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Environmental Assessment

Horseshoe, Sulphur Draw, Sanford and Cienega Allotments

Douglas Ranger District, Coronado National Forest
Cochise County, Arizona

Township 17 South, Range 31 East, Sections 35, 36.
Township 18 South, Range 31 East, Sections 1, 2, 11-15, 22-28, 31-36
Township 19 South, Range 30 East, Sections 1-3, 10-12, 21-27, 34-36
Township 19 South, Range 31 East, Sections 1-36
Township 20 South, Range 30 East, Sections 1-3, 10-12
Township 20 South, Range 31 East, Sections 2-11

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Chapter 1 – Purpose and Need

Background

This Environmental Assessment (EA) describes a Forest Service proposal to authorize grazing on the Horseshoe, Sulphur Draw, Sanford and Cienega allotments in the Chiricahua Mountains, Douglas Ranger District, Cochise County, Arizona. The EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and one alternative.

Federal actions such as the authorization of grazing must be analyzed to determine potential environmental consequences pursuant to the National Environmental Policy Act of 1969 (NEPA) and the Rescission Act (P.L. 104-19, 1995). The Council on Environmental Quality regulations define an environmental assessment as a “concise public document” that “shall include brief discussions” of the need for the proposal, alternatives to the proposal, discussion of environmental effects based on the substantive issues, and a listing of agencies and persons consulted (40 CFR 1508.9). In order to meet the intent of the regulations with respect to “concise” and “brief”, the text of this environmental assessment will contain references to the contents of the analysis record whenever possible. Throughout this EA, references to supporting documentation are shown in parentheses. For example, a reference “(PR 21)” would indicate that a specific passage in the EA is linked to information contained in document No. 21 in the project record. Supporting documentation is on file in the project planning record in the Coronado National Forest Supervisor’s Office in Tucson, Arizona.

Purpose and Need for Action

The Horseshoe, Sulphur Draw, Sanford and Cienega allotments encompass lands identified as suitable for domestic livestock grazing in the Coronado National Forest Land and Resource Management Plan (Forest Plan, PR 1). Where consistent with the goals, objectives, standards and guidelines of forest plans, it is Forest Service policy to make forage from lands suitable for grazing available to qualified livestock operators¹. The purpose of the proposed action is to authorize livestock grazing in a manner that maintains or improves project area resource conditions and achieves the objectives and desired conditions described in the Coronado National Forest Plan. This authorization is needed here and now because:

- The allotments currently lack sufficient environmental analysis to comply with the Rescission Act (P.L. 104-19, 1995).
- There is a need to incorporate additional flexibility into the management of the allotments in order to allow the Forest Service and grazing permit holders to be able to adapt management to changing resource conditions or management objectives, and to comply with Forest Service Policy (FSH 2209.13 Chapter 90).
- Rangeland vegetation condition and soil condition is less than desirable in many areas as a result of poor distribution. There is a need for management to be more responsive to decrease

¹ Authority to manage National Forest System (NFS) rangeland resources is derived from laws enacted by Congress that authorize the Secretary of Agriculture to administer NFS lands and issue necessary regulations. Summaries of these laws and regulations are found in the Forest Service Manual (FSM) Chapter 2201. Forest Service objectives and policies for rangeland management are found in FSM 2202 and 2203.

the duration and intensity of use in areas with less than satisfactory soil or vegetation condition.

- Permitted use on the allotments exceeds what is considered sustainable. Forest Plan direction (Forest Plan, p. 10) to balance permitted use with capacity is not being met.

Existing Conditions.

Location and Setting. The four allotments are located on the east side of the Chiricahua Mountains (Figures 1 and 2). Elevations range from 4600 feet at the Forest boundary to approximately 9000 feet on Sentinel Peak at the upper end of the Horseshoe Allotment. The allotments are characterized by steep, rugged terrain and are extensively wooded. Major drainages include Horseshoe Canyon, Sulphur Draw and several smaller canyons draining to the east toward the San Simon Valley. Drainages run seasonally in response to precipitation events, but there are no perennial streams in the analysis area. Upper elevations of all allotments are included in the Chiricahua Wilderness.

Vegetation. The project area falls within the Mexican Oak – Pine Woodland and Oak Savannah land resource unit (41-1 AZ) as defined by the Natural Resource Conservation Service. The lowest elevations are Southwest Desertscrub (1265 acres). This type occurs almost exclusively in the Cienega Allotment in the northeast corner of the analysis area. Characteristic species include tarbush (*Flourensia cernua*), Whitethorn acacia (*Acacia neovernicosa*) and mesquite (*Prosopis glandulosa*). Inspection reports in the allotment file and field inspections indicate that prickly pear (*Opuntia* sp), juniper, mesquite and catclaw (*Acaccia constricta*) are encroaching into this vegetation type.

Desert Grassland communities are found at low elevations in the Sanford, Sulphur Draw and Horseshoe allotments, covering approximately 20% (5619 acres) of the analysis area (Figure 3). Dominant native grasses include blue grama (*Bouteloua gracilis*), purple grama (*B. radicata*), sideoats grama (*B. curtipendula*), tanglehead (*Heteropogon contortus*) and vine mesquite (*Panicum obtusum*). The exotic Lehmann lovegrass (*Eragrostis lehmanniana*) is the dominant grass species in the flatter portions of Horseshoe and Sulphur Draw allotments. Agaves (*Agave palmeri*), beargrass (*Nolina microcarpa*), false mesquite (*Calliandra humilis*) and ocotillo (*Fouquieria splendens*) are locally common. Intensive cattle grazing and fire suppression over the past century have changed the appearance and species composition of this community by increasing the presence of shrubby species such as mesquite, snakeweed (*Gutierrezia sarothrae*) and turpentine bush (*Ericameria* sp).

Broadleaf Evergreen Woodlands are the most widely distributed plant community in the project area, occurring over 65% (18,674 acres) of the allotments. The dominant native vegetation is Emory oak (*Quercus emoryi*), Arizona white oak (*Quercus grisea*) and mixed junipers dominated by alligator juniper (*Juniperus deppeana*). Understory species include beargrass, pointleaf manzanita (*Arctostaphylos pungens*), silk-tassel (*Garrya wrightii*) and agaves. Herbaceous plants include the grasses Muhlenbergia, beggartick grass (*Aristida orcuttiana*), plains lovegrass (*Eragrostis intermedia*) and others. Much of the woodland type is found in areas of steep slopes that receive little use by livestock.

Coniferous forest communities (783 acres) are found at the highest elevations in the Horseshoe and Sulphur Draw allotments. Dominant vegetation is a mix of oaks (*Quercus* spp.) alligator

juniper, pinyon pine (*Pinus discolor*), ponderosa pine (*Pinus ponderosa*), southwestern white pine (*Pinus strobiformis*), Gambel oak (*Quercus gambelii*) and Chihuahuah pine (*Pinus leiophylla*). Little if any grazing use occurs in this type. Portions of this plant community were extensively burned during the 1994 Rattlesnake Fire.

Evergreen riparian vegetation (2,344 acres) is found in drainages throughout the allotments, occurring in greatest quantity in Horseshoe Canyon and Sulphur Draw. Dominant tree species include silverleaf oak (*Quercus hypoleucoides*), Emory oak (*Q. emoryii*) Arizona white oak (*Q. arizonica*) and alligator juniper. A small number of deciduous riparian trees, primarily Arizona sycamore (*Platanus wrightii*), are scattered throughout the lower reaches of Horseshoe Canyon and at isolated spring sites. Upper elevations of Horseshoe Canyon support a coniferous riparian plant community comprised of oak and pines. The herbaceous understory in lower Horseshoe Canyon and Sulphur Draw is dominated by Lehman lovegrass.

Grazing Management. All four allotments are grazed by the same permittee. Of the 29,111 acres in the project area, approximately 8000 acres (27%) are considered capable² of supporting grazing. While livestock may occasionally use these non-capable areas, they are not used to calculate grazing capacity. Of the areas considered capable, none have been classified as unsuitable in the Forest Plan. All allotments are permitted for grazing for six months during the winter. Allowable use is set at 45% on the Horseshoe allotment and 50% on the other three. Range monitoring reports and inspection records in the allotment files dating back to 1930 indicate that uneven livestock distribution on the Horseshoe, Sulphur Draw and Cienega allotments has been a long-term problem. Because of the steep, brushy conditions throughout all the allotments, cattle tend to concentrate in riparian bottoms and flatter benches, creating pockets of heavy use. Uneven livestock distribution hinders the attainment of Forest Plan standards for forage utilization, range and soil condition. Recent actual use on the allotments is shown in Table 1. Stocking over the past few years has been low because ongoing drought conditions restrict water availability. Summaries of recent management history and current issues follow below.

The **Horseshoe** allotment comprises 19,744 acres of which 3,571 (18%) are considered capable for grazing. Since 1989 the grazing permit has been for 250 cattle, winter seasonal use between 11/01 and 4/30. Drift fences constructed in the canyon bottoms divide the allotment into six loosely defined pastures. The cattle are placed in the upper pastures of the allotment (North Fork, Upper Horseshoe, Red Hill and Pot Hole) until desired use levels are met or until water becomes limiting. The gates are then opened and the cattle are allowed to drift into Middle Horseshoe pasture. The Lower Horseshoe Pasture is saved for collecting cattle for removal at the end of the season. Improvements include 11 earthen or concrete dams forming stock tanks, four wells and a pipeline from North Fork Dam to two storage tanks and troughs. The stock tanks are not reliable

² Assessment of rangeland capability represents the determination of those areas of land that can support domestic livestock grazing. Capable rangelands are defined as rangelands under 40% slope and capable of producing 100 pounds per acre of dry forage. Suitability refers to the appropriateness of livestock grazing in an area when considered with all resource values and management objectives. Suitability is determined on those acres classified as capable, and is a determination made during the Forest planning process. Analysis at the project level may identify additional areas considered unsuitable for grazing.

in dry years, causing livestock to concentrate around dependable waters in the bottom of Horseshoe Canyon.

During cool periods, cattle will work up from the canyon bottoms on to warmer sites on the side slopes. In wet years, water is also generally more available in the uplands and side drainages, helping to keep cattle out of the canyon bottoms. During warm or dry periods, cattle concentrate in the bottom of Horseshoe Canyon and in a few flat areas in upland desert grasslands near dependable water, creating zones of heavy use.

The **Sulphur Draw** allotment is a one-pasture allotment located directly north of the Horseshoe allotment. Permitted use is set at 72 cattle from 11/1-4/30. There is one developed spring with pipeline, storage tank and drinking trough (Sulphur Spring). Steep slopes, dense vegetation and limited water availability restrict the ability of livestock to distribute evenly. Cattle concentrate in the bottom of Sulphur Draw near available water and on south facing slopes in the desert grasslands near the Forest boundary.

The **Sanford** allotment is a one-pasture allotment grazed in conjunction with private land that borders the Forest. It is permitted for 16 cattle yearlong. Recent authorized use has been 32 cattle for six months (11/1 to 4/30). There are no reliable water sources on the allotment. Gates in the Forest boundary fence are left open to allow cattle access to the water on private land. Because of this, livestock use is typically light.

The **Cienega** allotment is a one-pasture allotment located directly north of the Sanford allotment and adjacent to the community of Portal. The current permit is for 50 cattle, winter seasonal use from 11/1 to 4/30. Actual use on the allotment has been variable in recent years. Water availability is limited on the Forest and the primary source of water is a well on adjacent private land. Overall rangeland condition on the allotment is moderately high with a static trend, but the lack of reliable water and periodic failure to stay within utilization limits has resulted in pockets of impaired soils and poor plant vigor. Cienega Spring in the northeast corner of the allotment supports a notable stand of large deciduous trees. No surface water is available at this site, but the presence of shade attracts cattle. The vicinity of the spring has been identified as a concern for archeological resources. The project files also contain responses to the original scoping that indicate that heavy grazing on this allotment is a concern to the public.

Table 1. Allotment size, stocking and recent use: Horseshoe, Sulphur Draw, Sanford and Cienega Allotments. Recent actual use is shown in head months (HM) which is the number of cattle multiplied by the number of months of use.

		Horseshoe	Sulphur Draw	Sanford	Cienega
Total Acres		19,744	5,635	1,086	2,646
Capable Acres		3,571	2,408	500	1,519
Permitted Use		250 cow/calf (1500 HM)	72 cow/calf (432 HM)	32 cow/calf (192 HM)	50 cow/calf (300 HM)
Management System		6-pasture winter use (11/1-4/30)	1-pasture winter use (11/1-4/30)	1-pasture winter use (11/1-4/30), on-off	1-pasture winter use (11/1-4/30)
Recent	2000-2001	400	118	6	196
Actual	2001-2002	987	195	172	243
use	2002-2003	587	-	97	101
(HM)	2003-2004	no data	no data	no data	no data

		Horseshoe	Sulphur Draw	Sanford	Cienega
	2004-2005	561	204	156	188
	2005-2006	429	224	123	150

Management Direction

The allotments fall within Forest Plan management areas 1, 3, 4, 7 and 9 (Figure 4). Management emphasis for these areas is described below.

Management Area (MA) 1 includes steep, rugged lands that are managed for visual resources and semi-primitive dispersed recreation. Slopes are generally in excess of 40% and sites included in this management area are generally considered unsuited and not capable for livestock grazing. Range management standards and guidelines (Forest Plan pp. 47-49) call for no assigned permitted use for livestock. MA1 areas are limited to a small portion in upper Horseshoe Canyon.

