative 1

It is anticipated that there would be an increase in density of the vegetative species such as shrubs, forbs and grasses. Over time, this alternative would increase forage for elk and improve year round habitat. Based on the probability of improving habitat, alternative 1 would maintain the forest trends. In the long term, the existing levels of foraging and grazing by elk would remain static or decrease in accordance with the current long term elk management goals of the New Mexico Department of Game and Fish (NMDGF). However, the long term objectives for elk management may change, as elk/livestock grazing conflicts would diminish under this alternative. Based on the above factors, alternative 1 would continue forestwide population and habitat trends.

Alternative 2 and 3

Under alternative 2 and 3, elk and livestock would compete for the available forage which may lead to elk/livestock grazing conflicts within the Jawbone grazing allotment. These alternatives could especially affect the elk during years of drought, since there would be more competition with livestock for the available forage during these periods. Livestock and elk competition for forage would also continue to occur, since the distribution of forage is wildly limited in forested types. Under alternative 2 and 3, livestock and elk forage competition would occur in upland meadow/grassland while livestock are present on the allotment. The greatest competition would be in the early spring, when cool season grasses are limited.

Range readiness which is used to determine the entry dates on alternating pasture would translate to later entries of livestock onto the upper elevation pastures when it is in rotation for a later entry date. Later entry dates in these pastures would allow a higher percentage of cool season grasses to seed out. Grasses would respond to additional cool growing season rest by increasing root and leaf volume, annual production, seedling establishment, reproduction and vigor. Criterion 1.1 would be met. Overall, this would allow for greater forage diversity in the long and short term for elk.

The proposed grazing system in both alternatives would result in improved livestock utilization and range conditions allotment wide. In the short and long term, as cool season herbage increases due to entry pasture management and pasture get rest (grazing system), livestock would be grazing lightly used areas more often than during previous years, as well as, heavy use areas less often. This would generate a more uniform pattern of use that would make progress towards meeting the utilization objectives. Slight to moderate positive impacts to the utilization level within the key areas would occur because of the flexible management grazing system, growing season rest and season of use. In the long term, conservative livestock grazing of 20 to 40 percent allowable utilization on the allotment would expedite attaining good to excellent range conditions. Criterion 1.4 and Criterion 2 would be met for upland meadows.

The adaptive management actions that would be implemented in the short and long term are expected to improve livestock utilization within riparian and upland areas. In the long term, this would contribute to improved habitat conditions for elk. This would include calving habitat. Criterion 2 would be met. In the long term, this would also contribute to desirable utilization levels and improve diversity of cool season forage to continue to provide favorable foraging conditions for elk. Criterion 1 and Criterion 2 would be met. Based on the above information, alternative 2 would not affect forest-wide population and habitat trends for elk.

Other Big Game Species

- Mule deer - *Odocoileus hemionus hemionus*
- Black Bear - *Ursus americanus*

Within the allotment, there are approximately 7,436 acres of upland meadow/grasslands that may be used for foraging. While mule deer may use the upland meadow grasslands they desire to forage on browse over grass species. Browse is found in the more open forested areas, open ridges, as well as meadows and riparian areas. Black bear make extensive use of riparian zones and small meadow complexes (Hoover and Willis 1987). Cool season grasses are important to black bear as forage during the early spring.

Criteria to Measure Effects:

To accommodate the needs of mule deer and black bear for their life necessities, the Forest Service will attempt to follow the same range/forage criteria listed for elk. See the Criteria to Measure Effects section for elk.

Environmental Consequences

Alternatives 1 through 3 would have similar affects on mule deer and black bear that are described in the environmental consequence section for elk.

Resident Trout

Resident trout species include both Rio Grande cutthroat trout (*Oncorhynchus clarki virginialis*), brown (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). The total number of stream miles suitable for resident trout has not changed since 1986 and has been refined due to better mapping capabilities to contain approximately 444 miles of suitable habitat. The habitat trend for resident trout on the Carson National Forest is currently stable (Carson 2007). Due to the stocking programs on the Carson National Forest, the population trend for resident trout species is stable (Carson 2007).

There are approximately 14 miles of perennial streams on the Jawbone allotment which is 3 percent of the available habitat for resident trout forestwide. The streams included within the allotment are Rio Vallecitos (2.6 miles), Placer Creek (4.0 miles), Rio Tusas (4.5 miles) and Little Tusas Creek (3.0 miles). Please refer to the riparian sensitive species section for habitat conditions.

Alternative 1

The environmental consequences are primarily the same as described for Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker in the riparian sensitive species section.

Forestwide, resident trout habitat trend and population trend would not change, although conditions may improve over the long term, since the streams comprise only 3 percent of the available habitat.

Alternative 2 and 3

The environmental consequences are primarily the same as described for Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker in the riparian sensitive species section. Forestwide, resident trout habitat trend and population trend will not change, although conditions may improve over the long term, since the streams comprise only 3 percent of the available habitat.

Aquatic Macroinvertebrates

Aquatic macroinvertebrates or aquatic insects are indicators for quality perennial stream and associated riparian vegetation. The primary habitat requirement for aquatic macroinvertebrates is perennial water in streams that contain resident trout. Population trends for aquatic macroinvertebrates on the Carson National Forest are healthy and appear to be stable (USDA Forest Service 2007). There are approximately 14 miles of perennial streams on the Jawbone allotment which is 3 percent of the available habitat for resident trout forestwide. The streams included within the allotment are Rio Vallecitos (2.6 miles), Placer Creek (4.0 miles), Rio Tusas (4.5 miles) and Little Tusas Creek (3.0 miles). See the riparian sensitive species section for information on habitat condition.

Alternative 1

The environmental consequences are primarily the same as described for Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker in the riparian sensitive species section. Forestwide, macroinvertebrate habitat trend would not change, although conditions may improve over the long term, since the streams comprise only 3 percent of the available habitat.

Alternative 2 and 3

The environmental consequences are primarily the same as described for Rio Grande cutthroat trout, Rio Grande chub and Rio Grande sucker in the riparian sensitive species section. Forestwide, macroinvertebrate habitat trend will not change, although conditions may improve over the long term, since the streams comprise only 3 percent of the available habitat.

Because of volatile fluctuations that can occur in most aquatic macroinvertebrates populations, trend by number are of little value unless long-term studies show persistent changes. Overall diverse communities of aquatic macroinvertebrates are represented forestwide and are considered stable unless an influence or significant event affects a local or given reach of stream. Population trends for aquatic macroinvertebrates on the Carson National Forest appear to be stable. Neither alternative would change the forestwide macroinvertebrate population trend.

Migratory Birds

Migratory birds have often been referred to as neotropical migratory birds (NTMB). On January 10, 2001, President Clinton issued Executive Order 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds” directing Federal agencies to comply with the order. The focus of the assessment is on habitat and ecosystem processes, not species management.

Partners In Flight (PIF) has identified physiographic areas and high priority species by broad habitat types. The US Fish and Wildlife Service released its Birds of Conservation Concern 2002 report (webpage - <http://migratorybirds.fws.gov/reports/bcc2002.pdf>). The environmental assessment for this project uses information from both the New Mexico PIF website (<http://www.hawksaloft.org/pif.shtml>) and the Birds of Conservation Concern Report for the Southern Rockies/Colorado Plateau Bird Conservation Region (BCR) #16 for the migratory bird analysis. The New Mexico PIF highest priority list of species of concern by vegetation type and the BCR #16 species list will be used to determine which species will be analyzed in this analysis.

The following describe habitats found on the allotment and the migratory birds that are typically found in these habitats. All species described have not been located within the project area, but have the potential of occurring.

Ponderosa Pine Forest

There are approximately 186 acres of ponderosa pine within the Jawbone grazing allotment. Highest priority species include northern goshawk, Mexican spotted owl, flammulated owl, greater pewee, olive warbler, Virginia's warbler and Grace's warbler. The Mexican spotted owl is not found in ponderosa pine habitat on the Carson National Forest. The Greater pewee and the Olive warbler are not found on the Carson National Forest (Carson 2001). Because no alternative would affect the flammulated owl and Grace's warbler, they are not discussed further.

Environmental Consequences

Northern Goshawk – see sensitive species section

Virginia's warbler - Alternative 1 would benefit this species by providing more grass for concealing nest sites. It would be more beneficial for the species. Alternatives 2 and 3 would have a negative affect on nesting habitat by providing less grass for ground nesting sites. This would not have a measurable negative effect to Virginia's warbler populations.

Mixed Conifer Forest

There are approximately 700 acres of mixed-conifer within the allotment. Highest priority species include northern goshawk, Mexican spotted owl, Williamson's sapsucker, olive-sided flycatcher, dusky flycatcher and red-faced warbler. The red-faced warbler is not found on Carson National Forest (Carson 2001). Because no alternative would affect the Williamson's sapsucker, olive-sided flycatcher and dusky flycatcher, they are not discussed further.

Spruce-Fir (Subalpine)

There are approximately 1,340 acres of spruce-fir within the allotment. Highest priority species include blue grouse and boreal owl (Carson 2001).

Boreal Owl - See sensitive species section

Blue Grouse - Alternative 1 would benefit this species by providing more grass for concealing ground nest sites and would not affect grouse by trampling. It would be more beneficial for the species. Alternatives 2 and 3 would have a negative affect upon nesting habitat. There is the potential of livestock trampling nest and killing young. This would not have a measurable negative effect to the grouse population.

Wet Meadow (High Elevation Grassland)

There are approximately 7,436 acres of high-elevation grasslands within the allotment. Highest priority species include the Wilson’s phalarope and bobolink (Carson 2001). To date, no breeding bird surveys have been conducted in the wet meadow habitat within the west one districts that include the Canjilon, Tres Piedras and El Rito Ranger District.

Environmental Consequences

Wilson’s Phalarope - Alternative 1 would benefit the species by decreasing the risk of livestock trampling ground nests in wet meadows. Alternatives 2 and 3 would affect the species during nesting season when livestock is utilizing the wet meadow habitat. This would not have a measurable negative effect to Wilson’s phalarope populations.

Bobolink - Alternative 1 would benefit the bobolink by decreasing the risk of livestock interrupting the breeding success for the species. Alternatives 2 and 3 would affect the species during breeding season when livestock is utilizing the wet meadow habitat. This would not have a measurable negative effect to Bobolink populations.

High Elevation Riparian Woodland

Riparian habitat corresponds with Terrestrial Ecosystem Unit (TEU) 66, (TEU) 67 and (TEU) 68 (USDA, 1987). Approximately 1,349 acres of riparian habitat base on TEU is found on the allotment. Highest priority species include the black swift, red-naped sapsucker, Hammond’s flycatcher, American dipper, veery, painted redstart and McGillivray’s warbler. Because the painted redstart and black swift does not occur on the Carson National Forest (Carson 2001), they are not discussed further. Because no alternative would affect the red-naped sapsucker and Hammond’s flycatcher, they are not discussed further.

Environmental Consequences

American Dipper – Alternative 1 would benefit the American Dipper by decreasing the risk of livestock grazing attributing to stream erosion. The implementation of alternatives 2 and 3 may attribute to erosion in Rio Vallecitos, Rio Tusas, Little Tusas and Placer Creek. This would contribute to siltation that affects aquatic invertebrate prey. However, it would be anticipated that these alternatives would not have a measurable negative effect to American dipper populations.

Veery - Alternative 1 would benefit the veery by decreasing the risk of livestock impacting alder, willow and shrub cover along streams. The implementation of alternatives 2 and 3 could impact this species by reducing the amount of willows and shrubs along the riparian. However, it would be anticipated that these alternatives would not have a measurable negative effects to veery populations.

MacGilliv-ray’s Warbler - Alternative 1 would benefit this species by providing grassier component for concealing nest sites along creeks. The implementation of alternatives 2 and 3 could impact species by reducing the grass component near creeks that is used for nesting. However, it would be anticipated that these alternatives would not have a measurable negative effect to MacGilliv-ray’s warbler populations.

Summary of Effects – All Species

The implementation of any of the alternatives, would not significantly impact or impair wildlife resources or values that are necessary to fulfill the specific purposes identified in the Purpose and Need for the Jawbone allotment analysis. As a result of this effects analysis, it is determined that management activities associated with livestock grazing may affect wildlife species by affecting prey base habitat, cover, nesting habitat and/or competing with other wildlife species for available forage and water. The implementation of the alternatives within the allotment would not cause population changes of TE&P, forest sensitive species, management indicator species, migratory birds and other wildlife.