Management Area (MA) 3 includes undeveloped areas that have a high attraction to recreationists. Management emphasizes a variety of dispersed recreational opportunities while protecting or maintaining the unique physical, biological and cultural resources (Forest Plan p. 57). The non-wilderness portion of the Cienega allotment falls within MA3.

Management Area (MA) 4 includes a variety of vegetation types on lands under 40% slope. They are generally considered capable and suitable for livestock grazing. Management emphasis is on a “sustained harvest of livestock forage and fuelwood while maintaining or improving game animal habitat” (Forest Plan p. 62).

Management Area (MA) 7 includes lands that have been “identified as supporting flora and fauna associations that are unique enough to require special management practices... Includes riparian ecotypes.” Management emphasis is to manage these areas to benefit riparian dependant resources (Forest Plan p. 67). Non-wilderness riparian bottoms in Horseshoe Canyon and Sulphur Draw are designated as MA7.

Management Area (MA) 9 includes vegetative and landform types that have been determined to be suitable for wilderness designation. Management emphasizes wilderness values while providing livestock grazing and recreational opportunities that are compatible with maintaining wilderness values and protecting resources (Forest Plan p. 79). Forest Plan standards and guidelines limit utilization to 35% (Forest Plan p. 116). Portions of all four allotments fall within the Chiricahua Wilderness.

Desired Condition

The Coronado National Forest Plan identifies the following goals for the range, wildlife, soil, water and lands, wilderness and recreation programs on the Forest (Forest Plan pp. 9-11).

- To restore rangeland to at least moderately high ecological condition (70% to 75% of potential production, fair range condition) with stable soil and a static to upward trend.
- Produce livestock products consistent with other resources and uses.
- Eliminate grazing from areas not capable of supporting livestock without significant detriment to range or other resources.

- Balance permitted grazing use with grazing capacity.
- Provide habitat for wildlife populations consistent with the goals outlined in the Arizona and New Mexico Department of Game and Fish Comprehensive Plans and consistent with other resource values.
- Provide for ecosystem diversity by at least maintaining viable populations of all native and non-native wildlife, fish and plant species through improved habitat management.
- Improve the habitat of and protection for local populations of Threatened and Endangered species to meet the goals of the Endangered Species Act.
- Provide a favorable flow of water in quantity and quality for off-forest users by improving or maintaining all watersheds to a satisfactory or higher level.
- Allow the use of available National Forest lands for appropriate public or private interests consistent with National Forest Policies.
- Protect significant cultural resources from damage by project activities or vandalism.
- Manage existing wildernesses to preserve and protect the wilderness character in accordance with the various wilderness acts.

Based on Forest Plan guidance and site-specific knowledge of the allotments, the following objectives constitute the desired condition for the analysis area.

- Livestock stocking is consistent with annual forage production and use is monitored annually. Management controls livestock use and distribution so that sufficient herbaceous vegetation is retained to protect soils and provide herbaceous wildlife cover; zones of heavy use are minimized.
- Ecological sites within the four allotments have stable soils, functional hydrology and support functional biotic communities. All areas are in moderately high (good) range condition or better.
- Lower elevation sites are dominated by warm season native perennial grasses and are increasing in diversity of grasses, forbs and shrubs.
- Native vegetation in evergreen riparian bottoms is a diverse mix of perennial grasses, forbs and shrubs. Native perennial grasses dominate herbaceous species throughout the understory. Annual forbs are less than 20% of the understory community. Trees show no evidence of high-lining and shrubs are not hedged. Riparian bottoms throughout the allotments provide suitable year-round habitat for Mearns' quail and other species dependant on herbaceous cover.
- Open meadows and other areas of historic heavy livestock use have increasing ground cover and litter and stable soils.
- Deciduous riparian species show a wide range of age classes and new trees are sprouting as older trees mature.

- Wilderness values are preserved and grazing within wilderness does not exceed capacity.
- Occupied habitats for threatened, endangered, sensitive and management indicator species are maintained or improved and recovery objectives are being met.
- All grazing improvements on all allotments are in proper working order and are contributing toward improved livestock distribution and pasture reliability.

Decision Framework

The Douglas District Ranger is the official responsible for decisions regarding management of the Horseshoe, Sulphur Draw, Sanford and Cienega allotments. Based on the results of the NEPA analysis, the Ranger will issue a decision document or documents that include(s) a determination of the significance of the environmental effects and whether an environmental impact statement will be prepared. The decision(s) will also include a determination of consistency with the Forest Plan, National Forest Management Act, National Environmental Policy Act and applicable laws, regulations and executive orders.

If the District Ranger determines it is not necessary to prepare an environmental impact statement, the Ranger will decide whether or not livestock grazing will continue to be authorized. If grazing continues to be authorized, the Ranger would determine which management actions, mitigation measures and monitoring requirements would be prescribed in the AMPs, including permitted number of animals, season of use, allowable utilization standards and the term of the permits. These decisions may be made separately for each allotment. That is, the District Ranger may decide to authorize grazing on one or more allotments, and not on others, or may select different alternatives for different allotments.

Public Involvement

The proposal was listed in the Forest's Schedule of Proposed Actions beginning in July 2002. Public scoping for the proposed action was first initiated on March 16, 1999 (PR 7-19) but further analysis was delayed pending the completion of other projects. A revised public scoping report was issued in July 2003 (PR 47). Six additional comments were received in response to this solicitation. Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address.

In May and June 2007, a draft of the EA (PR 80) was provided to parties who had expressed interest in the project. The public was also notified of the opportunity to comment through a legal notice published in the Douglas *Daily Dispatch* on May 29, 2007 (PR 80). Two comment letters were received in response to this solicitation (PR 81-82). I considered these comments in reaching my decision; the EA was clarified to address the concerns identified. A summary of these comments and a Forest Service response is contained in the project record at PR 83.

Issues

The Forest Service categorized and sorted comments received into issues and non-issues. Issues are defined as a concern or debate about the effects of the proposal. Issues were further categorized as key issues (significant issues used to develop alternatives to the proposed action and other issues (concerns that are addressed through mitigation measures or project design). The

effects analysis in Chapter 3 is built around the identified issues. Comments not considered issues to analyze in this EA were identified as those that were: 1) outside the scope of the proposed action and thus irrelevant to the decision being made; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) conjectural and not supported by scientific or factual evidence.³ An analysis of the issues and scoping responses is included in the Record as PR 54.

Key Issues

No issues were identified that could not be addressed through mitigation or project design modifications.

Other Issues

Other issues and concerns are identified below. Project design features and mitigation measures have been developed to address these other issues.

Wildlife – Continued grazing in the project area could result in effects to wildlife, including listed and sensitive species and their habitats. Effects could be either positive or negative depending on the timing, intensity, frequency and duration of grazing and other management activities.

Soil and watershed condition – Topographic and vegetative features on the allotments cause cattle to concentrate in areas with impaired soils and moderately low range condition. Lack of litter, soil compaction, low plant vigor and shrub encroachment are evident in concentration areas.

Upland vegetation – Continued grazing on the allotments could lead to changes in the composition, structure and vigor of upland vegetation and could affect the condition and trend of rangeland resources. Effects could be either positive or negative depending on the timing, intensity, frequency and duration of grazing and other management activities.

Heritage Resources – Concentrations of livestock and construction of range improvements may affect historic and prehistoric sites located within the project area.

Grazing Intensity – Several comments identified excessive utilization, especially on the Cienega and Horseshoe Allotments as an issue.

Grazing Capacity/Permit numbers - Some comments identified grazing capacity and/or permit numbers as an issue. Grazing capacity is an expression of the number of grazing animals that can be sustained on a management unit over time without deterioration of the ecosystem. The Forest Service estimates allotment capacity based on forage production and utilization studies and on records of actual use on the allotments and the effects of this use on resource conditions. Updated capacity estimates have been considered and incorporated into the proposed action (PRs 2, 3, 4,

³ The Council on Environmental Quality (CEQ) NEPA regulations require this 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)..."

40, 41). Although capacity can be estimated at a point in time, allotment capacity is dynamic. It is a function of annual precipitation, management intensity, allotment infrastructure (waters and fences), nutrient resources available, grazing methods, and management objectives, including non-livestock related objectives. Changes in any of these parameters will change estimated capacity on a given management unit. The Forest Service monitoring data used to calculate grazing capacity for the analysis were collected and interpreted in accordance with Forest Service policy and represent the best available science, Forest Plan direction and the professional judgment of the District Range Staff. The estimates provide a baseline for initial stocking rates proposed, but the Forest Service recognizes that the capacity of individual allotments may increase or decrease over the term of the authorizations, based on changes in the factors that influence capacity.

Allotment capacity is ultimately expressed as numbers on a term grazing permit. These numbers have significance to permittees who buy and sell ranches or borrow money based on a value associated with the permit numbers. They also have significance to anti-grazing advocates who equate high livestock numbers with the potential for over-grazing. Notwithstanding these positions, the Forest Service must focus its analysis on the effects of grazing. Permit numbers by themselves do not cause resource effects. Effects are the result of the application of the timing, duration, frequency and intensity of livestock use. These factors can be influenced by a variety of management actions, the most important of which is the selection of the proper stocking rate. Simply stated, the stocking rate is the number of animals placed on a unit of land for a prescribed period of time. The determination of the stocking rate, based on monitoring of current conditions is the critical decision on an annual basis. Using adaptive management, the stocking rate will need to be continually adjusted to adapt to changing resource conditions in order to keep use within capacity on the allotments.

In developing the proposed action and alternatives, the Forest Service focused on the desired conditions identified for the project area. The analysis of predicted effects is focused on the timing, duration and intensity of grazing, the intensity of management and degree of infrastructure development proposed. Monitoring of the effects of these actions will be the basis for modifying the stocking rate on a year-to-year basis in order to achieve desired conditions.

Additional considerations in this EA include potential effects to air quality, water quality and quantity, wilderness values and social resources including economics. Effects on these resources are evaluated through specialist's reports and consultation with tribes and regulatory agencies.

Chapter 2 - Alternatives

This chapter describes and compares the alternatives considered for the management of the Horseshoe, Sulphur Draw, Sanford and Cienega Allotments. This section presents the alternatives in comparative form, in order to define the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Mitigation and monitoring measures incorporated into the alternatives are also described.

Alternatives Eliminated From Detailed Study

Continue Current Management. Under this alternative, there would be no change in allotment management. As permits expire, new permits would be issued for the classes and numbers of livestock currently permitted. Annual authorized use would continue to be controlled through annual operating instructions. None of the proposed improvements would be implemented, but existing improvements would be maintained. This alternative assumes management intensity, utilization and distribution patterns similar to the past five years. This alternative was dropped because it does not meet the purpose and need to authorize livestock grazing in a manner that achieves Forest Plan objectives and desired conditions on three of the four allotments. The Sanford allotment currently meets Forest Plan standards; however, the proposed action does not propose substantive changes in management on this allotment.

Alternative 1 - No Action

Under this alternative, grazing would not be authorized and use of the allotments by domestic livestock would be discontinued. The current permit, which expires in 2007, would not be renewed. Existing structural improvements would remain in place but would not be maintained. Improvements contributing to resource protection or enhancement, such as water developments important for wildlife, would be maintained where feasible using other program funds. Periodic inspection of structural improvements would be used to determine whether maintenance or removal is needed. Removal or maintenance of improvements would be authorized by a separate decision. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees with the understanding that livestock are to be kept off of the allotments.

Alternative 2 - The Proposed Action

The proposed action is to authorize managed livestock grazing on the Horseshoe, Sulphur Draw, Sanford and Cienega allotments. The proposed action consists of four components - **authorization, improvements, management practices and monitoring** – and will be implemented using an adaptive management strategy.

Authorization

Livestock grazing would be authorized under the following terms and conditions.

Duration and timing of grazing. Use on the allotments will be authorized during the winter dormant season to insure that pastures receive annual summer growing season rest in order to provide for grazed plant recovery. The sequence and timing of pasture moves and specific on/off

dates will be set annually based on monitoring of range readiness, ecological condition, and utilization.

Intensity of grazing. Forage utilization will be managed at a level corresponding to light to moderate intensity⁴ in order to provide for grazed plant recovery, increases in herbage production and retention of herbaceous litter to protect soils. Consistent patterns of utilization in excess of 45% of key species in key areas would be used as a basis to modify management practices or take administrative actions necessary to reduce utilization in subsequent grazing seasons. Within the Chiricahua Wilderness, forage utilization will be limited to 30-35% in compliance with Forest Plan standards and guidelines (Forest Plan pp. 81, 116).

Administrative action necessary to implement the decision. The following administrative actions will be used to implement the NEPA-based decision to authorize grazing.

- **Permit Issuance.** New 10-year term grazing permits would be issued for each allotment for the following numbers and terms. Permits would be issued in animal unit months (AUMs) to reflect the estimated capacity of the allotments⁵. Using adaptive management, actual numbers of livestock may vary based on the class of livestock and duration of use. All of the allotments are currently managed as cow/calf operations.
 - **Horseshoe:** Up to 1584 AUMs seasonal use between November 1-April 30 (equivalent to 200 cow/calf pairs for six months).
 - **Sulphur Draw:** Up to 436 AUMs seasonal use between November 1 and April 30 (equivalent to 55 cow/calf pairs for a six month period within this season).
 - **Sanford:** Up to 158 AUMs seasonal use between October 15 and April 30 (equivalent to 20 cow/calf pairs for a six month period within this season).
 - **Cienega:** Up to 317 AUMs seasonal use between October 1 and April 30 (equivalent to 40 cow/calf pairs for a six month period within this season).