Wildlife - Cumulative Effects (fish and macroinvertebrates not included)

Some animals are much more mobile than others. Therefore, it is important to recognize the entire range of an animal's habitat as its affected environment, instead of just the pastures of the Jawbone allotment. For example, the Gunnison's prairie dog does not move around much—staying in the upland meadows and hibernating, instead of migrating for the winter. Therefore, its affected environment is the upland meadows habitat type within the allotment. On the other hand, elk use much larger areas to mate, calve, graze and winter. Therefore, its affected environment also includes habitat outside of the allotment. This analysis discusses the past, present and reasonably foreseeable future activities combined with the effects of the alternatives of this grazing analysis. These activities were analyzed when determining cumulative effects for each species

The past, present and reasonably foreseeable future activities were analyzed when determining cumulative effects on species discussed in this analysis. These include trespass livestock grazing, fire use, the Maquinita Ecosystem Restoration Project and range improvement projects that include pasture/allotment fence construction. These projects have incrementally contributed to, are contributing to, or will contribute to the current condition of the area.

The upland meadows and riparian habitats have been affected by historical and on-going grazing activities on federal lands and private lands. This area has historically been grazed for several hundred years. Heavy grazing in the past (before grazing was managed by the Forest Service) has caused a change in plant species composition and reduced the amount of riparian habitat available. Historical grazing had a negative effect on the Mexican spotted owl, boreal owl, northern goshawk, American marten, ermine, mink and some migratory bird species due to the loss of prey species. This occurred by changing timber stand structures and removing fine fuels for natural wildfires.

These affects have been improving since the Forest Service began the administration of this grazing allotment. Current on-going grazing on the allotment has shown that the grazing activities (overall) are maintaining range conditions in the upland meadows and riparian areas. These improvements are beneficial to prey species for the Mexican spotted owl, northern goshawk, boreal owl, American marten, ermine, mink and some migratory birds. This is due to more grass and shrub species and more forage being available for the white-tailed jackrabbit, Gunnison's prairie dog, western heather vole, elk and other big game species. However, due to changes in plant species composition, there is still a negative affect to these species. Changes in the riparian habitat affected the northern leopard frog, Nokomis fritillary, cinereus shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species. As the habitat has recovered it has improved the habitat for these species.

The cinereus shrew, dwarf shrew, water shrew, western heather vole and long-tailed vole are negatively affected due to changes in plant composition, especially those required for dense and diverse cover. Plant species such as Ripley's milkvetch and robust larkspur are negatively affected due to on-going grazing by these plants being grazed, trampled or by changing their habitat.

Historical grazing, on-going grazing, roads, and recreation activities have potentially increased sediment which has affected water quality on the streams within the allotment. The increase in sediments could have negatively affected the northern leopard frog, water shrew, spotted bat, pale Townsend's big-eared bat and mink. Excessive sediments, if not flushed through the stream, system will degrade these species habitat and their prey base species (macroinvertebrate, insects, and fish) habitat. These impacts, if not managed, may magnify minor impacts to riparian areas that may be caused by livestock grazing.

These affects have been improving since the Forest Service began administering this grazing allotment. Current on-going grazing on the allotment has shown that the grazing activities (overall) are maintaining range conditions in the upland meadows and riparian areas on the Brokeoff pasture (see table 5). These improvements are beneficial to prey species for the Mexican spotted owl due to more grass and shrub species being available. However, due to changes in plant species composition, there is still a negative affect to the species.

Future activities such as the Maquinita Ecosystem Restoration Project will reduce fuel loading in the area. However, there is still a chance that the area could experience a stand replacement wildfire. Prescribed burning and fire use would provide benefits to elk, white-tailed jackrabbit, Gunnison's prairie dog, burrowing owl, western heather vole and other big game such as mule deer and black bear (by providing foraging habitat for them). However, if the fire is too large, the benefit will be reduced due to the loss of available cover.

Alternative 1

Alternative 1 would incrementally reduce the cumulative impacts on the Mexican spotted owl, northern goshawk, boreal owl, ermine, American marten, mink and some high priority migratory bird species by providing for more cover for prey species. Grass and shrub species in the upland meadow/grasslands, riparian areas, and in timbered stands that are treated by past, present and foreseeable activities, would result in greater diversity of herbaceous cover. Incrementally, riparian habitat would likely improve at a quicker rate without livestock grazing within the wet meadows and riparian vegetation due to increase in plant diversity and density. Also, by reducing the amount of sediments introduced into the drainages. This would benefit northern leopard frog, Nokomis fritillary, cinereus (masked) shrew, dwarf shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species. By removing livestock, this alternative would eliminate competition between white-tailed jackrabbit, Gunnison's prairie dog, elk, mule deer and black bear. Without livestock in the allotment, more forage for elk, mule deer and black bear would be available. Alternative 1 would also reduce cumulative direct impacts to Gunnison's prairie dogs and plants such as the Ripley's milkvetch and robust larkspur. With this alternative, there would be less trampling impacts to these species and less chance of livestock foraging these plants or altering the plants habitat.

Alternatives 2 and 3

The livestock grazing in alternatives 2 and 3, when cumulatively added to past, present and foreseeable activities, would not incrementally reduce the availability of structural habitat such as trees and snags. This habitat is used by Mexican spotted owls, northern goshawks, boreal owls, martens, spotted bats and pale Townsend's big-eared bats for roosting/resting and nesting/denning sites. However, the proposed livestock grazing, when added to the past, present and foreseeable livestock grazing on other allotments, grazing on private lands, and livestock trailing could incrementally affect the woody vegetation structure in suitable riparian habitats (when livestock overuse the herbaceous vegetation and begin to utilize the woody species).

Alternatives 2 and 3 cumulatively with past, present and reasonably foreseeable actions such as livestock grazing on adjacent allotments that include livestock trailing through the Jawbone allotment could incrementally impact Mexican spotted owl, northern goshawk, boreal owl, ermine, American marten and mink and some migratory birds prey base species diversity and abundance by reducing herbaceous ground cover. The riparian species to include the, northern leopard frog, Nokomis fritillary, cinereus shrew, dwarf shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species would also be affected.

Livestock grazing on adjacent allotments that includes trailing through the allotment combined with the proposed grazing could incrementally impact Ripley's milkvetch by utilizing the plant early in the spring-summer before seed set. Trampling and grazing (by sheep) impacts to the robust larkspur could also be increased.

The proposed grazing system in both alternatives (managed through the AOI) allows alternative entry pastures, pasture rest, and later entry dates onto the upper elevation pastures. This would allow time for Ripley's milkvetch to seed and would reduce trampling and grazing effects by sheep. This would allow the persistence of robust larkspur plants.

The proposed livestock grazing in alternatives 2 and 3, along with the present existence of forest roads and the recreation that occurs adjacent to these roads, could incrementally contribute to poor riparian and watershed conditions. Poor riparian and watershed conditions can result from these activities by increasing runoff to contribute to increased silt loads. This can result in increased turbidity, decreased water quality, increased scouring during high flows and altered pH levels. All of these impacts can have an indirect adverse effect to riparian species such as northern leopard frog, Nokomis fritillary, cinereus shrew, dwarf shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species

Past, present and reasonably foreseeable actions such as maintaining existing range improvements have improved livestock distribution within the allotment. This has improved prey base habitat on the allotment for the Mexican spotted owl, northern goshawk, boreal owl, ermine, American marten and mink and some migratory birds by improving/decreasing the utilization of forage. The improvement in livestock distribution and improved utilization has also improved watershed conditions by facilitating the restoration of riparian habitat. This would improve livestock distribution and help maintain conservative forage utilization by all ungulates within these pastures on the allotment. This would assist in rehabilitating the uplands and watersheds that would facilitate the restoration of riparian habitat for, northern leopard frog, Nokomis fritillary,

cinereous shrew, dwarf shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species.

Foreseeable actions adjacent to the allotment include fire use within the allotment and prescribed burning/timber harvest in the Maquinita ecosystem restoration analysis area. When combined with the proposed conservative forage use by livestock, this would improve range conditions by providing more forage in the upland meadows and riparian areas. The increase in forage would improve habitat for Mexican spotted owl, northern goshawk, boreal owl, ermine, American marten and mink (and some migratory birds prey base in the short term and long term). An improvement of forage would also benefit elk, white-tailed jackrabbit, western heather vole, Gunnison's prairie dog and other big game such as mule deer and black bear. Improving range conditions in the upland meadows and riparian areas would contribute to improving the watershed and riparian conditions for the northern leopard frog, Nokomis fritillary, cinereous shrew, dwarf shrew, water shrew, spotted bat, pale Townsend's big-eared bat, long-tailed vole, ermine, mink and riparian dependent migratory bird species riparian habitat.

The proposed conservative grazing when combined with a fire use program and prescribed burning would improve condition for forest sensitive plants such as Ripley's milkvetch and robust larkspur. The past, present and foreseeable actions, when combine with the proposed adaptive management actions to be implemented as part of Alternatives 2 and 3, would incrementally improve range conditions in riparian areas and upland meadows. Therefore, those species dependent on these habitats would benefit from these actions.

Cumulative Effects - Rio Grande cutthroat, Rio Grande chub, Rio Grande sucker, Resident Trout and Aquatic Macroinvertebrates

Effects of Past and Present Activities

Based on a stream inventory report (2002) and field observations, a 0.25 mile portion of Placer Creek within the Hopewell Recreation Area exceeds criterion for sediment and streambank stability. Temperature is likely excessive. This results from streambank trampling and a lack of riparian vegetation from livestock impacts. A foreseeable action is the completion of a fence (0.5 mile) which would exclude livestock from this 0.25 mile of Placer Creek. This would result in improvements to the stream habitat condition by eliminating trampling of streambanks and increasing riparian vegetation.

Approximately 1.5 miles of Placer Creek, below Hopewell Lake exceeds criterion for sediment. Sources of sediment are primarily attributed to activities associated with recreational mining on private lands within Placer Creek (1.5 miles). Periodic low water flows due to climatic conditions also maintain sediments within the stream (since flows are not always sufficient to move or flush sediments through the stream). In years of normal or high flows, sediment is transported through the stream. Hopewell Lake functions to trap sediments that are transported from upstream (2.5 miles). This reduces sediment that would be contributed to the reaches below the lake.

The Rio Vallecitos, Rio Tusas and Little Tusas do not have stream inventory reports. It is likely, based on field observations, riparian assessments and range specialist reports, that these streams are meeting the criterion for sediment, streambank stability and temperature. Road crossings in the Rio Vallecitos likely contribute some sediment to the stream from livestock trailing and vehicular use.

Alternative 1

Since there would be no direct or indirect effects to fisheries as a result of no grazing, there would be no cumulative impacts along Placer Creek, Rio Vallecitos, Rio Tusas and the Little Tusas. Other factors noted above would continue to impact stream habitat condition.

Alternatives 2 and 3

In these alternatives, authorized grazing would continue. On an annual basis, livestock numbers may be adjusted to respond to resource conditions. Management actions such as moving livestock out of riparian areas, reducing livestock numbers, salting away from waters would result in maintaining or likely improving stream habitat conditions, if successfully implemented. It is anticipated that the Brokeoff and Hopewell pastures would remain in fair to good condition.

In these alternatives, stream habitat conditions would be expected to improve to some degree in the Rio Vallecitos, Rio Tusas and Little Tusas. The effects of these alternatives on Placer Creek (reach 1, 2 and 3), below Hopewell Lake, along with the effects of past present and reasonably foreseeable activities would have minimal improvements to stream habitat condition because of the other factors not related to grazing on the allotment or National forest lands (see above). A foreseeable action is the completion of a fence (0.5 mile) which would exclude livestock from 0.25 mile of Placer Creek (reach 6) within the Hopewell Recreation Area. This would result in improvements to the stream habitat condition by eliminating trampling of streambanks and increasing riparian vegetation.

Heritage Resources [41]

This effects analysis identifies the known heritage resources within the allotment and analyzes effects of the alternatives on heritage resources in accordance with the USFS Region 3 “Standard Consultation Protocol for Rangeland Management: First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities” (USFS 2005).

Approximately 15,000 acres, or 11 percent of the entire project area (please note, the project area included 3 additional allotments – Tio Grande, Tusas and San Antone) has been inventoried for heritage resources and a total of 237 archaeological sites are on record. Two other heritage site types considered for effects are Traditional Cultural Properties (TCPs) and sites listed on the National Register of Historic Places. Neither of these site types is present within the project area.