⁴ Based on review of numerous grazing intensity studies, Holechek (1999, 2004) identifies light to moderate grazing as 32-43% average use of primary forage species. These averages are based on pasture-wide utilization averaged over time. The Forest Service monitors utilization based on the use of key forage species in key areas. Key areas are selected to be representative of management effectiveness over the entire pasture. For the purposes of monitoring, an annual use guideline of 30%-45% of key species in key areas will be used to monitor use in all pastures, which, combined with growing season rest or deferment, should insure pasture-wide *average* use of less than 45%. (Holechek, J.L, T.T Baker and J.C, Boren. 2004. Impacts of controlled grazing verses grazing exclusion: What we have learned. Range Improvement Task Force Report # 57. New Mexico State University, Las Cruces, NM.. PR 60).

⁵ An animal unit month (AUM) is a measure of the amount of **forage** required by a 1000 lb cow or its equivalent for one month based on a daily allowance of 26 lbs. dry forage per day. It is not synonymous with animal month (or head-month), which is an expression of one month's occupancy of the range by an animal. A cow/calf pair is 1.32 AUM; a yearling is 0.7 AUM.

Proposed permitted use is based on forage production and utilization surveys (PRs 2, 3, 4, 40, 41), on records of actual use on the allotments over the past 10-15 years and the effects of this use on resource conditions. Permitted use reflects the estimated average annual forage production (AUMs) available for livestock on the allotments considering the duration, timing, frequency and intensity of grazing proposed, and assumes proper livestock distribution.

In issuing new permits, the Forest Service in cooperation with the permittee, may combine some or all of the allotments into one or more larger units. This would be an administrative action intended to simplify permit administration. It would not affect the timing, intensity or duration of grazing proposed or change permitted use.

- **Allotment Management Plans.** New allotment management plans (AMPs) would be developed for each allotment and will be incorporated into the grazing permits. The AMPs will identify specific goals and objectives of management, management strategies, range improvements and monitoring requirements. The AMPs will incorporate an adaptive management strategy described below. Using adaptive management, specific numbers of livestock, pasture rotations and the length of time livestock are allowed on the allotments each year would be set annually based on monitoring of resource conditions and management objectives for the allotments.
- **Annual Operating Instructions (AOI).** On an annual basis the Forest and permittee will jointly prepare an annual plan, referred to as the AOI, that sets forth:

The numbers, class of livestock, and the timing and duration of use for the current season.

The planned sequence of grazing in pastures on the allotment(s), and the monitoring criteria that will be used to make changes.

Structural and non-structural improvements to be constructed, reconstructed, or maintained and who is responsible for these activities.

Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.

Monitoring for the current season that may include, among other things, documentation demonstrating compliance with the terms and conditions in the grazing permit, AMP and AOI.

Improvements

Structural range improvements proposed to promote improved livestock distribution in the Horseshoe allotment are listed below. These improvements have been proposed in the context of adaptive management, meaning that they have been identified as possible practices to assist in the achievement of desired conditions if management alone is not sufficient. Future monitoring may indicate that the projects are not necessary, in which case they will not be implemented. Two additional improvements intended to protect archeological resources are identified in the Mitigation section.

- Construct a drift fence across the mouth of Pothole Canyon in the north half of Section 14, T19S, R31E to keep cattle out of the bottom of Horseshoe Canyon.

- Extend a pipeline from an existing source in the bottom of Horseshoe Canyon .25 mile up Pothole Canyon to a drinker in the south half of Section 11, T19S, R31E.
- Line Licklog Dam in upper Horseshoe Canyon (T19S, R31E, Section 18, SE ¼) and fence the water to control access.
- Extend a pipeline from Warner Well west into the upper portion of Middle pasture (T19S, R31E, Section 22, NW ¼).

Typically, improvements are funded on a cost-share basis with the Forest Service providing materials and the permittee providing the labor to construct or install the improvement. Forest Service funding for all of the improvements is not currently available and funding constraints will likely require the projects to be completed over a period of years. The permittee will be notified of funding constraints and encouraged to pursue alternative sources of funding if they wish to expedite completion of the developments.

Management Practices

Management practices include measures to reduce or avoid resource impacts that are incorporated into the project design. These measures have been used on previous projects and are considered to be effective at reducing environmental impacts. They are consistent with applicable Forest Plan standards and guidelines and the terms and conditions and conservation measures of existing biological opinions. Implementation of these practices in combination with the duration, timing and intensity of grazing proposed is intended to avoid the occurrence of adverse environmental impacts.

Soil, Water and Vegetation – the objective is to mitigate effects of livestock grazing and facility construction through the use of Best Management Practices (FSH 2509.22) and adaptive management. Practices include, but are not limited to the following.

- Utilization of key upland herbaceous forage species in key areas will be managed to achieve the goal of light to moderate grazing as a pasture average. The objective is to protect plant vigor, provide herbaceous residue for soil protection and to increase herbage producing ability of forage plants. A utilization guideline of 30-45% use of key species in key areas will be used to achieve this objective.
- Necessary techniques will be used to achieve proper distribution or lessen the impact on sensitive areas. Practices include herding, salting and controlling access to waters. Salt or similar solid supplements will be placed on good feed, one quarter to one half mile from waters and salting locations will be moved annually. Placement of liquid supplements will require prior approval of the District Ranger.
- No hay or bulk feed will be placed on Forest lands in order to minimize the introduction of weed seeds.

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

- All water developments will include wildlife access and escape ramps. Water developments will be maintained year-round for use by wildlife.
- All new fencing will be built to Forest Plan standards (Forest Plan, p. 35) to provide for wildlife passage through the fence. At a minimum, this will be a 4-strand fence with smooth bottom wire 16 inches off of the ground and a total height of 42 inches or less.

- Range construction projects will be designed to avoid the destruction of agaves. If impacts to agaves are unavoidable, the Forest will insure that no more than 1% of agaves within 800 meters of a project are impacted.
- All proposed range facilities will be surveyed for threatened, endangered or sensitive species prior to any ground-disturbing activities. Facilities will be designed and constructed to have no adverse effect on listed species.
- Within areas meeting the definition of high quality Mearns' quail habitat, herbaceous vegetation will be managed to maintain a minimum of 6 inches of herbaceous stubble height, which is generally interpreted as less than 45% utilization of key herbaceous species (PR 64). The objective is to provide herbaceous vegetation as cover for quail and other wildlife.

Heritage Resources – the objective is to protect heritage resources (historic and prehistoric sites) from impacts caused by range construction projects or livestock concentration.

- Before any range facilities are constructed, the Forest Archeologist will be contacted to determine if archeological survey is needed. All proposed range facilities will be surveyed by qualified personnel for heritage resources prior to any ground-disturbing activities. Facilities will be located avoid impacts to heritage resources.
- If unrecorded sites are discovered during the course of project implementation, activities will cease and the Forest or District Archeologist will be notified.
- No salting will occur within or adjacent to identified heritage sites.
- If impacts from grazing (e.g. excessive trampling, cattle rubbing against and knocking down standing features) are occurring to heritage sites, measures will be taken (e.g. fencing) to protect them.
- Approximately 10 acres around Cienega Spring on the Cienega allotment will be fenced to protect cultural and riparian resources (T17S, R31E, Section 36, NE ¼).
- A sensitive archeological site in the bottom of Horseshoe Canyon will be fenced to exclude livestock.

Monitoring

The objective of monitoring is to determine whether management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions.

Effectiveness monitoring includes measurements to track condition and trend of upland and riparian vegetation, soil, and watersheds. Monitoring will be done following procedures described in the interagency technical reference⁶ and the Region 3 Rangeland Analysis and Training Guide.⁷ These data are interpreted to determine whether management is achieving desired resource conditions, whether changes in resource condition are related to management, and to determine whether modifications in management are necessary. Effectiveness monitoring will

⁶ Sampling Vegetation Attributes, Interagency Technical Reference. 1996. Cooperative Extension Service, USDA Forest Service and Natural Resources Conservation Service, and USDI Bureau of Land Management

⁷ Rangeland Analysis and Management Training Guide. 1997. USDA Forest Service, Southwestern Region.

occur at least once over the ten-year term of the grazing authorization, or more frequently if deemed necessary.

Implementation monitoring will occur yearly and will include such things as inspection reports, forage utilization measurements in key areas, livestock counts and facilities inspections.

Utilization measurements are made following procedures found in the Interagency Technical Reference⁸ and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands (PR 61).

Utilization will be monitored on key forage species, which are native perennial grasses that are palatable to livestock. At a minimum monitoring will include use in key areas⁹, but may include monitoring outside of key areas. The Douglas District Range Staff Officer and the permittees will be responsible for monitoring livestock grazing utilization. Over time, changes in resource conditions or management may result in changes in livestock use patterns. As livestock use patterns change, new key areas may be established and existing key areas may be modified or abandoned in cooperation with the permittee.

The permittee will be encouraged to participate in monitoring activities. Records of livestock numbers, movement dates and shipping records will be kept by the permittee and will be provided to the District Range Staff annually.

Adaptive Management

Adaptive management is a tool that uses the documented results of management actions to continually modify management in order to achieve specific objectives. The proposed action is designed to provide sufficient flexibility to adapt management to changing circumstances. If monitoring indicates that desired conditions are not being achieved, adaptive management decision will be used to modify management. Such changes may include administrative decisions such as the specific number of livestock authorized annually, specific dates for grazing, class of animal or modifications in pasture rotations. However, but such changes will not exceed the limits for timing, intensity, duration and frequency defined in the term grazing permit. Adaptive management will be implemented through annual operating instructions, which will adjust livestock numbers and the timing of grazing so that use is consistent with current productivity and is meeting management objectives.

Adaptive management also includes monitoring to determine whether identified structural improvements are necessary or need to be modified. In the case that changing circumstances require physical improvements or management actions not disclosed or analyzed herein, further

⁸ Utilization Studies and Residual Measurements. Interagency Technical Reference. 1996. Cooperative Extension Service, USDA Forest Service and Natural Resources Conservation Service, and USDI Bureau of Land Management. Revised 1999.

⁹ A key area is a portion of rangeland selected because of its location, use or grazing value as a monitoring location for grazing use, range condition and trend. Key areas are usually ¼ to 1 mile from water, located on productive soils on level to intermediate slopes where prescribed use will occur first. They are 5 acres or more in size. Properly selected key areas will reflect the overall acceptability of current management.

interdisciplinary review would occur. The review will consider the changed circumstances and site-specific environmental effects of the improvements in the context of the overall project. Based on the results of the interdisciplinary review, the Ranger will determine whether correction, supplementation or revision of the EA is necessary in accordance with Forest Service Handbook direction at FSH 1909.15(18) and FSH 2209.13(96.1), or whether further analysis under NEPA is required.

Future Review of the Decision

In accordance with Forest Service Handbook direction (FSH 1909.15(18) and 2209.13(96)) an interdisciplinary review of the decision will occur within 10 years, or sooner if conditions warrant. If this review indicates that management is meeting standards and achieving desired condition, the initial management activities will be allowed to continue. If monitoring demonstrates that management options beyond the scope of the analysis are warranted, or if new information demonstrates significant effects not previously considered, further analysis under NEPA will occur.

Chapter 3 - Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. The section is organized by resource. Within each section, the affected environment is briefly described, followed by the environmental consequences (effects) of implementing each alternative.

Wildlife

Affected Environment

The high structural and plant species diversity in the project area provides habitat for a wide variety of wildlife. The primary issue related to wildlife is the effect of heavy grazing in riparian bottoms in the project area and the subsequent impacts on herbaceous cover that provides habitat for Montezuma (Mearns') quail and other species.

Management Indicator Species. Forest Plan direction for Management Indicator Species (MIS) is to maintain or improve occupied habitat (PR 1, 62). Forest-wide trends of all MIS have been assessed and are reported in the Forest-wide Status Report for Management Indicator Species (PR 62). The background information and conclusions of this report are incorporated by reference. Five species and the group of cavity nesters are known to occur or potentially occur within the project area (Table 2). A description of the selection criteria and in-depth evaluations of project-level impacts are contained in a separate report (PR 63).

Table 2. Management Indicator Species considered for the analysis.

Species	Evaluation for the Analysis
Primary and secondary cavity nesters	Suitable habitats present throughout project area. Monitored through breeding bird survey routes.
Blue-throated hummingbird	Not documented from project area, but suitable habitat found at upper elevations. Indicator for riparian.
Buff-breasted flycatcher	Suitable habitat in Horseshoe, Sulphur Draw. Not detected during surveys in 2000. Indicator for species needing diversity.
White-tailed deer	Occurs throughout all four allotments. Indicator for species needing diversity and herbaceous cover.
Black bear	Found in all four allotments; extensive suitable habitat in Horseshoe and Sulphur Draw. Indicator for riparian species and species needing diversity.
Mearns' quail	Mapped high density habitat in all four allotments. Extensive suitable high quality habitat. Indicator for herbaceous cover.

Threatened, Endangered and Sensitive Species. Listed or proposed threatened or endangered species that potentially occur in the project area are shown in Table 3. A total of 42 Forest Service Sensitive Species¹⁰ have been identified as occurring in the project area or for which suitable habitats may be present. These species are identified in the effects analysis found below. Not all Sensitive species have been documented in the project area and their presence or absence may not

¹⁰ USDA Forest Service Region 3. Regional Forester's Sensitive Species List. July 21, 1999

be detected within the time frame of the analysis. In the absence of definitive surveys for all species, their presence is assumed based on the availability of suitable habitat.