Potential Effects to Historic Properties

Settings where cattle congregate consist of corrals, around earth tanks and drinkers, in stream bottoms and sometimes along fences, particularly in corners and at gates. Many of the corral locations in the allotments were inventoried prior to construction or prior to expansion. As a result heritage sites were identified, where present, and avoided.

A number of stock drinking water sources were visited as a part of this analysis or for projects occurring in the allotments over the past 6 years, including, for example, the earth tanks in the Gavilan area, the La Manga pasture and at Hopewell Lake. The features have been in place for varying lengths of time, some for nearly a century. Generally speaking, there appears to be one or two earth dams constructed within an allotment every decade or so. Most of these locations have

well-worn cattle trails that fan out from the drinking features into the surrounding pastures. None of the trails have been identified as cutting through significant buried deposits.

Salt blocks are used to move livestock around in the pastures, attracting them to the more lightly-used upland areas and out of the stream bottoms. With the abandonment of this practice (permanent salting locations), salting appears to have a minimal effect on the environment.

Tribal Consultation

A consultation letter was sent in January of 2007, listing all the proposed projects for each Ranger District with an enclosed project location map. The project was added to the SOPA calendar in 2006 and has remained on the calendar through the present. The SOPA calendar and a consultation letter are sent to the tribes on a quarterly basis. The tribes receiving the letter and SOPA calendar include: The Comanche Tribe of Oklahoma, The Jicarilla Apache Nation, The Navajo Nation, The Southern Ute Indian Tribe, The Ute Mountain Ute Tribe, The Hopi Tribe, and the Pueblos of Jemez, Nambe, Ohkay Owingeh, Picuris, Pojoaque, San Ildefonso, Santa Clara, Taos, Tesuque and Zuni. An additional mailing providing the tribal governments with opportunity for comment was sent out July 9, 2008. The tribal governments have not identified any specific traditional or sacred places within the project area or other concerns regarding this project.

Environmental Consequences- All Alternatives

Under alternative 1, grazing would not be allowed on the allotment. As erosion or other natural deterioration (not related to livestock grazing) of the landscape is not occurring, or is very limited and localized, there would have no effect (direct, indirect, cumulative) on heritage resources. Heritage resources would remain in their current condition.

Livestock grazing has been taking place on the allotments for over a century. Large-scale projects of any kind in the project area, other than timber harvest, were no longer being proposed by the 1970s (following passage of the National Environmental Policy Act and the National Historic Preservation Act). Since that time, the effects of grazing in the project area, such as erosion, trampling / compaction, and overgrazing of palatable plant species are believed to have moderated, and are expected to continue to do so under the proposed action. No adverse effect is expected from implementation of the proposed action. There would be no effect to Traditional Cultural Properties (TCPs) and sites listed on the National Register of Historic Places. Neither of these site types is present within the project area.

Wilderness, Wild and Scenic Rivers, and Special Designations [53, 54]

Jawbone allotment livestock do not graze within the wilderness. The allotment is approximately 6 (air) miles from the Cruces Basin Wilderness. In addition, there are no wilderness study areas within the allotment. No alternative would have direct, indirect or cumulative effects to wilderness character, i.e. any change to the following indicators of wilderness character: (1) untrammeled, (2) natural, (3) undeveloped and, (4) outstanding opportunities for solitude and unconfined recreation.

Wild and Scenic Rivers

There are no designated Wild and Scenic Rivers within or adjacent to the Jawbone allotment. The allotment is at least 25 miles away from the closest designation, the Rio Grande. Therefore, this is not discussed further.

There are three eligible Wild and Scenic River segments that occur on the allotment. The first segment of the Rio Tusas is located within the Brokeoff pasture (from the headwaters to private lands). The segment is 4 to 5 miles in length and has the outstanding remarkable value (ORV) of “wild” for fish – Grade “A” Rio Grande cutthroat trout population values (Carson 2001).

The 1st segment of the Rio Vallecitos (that is within the Hopewell pasture) is seven to eight miles in length (from the headwaters to the forest boundary). This segment meets “scenic,” “geologic” (rock cliff formations) and “historic” (mining evidence) ORV criteria. The headwaters and most of its length (slightly over 50 percent) are on private lands. Rio Vallecitos tributaries (Placer Creek) from Hopewell Lake (approximately 2 to 3 miles) to the forest boundary are also eligible for the same ORVs as noted above.

All alternatives should benefit the “wild” ORV in the Rio Tusas because it is likely that with no livestock grazing, fish habitat conditions would improve over the existing level and site specific areas impacted would heal. Alternatives 2 and 3 would maintain and/or improve the ORV because improved habitat conditions for Rio Grande cutthroat trout are expected to improve (see Forest sensitive species section).

No alternative would affect the “geologic” or “historic” ORVs (see heritage report) in both Rio Vallecitos segments. All alternatives may benefit the “scenic” ORV because improved stream habitat conditions (which include improved stream bank stability, i.e. less visible impacts from livestock) are expected. Intensive management that results in less livestock concentration, particularly along riparian areas and upland meadows (wildlife can be viewed from the river corridor) would at least maintain the current quality of habitat. There is nothing proposed in Alternatives 2 and 3, which includes the continuation of grazing and intensive management, that would alter this value (which is mostly dependent on landscape features). However, because slightly over 50 percent of this segment is within private lands, it is unknown how uses on private lands may affect the “scenic” ORV in the future.

Other Special Designations

There are no designated or proposed Research Natural Areas within the allotment (Forest Plan, MA 19). Therefore, this is not further discussed. There are no inventoried roadless areas (IRA) within the allotment. The closest IRA is adjacent to the San Antonio allotment near the Cruces Basin Wilderness (see map in project record). There are no activities proposed within the allotment that would directly, indirectly or cumulatively affect the IRA. Inventoried roadless areas are not discussed further.

Social and Economic Environment [55]

Significant issues addressed in this analysis:

Significant Issue #6: Social and Economic Impacts: The proposed changes will not only have a negative economic impact but it will also affect the quality of life for those that depend on

grazing rights for human survival. It will affect a historic and culturally sensitive practice that has been passed down for generations.

Indicator used to measure effects: The indicator is a qualitative discussion on impacts to quality of life, tradition and culture. The economic indicator will be the potential change in gross revenues as a result of annual reductions (based on actual use).