Table 3. Threatened, Endangered and Proposed Species considered for the analysis.

Common Name	Status	Comments
Lesser long-nosed bat <i>Leptonycteris curasoae yerbabuenae</i>	Endangered	Foraging habitat on all allotments (low densities of agaves). Unsurveyed mine adits and caves in the project area represent potential roost sites, but not all have been surveyed.
Jaguar <i>Felis onca</i>	Endangered	Since 2002, jaguars have been photographed twice in the Peloncillo Mountains, approximately 20 miles southeast of the project area. Given the relative orientation to historic and recent jaguar observations, the rugged characteristics of the allotments and the wide-ranging habits of jaguars, all four allotments are considered to have some potential as travel corridors or hunting areas.
Mexican spotted owl <i>Strix occidentalis mexicana</i>	Threatened Critical habitat	Five Mexican spotted owl protected activity centers (PACs) are located in the Chiricahua Mountains, outside of the project area. Portions of the analysis area are mapped as critical habitat (FR 68 65020)
Chiricahua leopard frog <i>Rana chiricahuensis</i>	Threatened	No records from the project area. Historic records and suitable and potential habitats within five miles. Limited suitable habitats in the project area.

Other Wildlife. The Forest Plan standards and guidelines for the five management areas included in the allotment group include additional species that are to be considered in activities that implement the Forest Plan. These species are shown in Table 4 and existing population and habitats are discussed below. Descriptions of the Management Areas are found in pages 3-4 in this EA.

Table 4. Wildlife species for which the Forest Plan specifies an objective to maintain or improve occupied habitat in selected management areas.

Species	MA1	MA 3	MA 4	MA 7	MA 9
Gambel's quail	X		X		X
Mule deer	X	X	X	X	X
Javelina	X	X	X	X	X
Cottontail	X	X	X	X	X
Apache fox squirrel		X		X	X
Raptors	X	X	X	X	X

Environmental Consequences:

Management Indicator Species.

Montezuma (Mearns') Quail (*Cyrtonyx montezumae mearnsi*). This species is identified as a priority bird species in the Arizona Partners in Flight Bird Conservation Plan (Latta, et. al. 1999). An estimated 10,845 acres of high density Mearns' quail habitat is found on the four allotments, which is less than 5% of the total occupied habitat on the Forest. The amount of potential habitat has not changed significantly since 1986, but Forest-wide habitat suitability has likely improved as a result of improved livestock management over the past two decades. Many areas within the Horseshoe and Sulphur Draw Allotments meet the criteria of high quality habitat characterized by 20% or greater crown cover of oak and/or manzanita, and open grassland within 45 meters of such overstory (PR 64). Forest Service Manual guidance (PR 64) restricts grazing in mapped

high density Montezuma quail habitat to 45% by weight. Coveys of birds have been observed during allotment inspections.

The maintenance of grass height over 6" is necessary to provide sufficient cover for the birds to hide from predators. Current management results in utilization levels from 50%-80% in suitable Mearns' quail habitat in portions of the lower pastures on the Horseshoe and Sulphur Draw allotments. Many of these areas do not appear to provide sufficient herbaceous cover during the spring and early summer following the grazing season.

Alternative 1 (No Grazing) would result in measurable increases in perennial bunchgrasses that provide cover for quail. However, light to moderate grazing that leaves adequate cover apparently benefits habitat quality when compared to ungrazed areas by increasing the availability of quail food resources (Brown 1982, Heffelfinger and Olding 2000) so the No Action alternative may not be optimum for Mearns' quail. Because Montezuma quail are highly correlated with the amount and timing of summer rainfall, and because quail habitat is well distributed throughout the allotments, the effects of no grazing alone on quail populations may not be detectable.

Alternative 2 (Proposed Action) would limit utilization to 45% or less across the allotments. Additional fencing and installation of waters should improve livestock distribution. Successful achievement of moderate utilization will be contingent on active monitoring throughout the grazing season and timely adjustments in management if utilization is too heavy. Assuming monitoring and management is sufficient to limit utilization to 45% or less, the amount of residual herbaceous cover remaining at the end of the growing season is expected to improve over current conditions and should be sufficient to provide year-round habitat for Montezuma quail. Relatively small areas of heavy use will persist around waters and along fencelines, but the size of these areas should be reduced. Because quail populations are highly correlated with summer rainfall, the effects of the proposed action alone on quail populations in the analysis area may not be quantifiable.

In summary, localized changes in local Mearns' quail habitat conditions may occur under both alternatives, but such changes are not expected to affect Forest-wide populations for Mearns' quail.

White-tailed deer (*Odocoileus virginianus couesi*). The entire project area (approximately 29,000 acres) is considered suitable habitat, and represents 2.0 percent of the total occupied habitat on the Forest. Habitat and population trends are considered stable (PR 62, 63). The species will use a variety of habitats but prefers areas of thicker cover. The presence of freestanding water is important for suitable whitetail habitat and they no doubt benefit from the presence of permanent livestock waters in the allotments. Overgrazing by livestock may reduce available grass cover and lead to increased livestock use of browse plants and forbs used by deer. However, steep slopes throughout much of the analysis area restrict the movement of livestock into many areas that are readily used by white-tailed deer.

White-tailed deer preferentially use shrub thickets on the sides of major drainages, especially where perennial grass understory provides sufficient cover. Inspections of the allotments indicate that even when the canyon bottoms and flatter open hillsides are heavily grazed, very little use of perennial grass plants occurs on adjacent hillsides that provide whitetail deer cover. Steep slopes and dense canopy render approximately three quarters of the analysis area unsuitable for grazing. In general, these unsuitable areas provide the better white-tailed deer habitats on the allotments.

Under Alternative 1, no grazing would result in the greatest retention of herbaceous cover for fawning and would eliminate the potential for forage competition between livestock and deer throughout the four allotments. However, suitable white-tailed deer habitat is well distributed and

livestock use is restricted a relatively small percentage of the available habitat, primarily canyon bottoms and adjacent slopes, during a six-month period.

Under Alternative 2, light to moderate grazing intensities proposed should reduce livestock utilization on palatable shrubs during the winter grazing season and reduce the potential for dietary overlap between cattle and deer. The amount of residual herbaceous cover in canyon bottoms at the end of the grazing season is expected to increase. Plant vigor and soil condition are expected to improve under a lighter grazing regime, but areas that would undergo the most improvement are not considered high quality deer habitats because they are in open, grassy areas.

Implementation of the proposed action will maintain occupied habitats for white-tailed deer in the analysis area and may increase the amount and vigor of preferred deer forage plants. Habitat occupancy may change seasonally as livestock concentrations displace deer during the grazing season. Occupied habitats may increase slightly over the term of the project, but the effects are not expected to contribute significantly to forest-wide changes in white-tailed deer populations.

Black Bear (*Ursus americanus*). Black bears are wide ranging habitat generalists that prefer areas of dense cover and high vegetative diversity. They are included in the Riparian Species, Species Needing Diversity and Game Species indicator groups in the Forest Plan. Black bears potentially occur throughout all of the four allotments and the project area represents 4.5% of the occupied habitat on the Forest. Because of its remote nature and good potential as bear habitat, Horseshoe Canyon is identified by the Arizona Game and Fish Department as a release site for nuisance black bears.

Grass has been shown to be a very important component of bear diets in the spring (April-June), which may force both bears and livestock to use the same areas to meet nutritional requirements. This may increase the potential for bear depredation on livestock during years of poor forage production. However, no reports of bear depredation are found in allotment files. Under the proposed action, the allotments are grazed during the winter and spring (November-April), when bears are not active, thereby reducing the potential for depredation. During April, when bears become active in the allotments, livestock are usually at lower elevations and away from the best bear habitats. Implementation of the no action alternative will not affect black bears because livestock would not be present on the allotments. No changes in occupied habitats are expected as a result of the alternatives, nor would either of the alternatives contribute to significant changes in forest-wide populations of black bears.

Primary and secondary cavity nesters. Primary and secondary cavity nesters potentially occur in all plant communities in the project area. In general, cavity nesters require large, older age class trees and snags to provide a suitable substrate for cavities. Grazing-related activities that affect cavity nesters are those that change the rate of regeneration of cavity forming trees. Grazing practices and long-term fire suppression in southeastern Arizona often have resulted in an increase in woody plants in uplands. Some of these species (oak, juniper) eventually grow large enough to provide suitable nesting cavities. Improved management in the form of growing season rest for grass plants may slow the rate of recruitment of woody species over the long term. In riparian areas, grazing potentially reduces the number of large trees through trampling or consumption of small trees by livestock. Within the 28,663 acre analysis area, 20,601 acres (72%) are classified as broadleaf woodland, coniferous forest or riparian, all of which provide abundant mature trees for cavity nesters. Neither of the alternatives is anticipated to significantly affect the amount or distribution of trees in the area. No direct, indirect or cumulative impacts are anticipated that would contribute to significant changes in Forest-wide populations of cavity nesters. It is unlikely that cavities are limited within the analysis area.

Blue-throated hummingbird (*Lampornis clemenciae*). This is the largest hummingbird found north of Mexico. In the Chiricahua Mountains, it breeds in moist pine-fir and pine-oak canyons and higher elevation sycamore-maple riparian areas. The species is a management indicator for riparian habitat on the Forest. Blue-throated hummingbirds appear to be tolerant of human activity, but are susceptible to activities that degrade preferred riparian forest habitats. The species appears to be highly correlated to the presence of running water, which is not found in the project area. There are no records from the project area and suitable habitat is limited, but the bird is a fairly common summer resident in nearby Cave Creek Canyon. Suitable habitats for blue-throated hummingbirds, if they exist on the analysis area, are all above elevations where grazing currently occurs or would occur. In addition, the species is found on the Forest primarily during the spring and summer when livestock are not on the allotments. Therefore, implementation of either of the alternatives is not expected contribute to significant changes in Forest-wide populations of the species.

Buff-breasted Flycatcher (*Empidonax fulvifrons*). The known breeding range in the U. S. for this species is higher elevations (above 6,000 feet) of several mountain ranges in southern Arizona, including the Chiricahua Mountains, where they inhabit open pine-oak woodlands and montane riparian forests with an understory of grasses. Buff-breasted flycatchers are an indicator for Species Needing Diversity in the Forest Plan. Populations of buff-breasted flycatcher appear to be influenced by events such as fire that create or maintain an open grass understory in the bird's pine-oak woodland habitat. Potential habitats for the species are found in upper elevations on the Horseshoe and Sulphur Draw allotments, especially in areas affected by the 1994 Rattlesnake fire, but extensive surveys in 1995-96 and in 2000 did not detect any birds (Conway and Kirkpatrick 2001 and PR 63). Suitable flycatcher habitats are found at upper elevations where livestock do not graze. Livestock are present on the allotments only during the winter, almost entirely outside of the March to September nesting season for flycatchers. Based on this information, the implementation of either of the alternatives is not expected to result in impacts to buff-breasted flycatcher and would not contribute significantly to changes in Forest-wide populations for the species.

Threatened, Endangered, Proposed and Forest Service Sensitive Species

Effects of the ongoing grazing activities on the allotments have been evaluated in Biological Assessments (BA) of Ongoing and Long-term Grazing on the Coronado National Forest and in the associated Biological Opinions from the U.S. Fish and Wildlife Service (PR 29). These assessments were based on management practices in place on the allotments at the time. Based on changes in proposed management, updated information on resource conditions and the need to extend the term of the consultation to coincide with the term of the proposed grazing permits, project level consultation was reinitiated for the proposal in 2007 (PR 75). For species potentially affected by the proposed action or alternatives, effects are disclosed below. More extensive discussions, including "no effect" determinations, can be found in the project BA (PR 75).

Lesser long-nosed bat (LLNB). The species feeds on the nectar and pollen of paniculate agaves (*Agave palmeri*, *A. parryi*, and *A. deserti*) and the nectar, pollen and fruit of columnar cactus. Grazing theoretically affects the LLNB through removal of food plants either as a result of ground-disturbing livestock management activities or herbivory by livestock on agave stalks. Agave stalks are rich in carbohydrates, and as they begin to bolt are particularly palatable to domestic livestock and wildlife. Livestock and wild herbivores feed on young agave stalks, which precludes the plant from flowering and potentially reduces forage resources for LLNB. Although it is known that livestock will feed on agave stalks, it has not been established that grazing by livestock significantly increases herbivory on agaves compared to ungrazed areas, nor has it been demonstrated that agave densities are a limiting factor for LLNB.

No quantitative measurements of agave density or estimates of the extent of livestock herbivory have been made on the allotments. Ocular estimates of the allotments indicate that agaves are distributed throughout the project area, with highest densities in the desert grassland communities at lower elevations. In 2002 the Forest determined that grazing as practiced on the four allotments may adversely affect the LLNB based on the fact that flowering agaves would be exposed to livestock grazing during April at the beginning of the agave bolting season. Take was not assessed and no terms and conditions were issued.

Under Alternative 1, no effects are anticipated as livestock will be removed from the allotments and agaves will not be exposed to grazing. Under the Alternative 2, grazing may occur during a portion of the agave bolting season (April 1-30) in each allotment. Since cattle will be removed by April 30 each year, no exposure is anticipated during the balance of the agave bolting season. In addition, grazing is functionally restricted to lower, flatter sites, leaving approximately three quarters of the area ungrazed. Although grazing on agaves will be limited by the timing and location of grazing, the effects cannot be quantified because intensive monitoring of agave utilization has not been done. Therefore, effects cannot be considered insignificant or discountable. Based on this, the Forest has determined that the proposed action may adversely affect the LLNB because agaves will be exposed to grazing livestock during the bolting season. Mitigation is in place to minimize the destruction of agaves as a result of construction activities and will continue under the proposed action. No roosts are known from the allotments, so no effects to roosts are anticipated.