This analysis focused on the location of the allotment in relation to the community of Tres Piedras, New Mexico (Taos County), to communities relatively close to Tres Piedras (including El Rito and La Madera) and to the 2 southern Colorado communities of Sanford and Manassa.

In the 1800's, the land that now encompasses the Jawbone allotment was once the second in the world in sheep production. Conversion (from sheep to cattle) on the allotment started in 1960. By the mid 1970's, range management objectives for the allotment became focused on converting the class of livestock from sheep to cattle to match the high bunchgrass composition (estimated at 75%) found on the allotment (Rangeland Vegetation Specialist Report 2008). In the past 10 years, one permittee was given temporary approval to convert from sheep to cattle. Currently, two of the five permit holders have sheep permits. One permittee recently (2008) requested a permit conversion from sheep to cattle. This may be due, in part, to the cost of sheep operations. Sheep operations are known to be more costly than cattle operations as they require a herder to be constantly present (Personal communication with Dominguez 2008) (Manzanares 2000).

When not on the Jawbone allotment, the permittees have a high degree of management flexibility. They base their operations on their private lands and some may lease other lands. One family has a permit on adjacent Bureau of Land Management allotments and all permittees have permits on other Tres Piedras allotments such as TCLP, Tio Gordito, Servilleta, and Tres Orejas (see rangeland vegetation specialist report, #51). Some permittees also use the grazing allotments on the El Rito Ranger District and on the Conejos Peak Ranger District on the Rio Grande National Forest. In northern New Mexico, contemporary ranching operations that have access to private grant lands use a combination of privately owned or leased lands, grand lands and public lands as their range. As private land sales occur, grazing areas become limited to many ranchers. More reliance is placed on forest grazing permits (Raish and McSweeney 2003).

From 2002 to 2006, permittees voluntarily adjusted animal numbers in response to resource conditions (drought and drought recovery periods). There was a 17% average reduction in cattle and a 46% average reduction in sheep during this time. A rangeland management objective of providing reliable forage was not attainable for full livestock numbers during this time. No Jawbone allotment permittee went out of business during this period while a total of four permittees went out of business in 2003 and 2004 on the neighboring allotments of Tio Grande and San Antone (Personal communication with Yonemoto 2008). The Jawbone permittees reduce herd size numbers in order to stay in business (Personal communication with Dominguez 2008) and had operational flexibility in terms of having several options for holding and feeding their cattle and/or sheep.

Environmental Consequences (Social and Economic)

Alternative 1

This alternative would not support the purpose and need which includes: (1) contributing to the local economy and the stability of northern New Mexico communities and (2) providing forage for livestock in order to contribute to the economic diversity and social well being of surrounding communities that depend on range resources for their livelihood.

While the ranching lifestyle for eight families may be continued through private land, BLM operations, and other forest allotment use, there would be an adverse effect to these families in terms of losing the connection to this land base that has been place for several generations. The Jawbone allotment serves to increase operational flexibility and contributes to both lifestyle and gross revenue. Without the use of the high elevation allotment, life-style changes could include decreasing their spending, diversifying operations to make them less dependent upon ranching and family members seeking more "outside" work to bring in more income (Aragon 2007).

Losses in estimated income would be greatest in this alternative. Based on a stocking rate of 330 cow/calf for 107 days, 720 ewe/lamb for 92 days, and 556 ewe/lamb for 77 days, the permittees would lose approximately \$55,000 in estimated gross income³. Indirect effects (and income losses) that may occur, but are not quantified, are the effects to the use of the lower elevation BLM and other forest allotments when this high elevation vegetation is not available.

Whether permittees could continue livestock operations without the use of this allotment would depend on how well they could adjust their operations. The permittees may need to find other sources of grazing land (that is comparable to this high elevation allotment), reduce herd size or provide for supplemental feeding. Lands that are available for leasing may be readily available in both southern Colorado and around Tres Piedras, New Mexico. However, supplemental feeding and/or the acquisition of other grazing lands may be impractical and exceed any profit margin.

Alternatives 2 and 3

In alternative 2 and 3, there would be no change in terms of lifestyle choice and the continuance of tradition. There would be no change in the stocking rate or the season of use. The estimated gross income from cattle and sheep operations (with no conversions) is approximately \$55,000. During years of favorable resource conditions and weather, permittees are likely to maximize revenue generation.

Likewise, based on the past voluntary stocking rate reductions, there may be years when revenue generation is reduced by as much as \$6,600 for cattle and \$7,500 for the 2 sheep operations (combined) due to poor forage production and low precipitation (see cow/calf and ewe/lamb income sheet in the specialist report for additional information on calculations). [55] This assumes that through adaptive management and the AOI, the quality and quantify of forage is at least maintained during years of poor precipitation and improved and increased during "good" years.

³ For the permittee with 556 ewe/lambs, the loss is estimated to be \$6,685. For the permittee with 720 ewe/lambs, the loss is estimated to be \$9,840. For the cattle permittees, the loss is estimated to be \$38,791.

Based on how the permittees have responded in the past to drought and drought recovery periods, it is likely the permittees would stay viable since they currently have operational flexibility (see discussion above). The permittees have demonstrated they can modify management and recover from poor revenue periods. Alternative 3 further provides for meeting permittee business needs by allowing for conversions. The conversion from sheep to cattle could reduce management costs and potentially increase gross revenue. The change in gross revenues is unknown until the final requests for conversion are proposed or accepted.

Please note, costs that are not included in this analysis are the other costs that permittees have in order to sustain livestock operations. Costs would include maintenance of fences, cattle guards, gates and stock tanks; hauling water where it is inadequate, hiring of the sheep herder, and grazing fees. Time and monies spent commuting would also be part of the costs. In addition, the recent but significant rise in fuel and transportation-related costs adds additional burden. These costs would be offset by the income generated from the grazing operations. In general, many permittees do not maintain their grazing operations as commercial ventures so much as for a lifestyle choice and to maintain cultural traditions.

Cumulative Effects

Because the total number of permitted livestock (cattle and sheep) on National Forests in the Southwestern Region (Arizona and New Mexico) has dropped dramatically during the past century (from over 1,400,000 permitted head in 1909 to approximately 200,000 by 1997) (Aragon 2007) eliminating grazing on the allotment may contribute to the overall trend of fewer small livestock operations. The small communities in southern Colorado (Manassa and Sanford), may be most influenced by the mid-sized, but growing, community of Alamosa. The reduced number of livestock operations, combined with the emerging growth in population in proximity to the permittees communities, could contribute to a loss of traditional land uses and values. Land that was once available for agriculture may be converted to residential use which does not accommodate livestock grazing. For the northern New Mexico communities of Tres Piedras, El Rito and La Madera, based on observing how growth has affected other communities in near proximity to these communities (such as Espanola and Taos), the assumption is that lands that were once considered agricultural lands are likely to be sold and converted to residential development. Over time as more permittees get out of the livestock business, those people who had connections to the national forest may be reduced.

In alternative 2 and 3, there would be no cumulative effects in terms of maintaining lifestyle choices and tradition through use of the national forest. Should there be extended periods of poor forage conditions, permittees may have to make operational adjustments to stay in business. The cumulative effect would be the same as described in alternative 1 with one exception. In the early 1900's the private lands in close proximity to the allotment (Tierra Amarilla and Chama, New Mexico), used to primarily run sheep operations. Since that time, there has been a steady decline in sheep operations due to ranchers converting to cattle operations or getting out of the ranching business entirely (Manzanares 2000). Allowing for the conversion from sheep operations to cattle operations in alternative 3 would contribute to the current trend which is less sheep operations.

Environmental Justice [55]

As required by law and Executive Order 12898 (1994), all Federal actions should consider potentially disproportionate effects on minority or low-income communities. Potential impact or

change to low-income or minority communities within the study area due to the proposed action should be considered. Where possible, measures should be taken to avoid negative impacts to these communities or mitigate the adverse effects.

The rural community of Tres Piedras is located east of the allotment and numerous small, predominantly Spanish communities are located within the study area (see discussion above on communities considered). Native Americans have been present in the area for over 1,000 years and Spanish settlers arrived in the area around 1540 (Kyte 2008). Please see the heritage resources report for detailed information on the cultural history that is associated with the allotment. [38]

The permittees are from small northern New Mexico communities that include Tres Piedras, El Rito, and La Madera. Two permittees come from small southern Colorado (Manassa and Sanford) communities. While Tres Piedras is the nearest community to the allotment, impacts to this community would be extremely limited given that small businesses that offered fuel and restaurant services are no longer open (as of June, 2008). The disposable income of the New Mexico permittees is likely to be used in El Rito and Espanola, New Mexico. In Colorado, economic impacts are more likely to be realized in the vicinity of the permittee homes, particularly Alamosa, Colorado.

All the communities in the study area would fall under the minority and/or low-income populations identified in the Environmental Justice Executive Order 12898. Generally, environmental justice is concerned with identifying these communities and ensuring that they are involved in and understand the potential effects of the proposed action. The people in the study area communities are interested in maintaining their historic and subsistence lifestyle and in using the surrounding area to gather resources as needed (see chapter 2, public involvement section).

Environmental Consequences

Alternative 1

This alternative would negatively affect the lifestyle of the communities in the study area. This alternative would impact some individuals that are part of the minority and low-income populations. Eliminating the opportunity to graze cattle and sheep would adversely affect the permittees and their families by changing traditional use of the land. It may cause an economic hardship to those individuals who rely, in part, on the income generated from their long-term cattle and sheep operations. Although most of the permittees have private lands or other allotment use, the loss of the high elevation allotment may disrupt or discontinue some of this ancillary use. The cumulative impacts are the same as discussed in social and economics for alternative 1.

Alternatives 2 and 3

Overall, alternative 2 and 3 should result in no change on low income or minority populations. There may be years when permittee revenues may be lower because of weather and resource conditions. However, forage availability (which translates into potential revenue) should be maintained or improved in the long term (see chapter 3, rangeland vegetation effects). Because any sheep to cattle or cattle to sheep conversions would be at the request of the permittee (not required by the Forest Service), there would be no change to the traditional use of the land and no change (that is not anticipated by the permittee) in economics related to the grazing authorization. There would be no displacement of minorities, changes of land use or increases in taxes that

would constitute an economic hardship. During consultation, the tribal governments have not identified any specific traditional or sacred places within the project area or other concerns regarding this project. There would be no cumulative impacts.

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Chapter 4 – Consultation and Coordination

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

Federal and State Agencies

New Mexico State Historical Preservation Office (NM SHPO)
State of New Mexico Department of Game and Fish
State of New Mexico Environment Department
US Department of the Interior, Fish and Wildlife Service
US Department of the Interior, Bureau of Land Management

Local Government

Rio Arriba County
Rio Arriba County Cooperative Extension Service

Tribes

Pueblo of Jemez	Pueblo of Taos
Jicarilla Apache Nation	Pueblo of Tesuque
Pueblo of Nambe	Pueblo of Zuni
Pueblo of Picuris	The Hopi Tribe
Pueblo of Pojoaque	The Navajo Nation
Pueblo of San Ildefonso	Southern Ute Tribe
Pueblo of Okay Owingeh	Ute Mountain Ute Tribe
Pueblo of Santa Clara	Comanche Tribe of Oklahoma

Organizations

WildEarth Guardians	Northern NM Stockman's Association
Wild Watershed	Carson Forest Watch
Western Watershed	New Mexico Trout
Sierra Club Rio Grande Chapter	NMSU Cooperative Extension Service
Western Watershed	San Antone Livestock Association
Forest Trust	Tio Grande Livestock Association
Center for Biological Diversity	

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Chapter 6 – List of Preparers

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Appendix A – Project Record Index