Jaguar (*Felis onca*). The decline of the jaguar in Arizona was concurrent with predator control activities associated with land settlement and the development of the livestock industry in the early 20th century. Predator control activities aimed at jaguar no longer occur. Activities that potentially affect jaguars are those that result in fragmentation of habitats or disruption of movement corridors that allow dispersal into unoccupied habitats. Dense woody vegetation that provides potential cover is abundant throughout the project area and the species has been recorded from nearby mountain ranges. An adult male jaguar was illegally killed by hunters in the Dos Cabezas Mountains in 1986, and young males have been photographed in the Peloncillo Mountains in 1996 and 2006. Given the relative orientation to historic and recent jaguar observation records and the remote, rugged characteristics of the allotments, all four allotments are considered to have some potential as travel corridors or hunting areas.

Under Alternative 1, livestock would be removed. There would be no effects on woody cover, although herbaceous cover may increase in areas that were historically grazed. Assuming that jaguars opportunistically prey on cattle, some reduction in prey availability may occur. However, native deer are abundant in the project area, so this effect would not be significant. Under Alternative 2 consultations determined that the proposed action may affect, but is not likely to adversely affect jaguar on all four allotments. Based on recent occurrences, a jaguar or jaguars may be reasonably expected to occur in the project area in the next ten years. However, livestock grazing within the project area is not predicted to reduce woody cover in bottoms or uplands. Livestock grazing and facility development may result in short term disturbance, but will not permanently disrupt connectivity corridors within the U.S. and between the U.S. and Mexico. Pasture fences as proposed are not known to present a barrier to jaguar movement. Jaguars may prey on livestock, but such predation has not been documented in the project area. Any effects as a result of authorized grazing are anticipated to be insignificant or discountable.

Mexican Spotted Owl (*Strix occidentalis mexicana*). Protected activity centers (PACs) are found in the Chiricahua Mountains, but none are located within the analysis area (Figure 5). No grazing or livestock-related activities will occur within PACs as a result of the proposed action or alternatives. Upper elevations within the analysis area provide coniferous forest, evergreen and

coniferous riparian vegetation that may be suitable as MSO habitat. These sites are largely inaccessible to livestock, but may receive short duration, low intensity grazing early in the grazing season (November-December). Utilization rates on herbaceous forage are negligible. Suitable habitats are all within the Chiricahua Wilderness and human disturbance or construction activities related to livestock management are not anticipated. Grazing in the four allotments occurs only during the winter (11/1-4/30) and largely in lower elevation woodlands and grasslands outside of suitable MSO habitat. Based on this, the Forest determined that the proposed action *may affect, but is not likely to adversely affect* MSO on the four allotments.

Mexican Spotted Owl Critical Habitat. Small, upper elevation portions of the Sulphur Draw and Horseshoe allotments have been identified as MSO critical habitat (Figure 5). Effects to critical habitat were the subject of informal consultation in 2004, with a determination that ongoing grazing *may affect but is not likely to adversely affect* critical habitat on the Horseshoe allotment (PR 65). Within critical habitat, constituent elements are located in steep upper elevation canyons that are not grazed. The determination has not changed.

Chiricahua Leopard Frog (*Rana chiricahuensis*). Consultation in 2002 determined that ongoing grazing may affect, but is not likely to adversely affect the Chiricahua leopard frog. There are no records for the Chiricahua leopard frog (CLF) on the allotments or any of the watersheds draining the allotments. The CLF appears to be extirpated from the Chiricahua Mountains (Larry Jones, USFS, personal communication). The apparent extirpation of CLF from the mountain range is consistent with the documented range-wide decline of the species over the past decade. A small breeding population may still persist on private land north of the Forest, but the status of this population is unknown. If this population persists, it may serve as a source population for colonization of suitable habitat in the nearby public lands. Suitable and potential aquatic habitats for Chiricahua leopard frog are limited to a few springs and seeps. Neither Horseshoe Canyon nor Sulphur Draw support perennial water flows and stock tanks in the project area go dry in most years. Chiricahua Spring is now dry. Potential improvements in watershed condition may result in the increased persistence of currently ephemeral aquatic habitats in the project area, and there is a remote possibility that CLF may colonize sites in the project area over the long term. For this reason, the Forest has determined that the proposed action may affect, not likely to adversely affect the CLF.

Sensitive Species

Effects to Forest Service Sensitive species are evaluated in the project level biological evaluation (PR 67) and are summarized below.

For the following species, the action alternatives may impact individuals, but is not likely to result in a trend or a loss of viability based on the rationale shown for each species. For the most part, effects will be limited to grazing or trampling on individual plants or minor disturbance of individual animals.

Apache northern goshawk (*Accipiter gentiles apache*). An active Goshawk nest is located in upper Horseshoe Canyon and post-fledging family area (PFA) and foraging area have been identified and mapped (Figure 5). Nesting habitat includes closed-canopied Madrean oak woodland and Mexican pine-oak woodlands. Forest plan standards and guidelines for goshawk call for management that results in uneven age conditions to sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition well distributed across the landscape. Human disturbance during the breeding season (March 1-September 30) should be limited in or near nest sites and PFAs.

Under the proposed action, grazing will occur largely outside of the goshawk breeding season. Grazing in Horseshoe Canyon will occur in higher pastures early in the grazing season; by March, most cattle have drifted down to lower pastures outside of the foraging area. The nest sites and most of the PFA are within the Chiricahua Wilderness and no ground disturbing activities other than livestock grazing are proposed. Some disturbance associated with livestock gathering may occur during the breeding season in April. This disturbance is anticipated to be of short duration (1-2 days) and limited in intensity.

Gould's Turkey (*Meleagris gallopavo mexicana*). Turkeys require trees of sufficient size for roosting, free water, and green feed and insects during the spring and summer breeding season. The species is also listed in the threatened and endangered species MIS indicator group in the Forest Plan. The Chiricahua Mountains have been identified as a reintroduction location and turkeys were released in Turkey Creek in 2003 and 2004. The species has not been documented from the analysis area; however, abundant suitable habitat exists within the project area, especially in upper Horseshoe Canyon. Under current management, herbaceous cover in openings in canyon bottoms is heavily grazed each winter and some sites do not provide adequate turkey habitat in the spring. Higher elevations are lightly grazed and provide adequate year-round cover.

The Southeastern Arizona Turkey Management Plan (PR 68) identifies several strategies for grazing management in current or potential Gould's Turkey habitat. These include:

- Use of herbaceous vegetation should not exceed 50% of annual growth.
- Herbaceous cover in openings of less than 5 acres should exceed 70%, with a minimum height of 10 inches.
- Fence half or more of dirt tank perimeters to allow the growth of herbaceous vegetation.
- Grazing should be timed to retain herbaceous cover during spring (nesting and brood rearing) season.
- Avoid livestock use of steep slopes that are important to nesting hens.

No direct impacts are expected as a result of any of the alternatives; however, indirect impacts to potential habitats may occur. Under the No Action alternative, herbaceous cover throughout suitable habitats would be greatest. In the absence of grazing, openings in the bottom of Horseshoe Canyon and Sulphur Draw would retain year-round cover sufficient to provide habitat for turkeys. Water developments would not be maintained under this alternative, so water distribution may limit turkey populations in dry years. Grazing under the proposed action is expected to reduce utilization levels in potential habitats. Topography and water locations in the bottoms of the major canyons will combine to result in zones of heavy utilization where livestock concentrate, but the size of these areas and intensity of use in these zones should be reduced.

Redflower onion (*Allium rhizomatum*). There are no records from the analysis area, but suitable habitats (grassy mountain slopes, grasslands and moist rocky places) may be present. Consumption and trampling of individual plants may occur under the proposed action; however, topography on the allotments generally limits livestock use to approximately 25% of the total area, so many areas of potentially suitable habitat will not be grazed.

Bartram's stonecrop (*Graptopetalum bartramii*). This perennial succulent is found in cracks in rocky outcrops, along stream bottoms and on steep hillsides at elevations between 3,900 and 6,700 feet in evergreen woodlands. It has been collected in the northern end of the Chiricahua Mountains and suitable habitats may occur in the project area, but it has not been detected. Much

of the potential habitat for the species is inaccessible to livestock and will not be grazed under the proposed action.

Mock pennyroyal (*Hedeoma dentatum*). This plant grows in open road cuts, rock outcrops and steep gravelly slopes with open full sunlight in Madrean woodlands. There are records from just north of the project area and suitable habitats may exist in the project area. Considering the plant's preference for steep slopes and the tendency for livestock to avoid these areas, impacts to the species are expected to be minor.

Lemmon morning glory (*Ipomoea tenuiloba* var. *lemmonii*). This is an herbaceous perennial with a tuberous root found in desert grassland and pine-oak woodlands. There are no records from the project area, but the species occurs on the west base of the Chiricahua Mountains. Some potential habitats may occur in the project area. Grazing under the proposed action will occur on roughly only 25% of the project area, leaving much potential habitat unaffected by grazing.

Chihuahua scurf pea (*Pediomelum pentaphyllum*). Potential habitats in desert grasslands may occur at lower elevations in all allotments, but especially in the Cienega Allotment. It has not been documented from the project area. Grazing and trampling by livestock represent potential impacts, but under the proposed action, grazing intensity is projected to be lower than previous levels.

Coppermine milk-vetch (*Astragalus cobrensis* var. *maguirei*). This species is found in shady canyon bottoms in association with pinyon pine, alligator juniper, mixed oak, Apache and ponderosa pines from 5,500 to over 7,000 feet. The plant is relatively palatable and, since it occurs in canyon bottoms, it is subject to impact by livestock grazing. Recreation in the form of dispersed camping can also impact individuals or populations. There are no records from the project area (all known occurrences for the Chiricahua Mountains are from the west side of the range), but potential habitats may exist.

Branching Penstemon (*Penstemon ramosus*). This perennial deciduous forb grows in rocky mountain canyons between 4,000 and 5,600 feet in disclimax semidesert grasslands and upper Chihuahuan desertscrub. Little is known of the current status of the species' populations. The last known specimens were collected just north of the project area in 1975. Potential habitat occurs on the Cienega Allotment and individual plants might be grazed.

Chiricahua rock daisy (*Perityle cochenensis*). This herbaceous perennial is found in crevices and ledges in rhyolitic cliff faces of canyons within Madrean evergreen woodlands at elevations of 5,500 to 7,000 feet. The species grows in fairly inaccessible habitats and is naturally protected to some degree from the effects of grazing. A population occurs near Maple Camp just north of the project area and suitable habitats are well distributed in the project area.

Superb penstemon (*Penstemon superbus*). This perennial forb grows on alluvial substrates in rocky canyons, dry hillsides and washes between 3,100 and 5,500 feet. Associated plant communities are riparian floodplains, desert grasslands and transition areas between the two. There are no records from the project area, but potential habitat may be present in the bottom of Horseshoe Canyon. Possible impacts include grazing and trampling of individual plants by livestock.

Toumey groundsel (*Senecio neomexicanus* var. *toumeyii*). This herbaceous perennial is found in oak chaparral and sometimes pine-oak forest at elevations of 3,000 to 9,000 feet. There is a record from the south fork of Cave Creek, but no known occurrences from the project area. Potential habitat may occur in the project area, but such habitats are characterized by heavy brush cover and are not well suited for livestock grazing.

Nodding blue-eyed grass (*Sisyrinchium cernuum*). This is a perennial herb with grass-like leaves that grows along streams in partial shade and in canyon bottoms and on sandy stream banks from 3,300 to 8,000 feet in elevation. It occurs in both wet and non-wet sites. No records are known from the project area, but potential habitats may exist. Possible impacts associated with grazing would be limited to the loss of individual plants due to trampling or consumption by livestock.

Thurber hoarypea (*Tephrosia thurberi*). This perennial forb grows on dry, rocky slopes at elevations of 3,500 to 7,000 feet in oak and pine-oak woodlands, junipers, manzanita and semidesert grasslands. The species occurs in east Turkey Creek, six miles northwest of the project area but has not been documented from the area. Potential habitat is found throughout the project area. Potential impacts would involve trampling and browsing by livestock, but because topography and vegetation limit livestock use to approximately 25% of the project area, much of the suitable habitat would not be grazed.

Shade violet (*Viola umbraticola*). This perennial herb grows in shady sites in canyon bottoms at elevations of 5,500 to 7,300 feet in Madrean evergreen woodlands and montane forests. The species is known from Cave Creek, but has not been found in the project area. Suitable habitats are found in the upper reaches of Horseshoe and Sulphur Draw Canyons. Potential threats are trampling and grazing by livestock. Grazing under the proposed action could affect individual plants, but much of the potential habitat for the species will not be grazed because of steep topography and thick vegetation.

Arizona Giant Skipper (*Agathymus aryxna*) and Freeman's agave borer (*Agathymus baueri freemani*). These species occurs throughout the Coronado National Forest in suitable habitats containing its preferred food plant, *Agave palmeri*. Possible effects from livestock grazing include the removal or disturbance of food plants or the trampling of adults in muddy areas where the species congregates. The butterfly and its host plant are widespread in southeastern Arizona and well distributed in the analysis area.

***Amblycheila baroni*.** This is a nocturnal tiger beetle that feeds on a variety of insects and other arthropods. It is found throughout the Coronado National Forest in oak, juniper and mixed grasses at elevations of 3,500 to 5,500 feet. The species is active during the late summer after the onset of summer rains. The species is described as widespread and abundant where it is found. Effects from livestock grazing are limited to accidental trampling of individuals.

Pima orange tip (*Anthocharis pima*). This butterfly is considered to be common and widespread throughout suitable habitats in southern Arizona in Sonoran and Chihuahuan desertscrub, barely into the grassland communities. The species feeds on a variety of mustards. Limited habitats exist within the analysis area for this species. A small area of Chihuahuan desertscrub is mapped in the Cienega allotment, but the site is actually disclimax desert grassland. Nevertheless, because the species uses a broad range of food plants, some habitat may be available in this allotment. Potential effects would be related to grazing on food plants by livestock.

Arizona metalmark (*Calephelis arizonensis*). This species is known year-round from throughout southeastern Arizona where it is found near the bases of the mountains up off of the desert floor and in riparian bottoms where the host plant, *Bidens* sp. (beggarticks), is found. *Bidens* is a plant of riparian affinity and most suitable Apodemia habitats have a source of permanent or semi-permanent water nearby. It is not known whether *Bidens* occurs within the analysis area; permanent water does not occur within any of the drainages. Possible effects to the species would involve removal of the host plant through grazing.

For the following animals and plants, a Forest Service biologist has determined that the proposed action will have no impact based on the rationale shown for each species.

Arizona shrew (*Sorex arizonae*). Arizona shrew habitat includes riparian edges in pine-oak woodland usually in close proximity to surface water. There are no records from the analysis area and because of the lack of surface water in the allotments, habitats are very limited or absent.

Chiricahua (Mexican) fox squirrel (*Sciurus nayaritensis*). The Mexican fox squirrel inhabits mixed pine-oak forests from the Chiricahua Mountains south through the Sierra Madre Occidental in Mexico. It is typically found at elevations from 5,200 to 8,000 feet in dense mixed broadleaf riparian communities, especially where this community is in juxtaposition with montane forest or evergreen woodlands. Suitable habitats are found in upper elevations of the project area; however the lack of significant amounts of broadleaf deciduous trees such as sycamores and walnuts, probably limits the capability of the area as squirrel habitat. Fox squirrels are highly arboreal and are probably not greatly affected by moderate levels of grazing. Livestock grazing as proposed is designed to assure moderate levels of use and provide for tree recruitment. In addition, very little grazing is anticipated in upper elevation canyons that provide the best squirrel habitat.

American peregrine falcon (*Falco peregrinus anatum*). Active peregrine falcon eyries are known from nearby Cave Creek and Portal Peak, adjacent to the analysis area. Observations of falcons have been recorded from the allotments and the area is likely used as a foraging area for birds nesting nearby. The primary threat to the species is disturbance at nest sites, primarily by recreational rock climbers, but also through other ground-disturbing or loud activities that take place during the nesting season (March 1 to July 15). Under the proposed action, grazing will occur during the winter only. No potentially disturbing activities are planned in the vicinity of existing eyries, so no direct impacts to peregrine falcons are anticipated as a result of any of the project alternatives.

Chiricahua rock cress (*Arabis tricornuta*). There are no records from the project area. The species occurs above 6,000 feet at elevations higher than where grazing normally occurs on the allotments. Because of topography and vegetation, little grazing occurs above 5500 feet in the allotments.

Lemmon milkweed (*Asclepias lemmonii*). This species is found in canyons, roadsides and open woodlands within the Madrean evergreen woodland plant community at elevations of 5,500 to 7,000 feet. There is a record from Cave Creek and potential habitat is found at upper elevations of the project area. Livestock grazing in the project area occurs at lower elevations than where the species is found.

Trans-Pecos Indian paintbrush (*Castilleja nervata*). This species is found on rocky slopes with grassy openings in pine-oak woodlands at elevations from 4,200 to 9,600 feet. It is found in tall bunch grass communities. The only occurrence from the Chiricahua EMA is located near Rock Creek, over 10 miles away from the project area.

Arid throne fleabane (*Erigeron arisolius*). This is an annual or short-lived perennial that grows in grasslands and grassy opening in oak woodlands, often in moist soils. It has been collected from the west side of the Chiricahua Mountains, but is not known from the project area.

Chiricahua fleabane (*Erigeron kuschei*). This species occurs in Madrean conifer forest communities on rock outcrops and cliffs. It is found at high elevation (6,800-9,300 feet), moist, shaded sites. Under the proposed action, no grazing is expected to occur at elevations that provide habitat for the species.

Chiricahua Mountain alumroot (*Huechera glomerata*). This herbaceous perennial forb is found on shaded rocky slopes in humus soil, near seeps and streams in riparian areas in pine-oak woodland. It occurs from 4,000 to 9,000 feet. There are no records from the project area and potential habitat is limited to a very few springs and seeps at upper elevations on the allotments.

Rusby's hawkweed (*Hieracium rusbyi*). This perennial herb is found in mixed conifer forest at elevations from 6,000 to 9,000 feet. One record is known for the Chiricahua Mountains near Rustler Park. The elevational range for the species is well above where grazing will occur under the proposed action.

Huachuca mountain lupine (*Lupinus huachucanus*). This is an herbaceous perennial forb found in pine forests on moderate to steep slopes, often in canyon bottoms and along roadsides from 5,000 to 6,000 feet. The species was last documented in the Chiricahua Mountains in 1894. Potentially suitable habitats for the species are in higher and steeper terrain than where livestock are expected to graze.

Lemmon's lupine (*Lupinus lemmonii*). This is an herbaceous perennial forb that occurs in pine forests, woodlands and desert grasslands on sandy ridges from 4,000 to 7,000 feet. A single occurrence is recorded from private land west of the Chiricahua Mountains. Potentially suitable habitats are found in the project area, but the project area is over 15 miles from the closest known occurrence.

Davis Mountain Jacob's ladder (*Polemonium pauciflorum*). This perennial herb occurs in the Chiricahua Mountains above 6,800 feet elevation. It is commonly found in areas where there has been some sort of disturbance. Under the proposed action, no grazing or other livestock management activities will occur in habitats where the species potentially occurs.

Chiricahua Mountains brookweed (*Samolus vagans*). This perennial herb is confined to areas of permanent water such as springs, seeps and streams at elevations from 4,000 to 7,200 feet in Madrean evergreen woodlands and coniferous forests. Suitable sites do not occur in the project area.

Huachuca groundsel (*Senecio huachucanus*). This species occurs in Madrean conifer forest and the upper margins of the Madrean evergreen woodland communities at elevations between 7,000 and 9,500 feet. One population is known from the Chiricahua Mountains near Chiricahua Peak. Under the proposed action, no grazing or other livestock management activities will occur at elevations where the species potentially occurs.

Crescent metalmark (*Apodemia phycioides*). This species is known only from two specimens collected before 1924 in the Chiricahua Mountains. In the Sierra Madre of northern Mexico, it is found in riparian areas with steep cliffs. Based on the lack of recent observations of the species in the Chiricahua Mountains, no impacts are expected.

Chiricahua water scavenger beetle (*Cymbiodyta arizonica*). This is an aquatic beetle found only in the Chiricahua Mountains. No suitable aquatic habitats are known from the analysis area.

Scudder's duskywing (*Erynnis scudderi*). This butterfly occurs throughout southeastern Arizona in higher elevation oak woodlands. Adults are rarely found below 6,500 feet in elevation. The known range and preferred microhabitats for the species are generally too high and remote to be affected by livestock grazing under the proposed action.

Ursine giant skipper (*Megathymus ursus*). The species is recorded from most mountain ranges in southeastern Arizona at elevations between 3,900 and 8,400 feet. It is most common at the lower edge of the oak woodland and also in desert grassland where populations of its host plant,

Yucca spp. are found. Adults are active during July and August. Few if any yuccas are found in the analysis area, so habitat for the skipper is limited.

Clytie hairstreak (*Ministrymon clytie*). There is some question as to whether this species occurs in Arizona. The only modern record is from Madera Canyon in 1966, and misidentification of the specimen is suspected.

Chiricahua pine white (*Neophasia terlooii*). This butterfly species is reported to use ponderosa pine and Engelman spruce. Larvae eat the leaves. Colonies are always in pine forests, usually above 6,200 feet. Within the analysis area, these habitats occur in limited areas and are not grazed by livestock.

Spotted skipperling (*Piruna polingii*). This species inhabits cool deep canyons in the Huachuca and Chiricahua Mountains. The flight period extends from late July into mid-September. Sites within the analysis area are generally too low and dry for this species and the few higher elevation sites that may provide habitat are not subject to grazing under the proposed action.

Environmental Effects: Other Wildlife Species of Concern

Gambel's Quail (*Callipepla gambelii*). Optimal habitats are shrubby deserts, often dominated by low mesquite. The species is commonly encountered on the Cienega allotment, but suitable habitats are limited elsewhere in the analysis area. Gambel's quail populations are highly correlated to winter precipitation and its effect on the availability of succulent green forbs in the spring. No significant difference in impacts to Gambel's quail are expected under either of the alternatives.

Mule deer (*Odocoileus hemionus*). Mule deer are resident around the base of the Chiricahua Mountains where the woodlands give way to the desert grasslands. Little of the analysis area is considered suitable for mule deer, although they occur in moderate numbers at the lowest elevations of the area. Livestock grazing may effect mule deer populations through direct competition for forage or removal of fawning cover. No mule deer have been seen during field trips to the area, but observations have been recorded in allotment inspection reports in the project file. Because suitable habitats are limited within the project area, occurring primarily at low elevations on the Forest boundary, neither of the alternatives is expected to result in significant effects to mule deer.

Javelina (*Tyassu tajacu*). Javelina are found in the desert grassland, oak woodland and evergreen riparian plant communities in the Chiricahua Mountains, including the analysis area. They consume a variety of food items, but cacti and other succulent plants constitute the bulk of their diet. In chaparral and oak woodland habitats, mast in the form of manzanita berries and acorns is a significant portion of the diet. There is little data available on the effects of grazing on javelina, although historic heavy grazing in the southwest has been suggested as contributing to the northward expansion of javelina populations over the past 200 years, mainly through the conversion of grassland to scrub. No discernable differences in effects are anticipated as a result of implementation of either of the alternatives.

Cottontail rabbit (*Sylvilagus floridanus* and *S. audubonii*). Two species of cottontail occur in the vicinity of the Chiricahua Mountains, the Eastern cottontail (*S. floridanus*) and the Desert cottontail (*S. audubonii*). Cottontails use a wide range of habitats at different elevations and successional stages. In general, good cottontail habitat will be a grassland-type community interspersed with escape cover in the form of woody debris or low shrubs and an abundance of forbs for food. This type of habitat is present in the analysis area in the desert scrub, desert grassland and evergreen woodland communities. Most suitable cottontail habitats are on steeper

slopes where livestock do not graze. No discernable differences in effects are anticipated as a result of implementation of any of the alternatives and none of the alternatives are projected to result in significant changes in occupied habitats for the species.

Raptors: Effects to peregrine falcon, goshawk and Mexican spotted owl are analyzed in detail in the BAE and the MIS report for the project. No discernable differences in effects are anticipated as a result of implementation of any of the alternatives and none of the alternatives are projected to result in significant changes in occupied habitats for the species.

Neotropical Migratory Birds and Important Bird Areas. Executive Order 13186, of January 10, 2001 directs Federal agencies to support migratory bird conservation and to “ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern”. Birds of Conservation Concern are identified by the U.S. Fish and Wildlife Service by Bird Conservation Region 11. The Project area lies within the Sierra Madre Occidental Region. Thirty-nine birds of conservation concern are identified for this region. Under all alternatives, effects to migratory birds are anticipated to be positive or insignificant as a result of projected improvements in riparian habitats and herbaceous cover.

The Chiricahua Mountains are officially identified by the National Audubon Society as an Important Bird Area. The continued authorization of livestock grazing within the analysis area is not expected to affect this designation.

Vegetation Condition

Grazing by domestic livestock may impact vegetation by changing the mix of species in the plant community being grazed (vegetation composition), by changing the density and frequency of perennial forage plants, and by changing the vigor of the grazed plants. Rangeland condition is an expression of the degree to which the composition, frequency and vigor of plants in a community resemble the climax plant community for that site. Measurements of these three vegetation parameters are used to place range sites into four vegetation condition classes that reflect the relative effects of grazing on vegetation.

The project area falls within the Mexican Oak – Pine Woodland and Oak Savannah land resource unit (41-1 AZ) as defined by the Natural Resource Conservation Service. The reference range sites used to describe the potential natural community for the purpose of determining rangeland condition include sandyloam uplands in the 16-20 inch precipitation zone (PZ) and 20-23” PZ, volcanic hills, loamy hills, loamy upland and sandy bottom, all in the 16-20” PZ (PR 36).

Rangeland vegetation was assessed by visual estimate on the four allotments in 1998 and updated by field visits between 1999 and 2001 (Table 5). Moderately low ratings result from observations of shrub encroachment, low plant cover, low plant vigor and, on the Horseshoe Allotment, the occurrence of Lehmann lovegrass in the lower portions of the allotment. In general, low range conditions occur in flatter areas where livestock have historically concentrated. Additional information was obtained by a production and utilization study completed for the Horseshoe Allotment in 1985 and 1986 (PRs 2, 3), and one for the Sulphur Draw, Sanford and Cienega Allotments completed in 1995 and 1996 (PR 4). Apparent trend is reported, although trend is difficult to assess in the absence of plant community analysis over consecutive years, which has not been done in the analysis area. The trend is rated as mostly upward because comparison with historic condition shows that there has been considerable improvement over the past twenty years.