DOC #	DATE	DOCUMENT	AUTHOR	RECIPIENT
1	03.06.72	Region 3 Policy on Managing National Forest Land in Northern New Mexico	USDA Forest Service, Southwestern Region, Regional Forester	Project Record
2	1973-2000	Permit Maps	Tres Piedras Ranger District	Project Record
3	09.86	Environmental Impact Statement, Carson National Forest Plan	Carson National Forest	Project Record
4	10.31.86	Record of Decision Carson National Forest Land and Resource Management Plan	Carson National Forest	Project Record
5	10.31.86	Carson National Forest Plan, as amended	Carson National Forest	Project Record
6	08.00.87	Terrestrial Ecosystems Survey of the Carson National Forest	USDA Forest Service, Southwest Region	Project Record
7	04.88	Range Analysis and Management Handbook, re: vegetation condition classes	USDA Forest Service, Southwestern Region	Project Record
8	12.03.90	FSH 2509.22 Soil and Water Conservation Practices Handbook	USDA Forest Service, Southwest Region	Project Record
9	07.27.95	Rescission Act of 1995, PL 104-19, Section 504		Project Record
10	1999	Utilization Studies and Residual Measurements	USDI Bureau of Land Management, et. al.	Project Record
11	06.08.04	Jawbone Term Grazing Permit - Bagwell	Tres Piedras Ranger District Range Staff	Project Record
12	01.14.05 – 07.01.08	Schedule of Proposed Actions	Carson National Forest	Project Record
13	09.09.05	FSM 2238 Grazing Fees	USDA Forest Service	Project Record
14	03.24.06	Jawbone Term Grazing Permit – Vigil	Tres Piedras Ranger District Ranger	Project Record
15	03.02.07	2007 Jawbone Allotment Annual Operation Instructions	Benjamin Romero, Tres Piedras District Ranger	Project Record

DOC #	DATE	DOCUMENT	AUTHOR	RECIPIENT
16	03.19.07	Project Initiation Letter	Benjamin Romero, Tres Piedras District Ranger	IDT
17	04.19.07	Jawbone Term Grazing Permit – Crowther	Benjamin Romero, Tres Piedras District Ranger	Project Record
18	05.30.07	Allotment analysis timeline	IDT	Project Record
19	06.07	Management Indicator Assessment	Carson National Forest	Project Record
20	07.20.07	Jawbone Allotment Existing Condition with GIS maps	Anna Dominguez	Project Record
21	09.08.07	FSH 2209.13 Grazing Permit Administration Handbook, Chapter 90	USDA Forest Service, Southwestern Region	Project Record
22	10.15.07 to 10.18.07	IDT Meeting Notes - Purpose and Need, Proposed Action, Data Needs	Cote, IDT Lead	Project Record
23	10.30.07	IDT Meeting Notes – Purpose and Need, Proposed Action, Data Needs	Cote, IDT Lead	Project Record
24	12.13.07	IDT Notes – re: PN/PA	Cote, IDT Lead	Project Record
25	01.21.08	E-mail for project record re: forest plan consistency for recreation sites	Cote, IDT Lead	Project Record
26	03.08	Recommendations for allotment management	Arturo Valdez	Tres Piedras District Ranger
27	03.20.08	Letter re: Updating Livestock Weights, Forage Consumption and Stocking Rates	John Marvel with Western Watersheds Project, Inc.	Corbin Newman, Regional Forester
28	03.28.08	Recommendation for allotment management	Arturo Valdez	Project Record
29	05.21.08	Scoping letter with mailing list	Tres Piedras District Ranger	Interested parties
30	05.23.08	Returned scoping letters – undeliverable	Various	Project Record
31	06.06.08	IDT Field Trip notes	IDT	Project Record
32	06.16.08	IDT Notes re: revised assumptions, corrections and proposed mitigation	IDT	Project Record
33	06.18.08	USFS (Washington Office) response to Western Watershed Project re: AUMs and stocking rates(with 03.24.08 letter to USFS	Janette S. Kaiser, Director of Rangeland Management	Jon Marvel, Western Watershed Project

DOC #	DATE	DOCUMENT	AUTHOR	RECIPIENT
		from WWP attached)		
34	06.19.08	Response to scoping - New Mexico Department of Game and Fish (NMDGF)	Matthew Wunder, NMDGF Conservation Services Division	District Ranger
35	06.30.08	Public comment content analysis	IDT	Project Record
36	07.02.08	Response to scoping	Erik Ryberg for Western Watershed Project	District Ranger
37	07.03.08	Response to scoping	USDI, Bureau of Land Management	District Ranger
38	07.09.08	30 day notice and comment request for comments and mailing list	IDT	Interested parties
39	07.10.08	Legal notice in <i>The Taos News</i>	<i>The Taos News</i>	Project Record
40	07.14.08	Response to 30-day notice and comment – New Mexico Environment Department	Georgia Cleverly, Environmental Impact Review Coordinator	District Ranger
41	07.17.08	Heritage Resources Specialist Report	Michael Kyte, District Archaeologist	Project Record
42	08.08/08	Soils, Watershed and Air Specialist Report	Wayne Yonemoto, District Rangeland Staff	Project Record
43	08.10.08	E-mail response in forest database (see #46)	Forest Database	Project Record
44	08.10.08	Response to 30 day notice and comment (received via E-mail)	Jake, Bryan, Eric Vigil	Project Record
45	08.11.08	Response to 30-day notice and comment	Thomas Griego	Project Record
46	08.11.08	Response to 30-day notice and comment	Erik Ryberg for Western Watershed Project, Inc.	Project Record
47	08.13.08	Inventory Standards and Accounting Form – heritage concurrence	NM State Historic Preservation Office	Forest Supervisor
48	08.06.08	Biological Assessment to USFWS	Kendall Clark, Forest Supervisor	Wally Murphy, United States Fish and Wildlife Service
49	08.15.08	Final Issues and Alternatives	Tres Piedras District Ranger	Project Record

DOC #	DATE	DOCUMENT	AUTHOR	RECIPIENT
50	08.26.08	Fisheries Specialist Report	Donna Storch, Forest Fisheries Biologist	Project Record
51	09.04.08	Rangeland Vegetation Specialist Report	Anna Dominguez, District Range Conservationist	Project Record
52	09.11.08	E-mail re: use of AUM term	Daniel Rael, Forest Natural Resources Staff	IDT
53	09.12.08	Special Designations Specialist Report	Ray Martinez, West Zone Recreation Staff	Project Record
54	09.12.08	Wilderness and WSA Specialist Report	Ray Martinez, West Zone Recreation Staff	Project Record
55	09.12.08	Social and Economics Specialist Report	Paula Cote, Forest Planner	Project Record
56	09.18.08	Response to 30 day notice and comment	The Navajo Nation	District Ranger
57	09.21.08	Wildlife Specialist Report with Biological Assessment and Biological Evaluation	Francisco Cortez, District Wildlife Biologist	Project Record
58	09.30.08	USFWS Biological Assessment Concurrence	David Campbell, Acting Field Supervisor	Forest Supervisor