Comment [rag1]: There are no supporting documents in the project record. Unless we can find something, we will need to substitute the paragraph found following.

¹¹ USFWS 2002. Birds of Conservation Concern. Div. of Migratory Bird Management.

Table 5. Vegetation condition and trend on capable range: Horseshoe, Sulphur Draw, Sanford and Cienega allotments.

	Percent Moderately High			Percent Moderately Low		
	Upward	Static	Downward	Upward	Static	Downward
Horseshoe		8		73	19	
Sulphur Draw				85	15	
Sanford		20		80		
Cienega		50		50		

Rangeland condition can be influenced by environmental processes other than grazing. The presence of non-native species will lower condition ratings. The most prevalent non-native plant found within the allotments is Lehmann lovegrass. This grass was probably seeded somewhere in the area for watershed protection purposes in the period of 1960 to 1980, although no records of specific projects were found. A regular regime of fire will favor an open grassland aspect and generally improve rangeland vegetation condition ratings. Fire has not been a regular process in the project area over the past 100 years. Finally, variations in annual precipitation may exacerbate or enhance changes in plant community dynamics brought about through disturbance or rest.

Affected Environment

Rangeland vegetation condition on the Horseshoe Allotment was found to be moderately low throughout most of the capable rangeland. The primary reasons for the moderately low rating in this pasture are low plant cover, and the occurrence of Lehmann lovegrass in lower elevations. The major problem area is the Middle Pasture where cattle have historically concentrated. Higher elevation capable areas are also rated in moderately low condition. These areas are generally lightly used by cattle, with the exception of the area near Red Hill tank. However there is a general predominance of shrubby species and conditions will probably not improve significantly without fire.

Vegetation condition on the Sulphur Draw Allotment is rated as moderately low with a static trend in the lower elevation desert grassland vegetation type along the Forest Boundary. The rating is primarily affected by the presence of Lehmann's lovegrass and low plant vigor. At slopes greater than 15% the vegetation composition, plant vigor and production of grasses was better than in flatter areas. These areas are rated as moderately low condition with an upward trend. Because of steep slopes and heavy cover, cattle use is confined to the desert grassland and the bottom of Sulphur Draw near the only permanent source of water.

Rangeland vegetation condition on the Sanford Allotment was found to be moderately high with a static trend in the desert grassland type, and moderately low with an upward trend in the broadleaf woodland vegetation type. The moderately low rating was indicated by the predominance of shrubby species. This is a small allotment with no water used in conjunction with adjacent private land. Use tends to be light because of the absence of permanent water on the allotment.

Rangeland vegetation condition on the Cienega Allotment was found to be moderately high with a static trend in most of the southwestern desert scrub vegetation type, with some flatter areas along the Forest Boundary in moderately low condition with an upward trend. The moderately low condition was indicated by low production and shrub encroachment. The broadleaf woodland vegetation type is in moderately low rangeland vegetation condition with an upward trend. The moderately low rating in the broadleaf woodland was indicated by the predominance of shrubby species.

Acres that are in areas not capable for grazing are mostly in moderately low condition with an upward trend. These areas consist of steep slopes and/or are very brushy and are minimally affected by grazing, but could be improved with the increased fire frequency. Non-capable acres will not be affected by any of the alternatives.

Environmental Effects

Alternative 1, (No Action/No Grazing) would allow for vegetation recovery in low condition areas. Because a shift in species composition is needed for some areas to reach moderately high condition, some areas will probably remain in moderately low condition for the duration of the analysis period. This is particularly true in areas where the presence of Lehmann lovegrass contributes to low range condition. Other parameters of range condition such as plant vigor and density are expected to improve more rapidly. This would result in increased accumulation of residual plant material, both standing and in the form of litter. Additional organic material is expected to provide soil protection, increase soil water holding capacity and decrease evaporation. In terms of indirect effects, additional herbaceous material in the understory will provide fine fuels that will allow fire to play a more natural role in the area. The re-establishment of a more natural fire regime is expected to reduce the density of woody species such as mesquite and turpentine bush that have invaded the grassy bottoms.

Alternative 2 (Proposed Action) will reduce stocking and provide flexibility to adjust to changing forage conditions. Proposed utilization limits of 45% in uplands and 35% in wilderness should result in increasing plant density and improved vigor over the term of the analysis. Because of limited water distribution in some years and the tendency of cattle to concentrate in canyon bottoms, management will be necessary to assure more even forage utilization. Provided management and monitoring are sufficient to achieve proper distribution, Alternative 3 should result in the attainment of desired condition.

Riparian Condition

Affected Environment

Perennial streams and wetlands do not occur in the project area. Stream channels within the project area have flowing water only after rains or intermittently for short durations. In some areas, subsurface flow is present and sustains small areas of riparian vegetation. Horseshoe Canyon and Sulphur Draw Canyon contain a mix of evergreen riparian vegetation (Emory and other oak species and alligator juniper) and coniferous riparian vegetation (Chiricahua pine and Douglas fir). Deciduous riparian species (e.g. cottonwood, willow, sycamore and ash) are found in small numbers at lower elevations but the drainages are not considered to have the potential to develop a stand dominated by deciduous riparian trees (PRs 24, 56). The Cienega allotment is likely named for a cienega or artesian spring that historically was found on the Forest Boundary in the northeast corner of the allotment. The spring is now dry, but it supports a stand of deciduous riparian trees.

The analysis of riparian area condition is based primarily on information gathered at established riparian area monitoring points. These areas were all assessed in 1998 for condition and to verify the accuracy of the vegetation classification (PR 24, 56). Stream channels are generally meeting the standards of the Forest Plan. (PR 56). Recruitment of riparian vegetation is good and vigor is fair to good.

Environmental Effects

Livestock grazing may impact riparian area condition by compacting the soil surface (hydrologic function); by removing plant material (stability); by changing the mix of species in the plant community being grazed (vegetation composition); by changing the density and frequency of perennial forage plants (forage frequency); and by changing the vigor of the grazed plants.

Alternative 1 (No Action/No Grazing) will have no impacts from grazing. The proposed action will allow for summer growing season recovery each year. Winter-only use is preferable to growing season use for increasing bank protection by grass species. Conservative allowable use levels are expected to leave sufficient residual biomass to protect stream channels. In addition, the proposed action will provide protection to riparian resources at Cienega Spring by fencing off the spring site. In Horseshoe Canyon, significant development of deciduous riparian vegetation is unlikely under either alternative due to the lack of surface water.

Wilderness

Affected Environment

Approximately 17,500 acres of the analysis area are contained in the Chiricahua Wilderness. For the most part, the wilderness area contains acres considered not capable for grazing and very little livestock use occurs within the wilderness on the Horseshoe and Sulphur Draw Allotments. On the Cienega Allotment, roughly one half of the capable acres are located within the Wilderness. Nearly all of the Sanford allotment is wilderness. Forest Plan direction limits livestock utilization within wilderness to 35%. Under current management, annual utilization exceeds 35% on the Cienega allotment in some years.

Environmental Effects

Grazing effects to wilderness resources will be confined to the Cienega and Sanford allotments. Topography and vegetation limit use in other allotments to non-wilderness sites. However, the lack of available water limits use to the fringe of the wilderness area. Under the proposed action, moderate stocking and active utilization monitoring would be expected to keep use within established limits. If problems are identified, management will be changed to reduce use to acceptable levels.

Soils and Watershed

Affected Environment

The geology underlying the project area is typically rhyolitic tuff, lava flows and intrusive rhyolitic rock in the uplands. In general, soils are cobbly sandy loams with numerous rock outcrops. Deeper soils are found in flatter terrain at the bases of mountains and in drainage bottoms. Slopes over 40% tend to have shallow soils. Soil condition on the allotments was assessed in 1999 (PR 23) and in 2006 (PR 58, Table 6) following the methods outlined in FSM 2309.18 Soil Management, R-3 Supplement No. 2509.18-99-1. Field observations indicate that several areas in capable rangelands in these allotments display surface soil characteristics indicating impairment (visible sheet and rill erosion, soil deposition behind barriers such as plants and rocks, vegetative plant communities that represent a drier less productive site, lack of vegetative ground cover, and poor root distribution). The areas of soil impairment are mostly in flatter areas that were historically overused. Soil texture and depth have not been modified, so no

unsatisfactory soils were identified. Soils in non-capable areas are rated as satisfactory by definition, because they have been minimally affected by management activity.

Table 6. Soil condition of capable acres by allotment.

Allotment	Capable Acres	Satisfactory		Impaired		Unsatisfactory	
		Acres	Percent	Acres	Percent	Acres	Percent
Horseshoe	2883	1761	61%	1122	39%	0	0%
Sulphur Draw	1342	1040	77%	302	23%	0	0%
Sanford	488	488	100%	0	0%	0	0%
Cienega	1117	1014	91%	103	9%	0	0%

Environmental Effects

Livestock grazing may impact soil function by compacting the soil surface (hydrologic function), removing plant material (stability), or changing the plant community composition (nutrient cycling). Information about slope, vegetation community and rangeland condition was also used as a basis for ratings.

Alternative 1 will lead to improved soil quality at a faster rate than the proposed action in some areas, specifically cattle bed grounds and around water sources where cattle tend to concentrate. Over time soil bulk density and structure would return to natural levels, but changes would be slow. Alternative 2 will lead to improvement, provided timely monitoring and management actions occur. Because it will allow more flexibility in herd management, the permittee will have more planning options for proper stocking in anticipation of forage conditions. This should result in fewer incidents of overuse, therefore more litter left on the ground and more roots in the soil profile. Erosion will be controlled through implementation of Best Management Practices. Effects to soils from the proposed action and alternatives are local. Although there is some evidence of soil movement within the project area, there is no evidence that measurable amounts of soil or water will move off-site as a result of the proposed action as compared with natural amounts.

Air Quality

Affected Environment

The Clean Air Act established air quality standards for various classes of airsheds. Class I airsheds include National Parks and Wilderness areas. Class II airsheds are generally rural areas. The Forest Plan Standards and Guidelines for air resources specify "All management practices will be planned so that air quality will meet local, State and Federal standards." The project area includes both Class I and Class II air sheds. Air quality in and around the area is high due to the relative isolation from urban centers, limited access, good vegetative ground cover, and the large scale of the analysis area. None of the project area is within a non-attainment area. Currently, the air quality in the project area is within the standards and guidelines of the Forest Plan.

Environmental Effects

Activities resulting from this project will not significantly affect the factors contributing to a high quality air shed. None of the alternatives would negatively affect air quality. No direct or indirect effects would occur to air quality from this project. Because there will be no direct or indirect effects, no cumulative effects will occur.

Water Quality and Quantity

Affected Environment

The Horseshoe allotment lies within the San Simon River Headwaters 5th Code Watershed. This watershed is 214,000 acres in size, and the allotment comprises just under 9% of the watershed. The town of Rodeo is within this watershed. Land uses on private land are those associated with agriculture and rural development. Uses on Federal and State lands are primarily grazing and recreation. The Sanford, Sulphur Draw and Cienega allotments lie within the Cave Creek-San Simon River 5th Code Watershed and comprise 6% of the watershed.

Water quality is assessed by comparing existing conditions with desired conditions that are set by the states under the authority of the Clean Water Act. The Arizona Department of Environmental Quality (ADEQ) is the regulating authority for water quality in Arizona. San Simon Creek was reported in the 2000 ADEQ 305(b) Report to be fully supporting of all uses. This means that the project area is contributing to a high quality system.

Total surface water yield (water quantity) is controlled by annual precipitation and by vegetation type and density on the watershed. The average annual precipitation at the north end of the project area at Portal is 20.95 inches (Western Regional Climate Center <http://www.wrcc.dri.edu/index.html>). There are no surface water flow gauging stations in the vicinity of the project area.

Environmental Effects

Water Quality. Under Alternative 1, adequate diversity and vegetation groundcover (VGC) would contribute to maintaining a satisfactory hydrological function and runoff would continue to be satisfactory. In the impaired soil condition areas, the potential increase of VGC and elimination of livestock-caused soil compaction would contribute to an incremental improvement in hydrological function resulting in less runoff, better infiltration and an improvement in water quality. Water quality would improve due to less sediment moving in the system and less turbidity. Under Alternative 2, areas of impaired soils would continue to contribute small amounts of sediment downstream and surface runoff would be expected to be slightly greater, relative to no grazing, due to poor VGC in some areas. Under the proposed action, the potential increase of VGC and slight reduction in compaction would contribute to an incremental improvement in hydrological function resulting in less peak runoff. However, the changes would not be measurable. Allowable use levels of 30-45% are expected to provide sufficient residual biomass to protect upland areas and drainage systems over time.

Water Quantity. There will be no change in water quantity as a result of implementing either alternative. Water diverted for or consumed by cattle on the allotments accounts for well less than 1% of total water yield in the project area (PR 70). No new diversions or wells are proposed. New water sources will originate from existing storage facilities. Water flow would continue to be controlled using Best Management Practices (BMPs).

Heritage Resources

Affected Environment

Heritage resources (also called “cultural resources”) include archaeological and historical sites, and properties important to maintaining the traditional beliefs and lifeways of local social groups (“traditional cultural properties”). The Chiricahua Ecosystem Management Area (EMA) has a

long history. Prehistoric occupation of the lower elevations of the Chiricahuas and the adjacent valleys was quite intensive, although relatively few sites have been reported within the Forest. Evidence of the Archaic, Mogollon and Salado archaeological cultures is present, and the Cave Creek site adjacent to the Cienega Allotment is the type site for the Chiricahua stage of the Archaic. Other sites present on or near the allotments appear to be temporary or special use sites related to the major valley occupations.

Historically, the EMA was within Chiricahua Apache territory. Although there has been some mining in the Chiricahuas, the principal economic activities have been subsistence farming, stock raising, logging and recreation. Today, archaeological and historical sites in the area are of interest to the Hopi Tribe, Pueblo of Zuni, Western Apache (primarily San Carlos Apache and White Mountain Apache), Chiricahua Apache (Fort Sill Chiricahua and Mescalero Apache), Tohono O'odham, and the descendants of nineteenth-century settlers.

Environmental Effects

Concentration of livestock on archaeological and historical sites can result in damage to artifacts and structures, and alteration of the spatial relationships between artifacts. The latter impact can compromise the ability of the remains to provide historical information. Concentration of livestock generally occurs around range improvements. A review of existing information pertaining to the allotments was conducted, and proposed improvements were surveyed. Two sites have been identified as potentially being affected by current management. These sites are identified for protection under the proposed action (see p. 13). Management practices that are part of the proposed action will insure that sites are surveyed and protected during project implementation.

The Cultural Preservation Office of the Hopi Tribe inquired how the allotments would be managed to avoid impacts to native plants, such as tobacco. The Tribe also pointed out the need for intensive traditional cultural property studies and ethnohistorical research, in order to fully identify Hopi interests and needs. Survey and grazing impacts on archaeological sites are summarized above. Since there are no plant inventories for the allotments, there are insufficient data to arrive at a definitive statement of impacts on ethnobotanical plants. While it might be expected that No Action/No Grazing (Alternative 1) would be most beneficial to the growth of plants of interest to the Hopi, this is not necessarily the case. For example, tobacco is a disturbance species on local rangelands and would be favored by grazing levels that could be detrimental to other native plants.

A Heritage Resources Report was prepared by the forest archeologist with a finding of no adverse effect to cultural resources.

Economics

Affected Environment

The allotments are located in Cochise County, Arizona. Tourism and financial services are a growing segment of the economy. Farm and ranch employment is considered an important segment of the economy, but total farm employment accounted for 3.3% of the economy in 2000¹². Ranching operations in the area tend to be characterized by small profit margins with the need for off-ranch supplemental income to continue operations.

¹² Source: Socioeconomic Assessment of the Coronado National Forest, Final Report, 2005.

Decisions relative to livestock grazing on individual allotments can potentially affect the following segments: 1) permittees, who pay grazing fees and receive economic returns on their investments in livestock grazing and who contribute funds for the construction of range improvements; 2) the Forest Service, which collects grazing fees and expends grazing receipts and appropriated tax dollars to construct improvements and to administer the allotments; and 3) counties, which receive 25% of the grazing fees collected by the federal government and benefit from goods and services purchased by ranch operators. The economic considerations of the proposed action and alternatives can be compared in terms of the costs of implementation, the costs and revenues to the permittees and the return to the Federal and local government through grazing permit receipts. Costs and benefits are incurred by both public and private entities (Federal and State governments, counties, permittees) and not all participants recover their costs.

Environmental Effects

Costs of Improvements. Table 7 summarizes costs by allotment associated with implementation of the proposed action. Range improvement costs are based on data provided by District personnel. The projects identified are considered beneficial for optimizing management flexibility and improving livestock distribution. However, using the adaptive management strategy described under the proposed action, monitoring may indicate that the projects are not necessary to achieve desired conditions. In that case, the project would not be implemented.

Table 7. Estimated costs of improvements, Alternative 2 (proposed action).

Allotment	Proposed improvement	Forest Service Cost	Permittee Contribution
Horseshoe	Construct a drift fence across the mouth of Pothole Canyon in the north half of Section 14, T19S, R31E to keep cattle out of the bottom of Horseshoe Canyon.	\$1,000 materials and labor	
Horseshoe	Extend a pipeline from an existing source in the bottom of Horseshoe Canyon .25 mile up Pothole Canyon to a drinker in the south half of Section 11, T19S, R31E.	\$4,200 materials	Labor and equipment
Horseshoe	Line Licklog Dam in upper Horseshoe Canyon (T19S, R31E, Section 18, SE ¼) and fence the water to control access.	\$5,000 materials	Labor
Horseshoe	Extend a pipeline from Warner Well west into the upper portion of Middle pasture (T19S, R31E, Section 22, NW ¼).	\$3,000 materials	Labor and equipment

Alternative 1 would have the lowest cost as no new improvements would be authorized and only limited maintenance would occur. There would, however, still be costs associated with management of the allotments. Maintenance of improvements is typically the responsibility of the permittee. In the absence of a permittee, maintenance or removal of existing structural improvements may become necessary and costs would be borne by the Forest Service. Allotment boundary fence maintenance would be shifted from the permittees to the Forest Service or adjacent permittees. Under Alternative 2, the costs of full implementation are estimated to exceed \$13,000. Forest Service funding levels may require these projects to be phased in over a number of years, unless permittees are willing to bear an additional share of the costs.

Revenue. Net ranch income represents gross returns minus operating costs. All four allotments are held by the same permittee. Specific operating costs and revenue estimates are not available for the ranch, and weather, market conditions and management decisions will affect net revenue on an annual basis. However, various economic studies have calculated a net return of \$60-\$100 per animal unit per year for ranches in Arizona (Gao 1996 reported in Ruyle, et al 2000 (PR 77). Using this range of estimates, annual return on the allotments would be below \$16,000 under the proposed action. However, this figure may not be reflective of total ranch income because the ranch includes non-forest acreage that is available for grazing. Estimates of ranch living expenses cited by Ruyle (PR 77) vary from \$11,500 to over \$20,000 depending on the size of the ranch, so it is likely that the permittee will be dependant on outside sources on income in order to cover living expenses. This is not uncommon; on average Arizona ranches derive about half of their income from outside (non-ranching) sources. The permittees have maintained their operations for several years and have not indicated that management is not economically viable.

Payments to Governments. Annual grazing receipts to the Forest Service would vary from zero under No Action to approximately \$2,500 under maximum allowable use on all allotments under Alternative 2¹³. Of this, twenty five percent would go to Cochise County. The remaining 75% of fees (an estimated \$15,000-\$20,000 over the ten year term of the permits) are returned to the Forest Service. Under the No Action alternative, the county would lose grazing fee payments and ranch revenue that could have been used to purchase goods and services. However, given the economic diversity of the county and the relatively small contribution that these receipts make, the magnitude of this loss would be negligible on the overall county economic health.

Contributions to the Local Economy. Money generated within a community by permittees purchasing goods and services continues to circulate and accounts for indirect contributions to the local economy. Regional data are not available, but a 1995 survey of permittees on the Apache-Sitgreaves National Forest estimated that permittees spent on average \$117 per animal unit year in the regional community (Cosgrove 1995 cited in PR 79). Adjusted for inflation this contribution would be \$187 in 2007 dollars. Because money continues to circulate, a multiplier of 3 was used to estimate total indirect and induced impacts to the local economy. Based on this the four allotments indirectly support 6.2 jobs. Relative to total county employment of 55,000 jobs (PR 59) this contribution is not significant.

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

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898 (February 11, 1994) directed all Federal agencies to evaluate their proposed actions to determine the potential for disproportionate adverse impacts to minority and low-income populations. In the memorandum to heads of departments and agencies that accompanied the Executive Order, the President specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice concerns. The memorandum states that “each Federal agency

¹³ Estimates based on the 2007 grazing fee of \$1.35/AM. Actual receipts would vary somewhat based on changes in the grazing fee.

shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by [NEPA].”

The project area is located in rural Cochise County. The area is sparsely populated, primarily by ranchers and a few owners of private parcels adjacent to Forest Service lands. Selection of any of the alternatives would not result in adverse or disproportionate effects on low income or minority populations. The alternatives, including no grazing, are consistent with activities that have been implemented throughout the Coronado National Forest over many years. As such, the effects are predictable. There would be no displacement of minorities or increases in taxes or fees that would constitute an economic hardship to minorities under any of the alternatives. There would be no effects to public health. Therefore, disproportionate direct, indirect or cumulative adverse impacts on low income or minority populations would not occur.

Cumulative Effects

Cumulative effects are the past, present and reasonably foreseeable future actions that add to the direct and indirect effects considered in this EA. The following activities have been identified as potentially contributing to the effects analyzed herein. These activities and occurrences have contributed incrementally to changes in ecological conditions in the project area and may continue to influence conditions in the project area over the term of the project. Foreseeable future actions are those for which a proposed action has been approved or those proposed for NEPA analysis in the future. Other possible future actions are considered too speculative to include in this analysis. Because no significant direct or indirect effects of the proposed action and alternative are anticipated, neither of the alternatives is expected to contribute significant cumulative effects.

Historic Grazing. Livestock grazing has occurred within the analysis area for over 100 years. In the late 1800s, widespread unregulated grazing resulted in erosion, heavy surface runoff, flooding and down-cutting of streams throughout the southwest. Livestock consumption of herbaceous fine fuels, combined with active fire suppression beginning in the early 1900's has likely contributed to a decreased fire frequency and subsequent invasion of many grasslands by woody plants. The effects of these activities and events are still evident in the project area. The proposed action is designed to correct the effects of historic management, but these effects will likely continue to influence resource conditions, especially soil condition, for the foreseeable future.

Livestock grazing on State and private land adjacent to the project area is expected to continue. Rangelands adjacent to the Forest have been degraded by past grazing and a definite fence line effect is evident at the forest boundary. These areas are downslope from the project area and are unlikely to significantly affect watershed conditions in the project area.

Invasive Species. Non-native invasive plant species occurrences are limited to the presence of Lehman lovegrass. This species was actively seeded in the mid 1900's and is now widespread throughout lower elevations in the project area. The persistence of this species will likely suppress ecological condition in some sites, regardless of management. Grazing under the proposed action is not expected to preclude projects designed to eliminate invasive plants. Cattle can contribute to the distribution of invasive plant seeds and can disturb soils, thereby creating conditions conducive to the growth of invasive plants. However, except for Lehmann lovegrass, invasive plant infestations in the project are not known to occur. The potential presence of invasive plant species off of the Forest may serve as a source of weed seeds that are transported by wind or livestock on to the allotments. Monitoring of rangeland by the Forest Service and the permittee will lead to early identification of invasive exotic plant populations.

Human Activities. Authorized activities in the project area include hiking, hunting, bird watching and vehicle use on unsurfaced roads. Impacts from these activities are short term and primarily consist of minor ground disturbance in popular camping areas. There are no developed campgrounds, nor are there plans for future development. There are several trails in the allotments and a few miles of road in the Horseshoe and Sulphur Draw Allotments. Cattle use on these roads and trails should not lead to adverse cumulative effects.

Portions of the area show substantial evidence of trailing by undocumented aliens and/or drug traffickers. The effects of these activities include accumulations of trash, creation of wildcat foot and vehicle trails and vandalism of range improvements, especially fences. In addition, the area has seen a substantial but unquantified increase in vehicle traffic related to interdiction efforts on the part of the U.S. Border Patrol and other enforcement agencies. These activities result in localized disturbance within the project area, but the proposed action is not expected to contribute adversely to the existing level of effects resulting from these activities. Smuggling may have an impact on the permittees' ability to control livestock distribution and use. The effects of border crossing activities are largely outside of the control of the Forest Service and the permittees, but they are likely to require additional efforts to maintain improvements and keep to a rotation schedule.

Rural and urban development on private lands adjacent to the Forest in the project area has resulted and will continue to result in the loss or fragmentation of wildlife habitats. Movement corridors between mountain ranges have been disrupted or reduced as a result of off-Forest developments. The proposed action and alternatives are not expected to contribute cumulatively to habitat fragmentation since no developments are planned.

There are several management related actions that can contribute to the effects of fire. Fire ignitions by lightning may not spread because of lack of fine fuel (grasses) due to utilization by livestock, and fires may be suppressed as part of the fire management strategy. There were 12 fires in the project area between 1985 and 1999, all caused by lightning. All but three were suppressed. All were small (less than ten acres) except for four. The Sulphur Fire burned 70 acres within the Sulphur Draw Allotment along the Forest Boundary in 1990. The Hole Fire burned 95 acres in Horseshoe Canyon in 1994, and the Horseshoe Fire burned 330 acres Horseshoe Canyon in 1989. In July 2002, the Darnell Fire burned 5,220 acres on the Forest in the northeast portion of the Horseshoe Allotment and the southeast portion of Sulphur Draw.

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:

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Federal and State Officials and Agencies

Arizona Game and Fish Department
Arizona Department of Agriculture
Arizona Department of Environmental Quality
Arizona Cooperative Extension Service
Arizona State Land Department
USDA Natural Resource Conservation Service
USDI Fish and Wildlife Service

Tribes

Fort Sill Apache Tribe	Hopi Tribe
Mescalero Apache Tribe	Pueblo of Zuni
San Carlos Apache Tribe	Tohono O'odham Nation
White Mountain Apache Tribe	Yavapai Apache Nation

Others

National Wild Turkey Federation	Sky Island Alliance
Chiricahua-Dragoon Conservation Alliance	The Center for Biological Diversity
Forest Guardians	Arizona People for the USA
The Rewilding Institute	

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