



United States
Department of
Agriculture

Forest
Service

April 2008



Environmental Assessment

Jackwood and Price Canyon Grazing Allotments Analysis

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Cochise County, Arizona

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CHAPTER 1 – PURPOSE AND NEED

Background

This Environmental Assessment (EA) describes a Forest Service proposal to authorize grazing on the Jackwood and Price Canyon 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). Supporting documentation is on file in the project planning record in the Coronado National Forest Supervisor's Office in Tucson, Arizona. 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.

Purpose and Need for Action

Where consistent with other multiple use goals and objectives, there is congressional intent to allow grazing on suitable lands. (*Multiple Use and Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Management and Policy Act of 1976, National Forest Management Act of 1976*). By regulation, forage-producing lands will be managed for livestock grazing where consistent with land management plans (*36 CFR 222.2(c)*). Where consistent with the goals and objectives of Land and Resource Management Plans, it is Forest Service policy to make forage from lands suitable for grazing available to qualified livestock operators (*FSM 2202.1, FSM 2203.1*). Federal actions such as authorization of grazing and approval of allotment management plans must be analyzed to determine potential environmental consequences (*National Environmental Policy Act (NEPA) of 1969; Rescission Act of 1995, P.L. 104*).

The Jackwood and Price Canyon allotments include land identified as suitable for grazing in the Coronado National Forest Land and Resource Management Plan (Forest Plan, PR 1). The purpose of the proposed action is to authorize livestock grazing in a manner consistent with Forest Service policy and the Forest Plan. The purpose and need arose because:

- The allotments require environmental analysis necessary to comply with the Rescission Act (*P.L. 104, 1995*).
- There is a need to incorporate additional management flexibility through an adaptive management strategy consistent with Forest Service policy (*FSH 2209.13, Chapter 90*).

- Additional watering facilities may be necessary to improve livestock distribution and improve the reliability of some pastures.
- Woody understory shrubs, especially manzanita (*Arctostaphylos* spp.) and juniper are encroaching into formerly more open grasslands and woodlands on the Price Canyon allotment. Dense chaparral reduces herbaceous production, exposing bare soil and increasing erosion. Extensive manzanita stands also contribute to the potential for catastrophic wildfires by providing large quantities of flammable material.

Existing Condition

The grazing allotments are located on the east side of the Chiricahua Mountains on the west side of the San Simon Valley (Figures 1-3). Elevations range from approximately 4,400 feet on the eastern edge of the project area to over 9,000 feet on Finnicum Peak. Most capable rangelands are found below 6,000 feet¹.

Vegetation and land form. 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 (PR 15). Lower elevations support a Desert Grassland community (Figure 4). Dominant native grasses include blue grama (*Bouteloua gracilis*), 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 the Jackwood allotment.

Broadleaf Evergreen Woodlands are the most widely distributed plant community in the project area. 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 (*Nolina microcarpa*), 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.

Coniferous forest communities are found at the highest elevations in upper Price Canyon. 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 Chihuahuan 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 is found in larger drainages, occurring in greatest quantity in Price and Brushy canyons. Dominant tree species include silverleaf oak (*Quercus hypoleucoides*), Emory oak (*Q. emoryi*), Arizona white oak (*Q. arizonica*) and alligator juniper. Upper elevations of Price Canyon support a coniferous riparian plant community comprised of oak and pines. This type is found in areas considered not capable for

¹ Capable acres are defined as areas under 40% slope and capable of producing 100 lbs per acre of forage. Areas considered “not capable” primarily consist of steep slopes in upper elevations of the allotments. No grazing capacity is assigned to non-capable areas.

grazing. Major drainages include Price, Brushy and Baker canyons on the Price Canyon allotment and Jackwood Canyon on the Jackwood allotment. Drainages run seasonally in response to precipitation events, but there are no perennial streams or wetlands in the analysis area.

Over the past century, fire has been largely absent from the landscape in the project area due to such factors as heavy grazing and active fire suppression. As a result, woody plants, especially manzanita and juniper have become dominant on many sites within the oak woodland. Manzanita is a successional species that germinates after fires. A regular fire interval tends to kill large mature plants and maintains a more open landscape. Many areas have burned once and never re-burned, encouraging manzanita to germinate and eventually dominate these sites to the exclusion of other species. Dense manzanita stands have the potential to burn with high intensity, creating hydrophobic (water-repelling) soils and resulting in long-term effects to soil productivity and stability. Therefore, these areas have been identified for mechanical thinning in order to reduce fuels while protecting soils.

Grazing Management. Current permitted numbers and recent grazing use on the allotments is displayed in Table 1. Current management and existing resource conditions are described below.

The **Jackwood** allotment is permitted for a total of 812 yearlings, November 1 to April 30. Two of the pastures (Klaus and Old Farm) are part of a larger ranch operation consisting of 50% Forest Service administered lands and 50% state and private holdings controlled by the permittee. Taken together, these intermingled lands form a natural grazing unit, so their use is authorized using on/off provisions in the permit². These pastures are used season-long by individual herds. A third herd is rotated through the two remaining pastures (Upper Jackwood and Lower Jackwood), which, except for 180 acres in Lower Jackwood, are entirely on the Forest. Use on the Forest is limited to 406 head through special terms and conditions in the grazing permit, with the remaining use on non-federal lands. The timing of pasture moves is determined by forage use monitoring and water availability. The entire allotment is rested each summer growing season (May-October). The allotment is dependant on earthen stock tanks and in dry years, water availability limits the ability of cattle to use the entire allotment.

Rangeland vegetation condition and trend were evaluated between 2004 and 2006 (PRs 6, 7). Eighty one percent (81%) of the allotment, primarily higher elevation pastures, is in fair or better condition and is meeting Forest Plan standards for ecological condition. Lower elevations on the allotment appear to be trending toward a drier plant community dominated by mesquite, snakeweed, annuals and Lehman lovegrass (*Eragrostis lehmanniana*). As a result, vegetation condition on some lower elevation sites is considered poor. Soils were assessed in 2006 and were found to be 92% satisfactory and 8% impaired (PR 26). Impaired soils typically occur on the same low flat sites dominated

² Permits with on/off provisions are issued when a portion of the logical grazing area contains both National Forest Service lands and lands controlled by the permit holder. The intent is to promote efficient use of intermingled ownership.

by woody plants and with little vegetative ground cover. Production and utilization studies conducted between 2004 and 2006 (PR 8, 11, 13) indicate that permitted use is within existing capacity.

The **Price Canyon** allotment is permitted for 190 cattle yearlong on a term permit and 9 horses yearlong on a private land permit. The allotment is divided into 13 pastures. Permitted use on the allotment was reduced from 250 head in 1990, which allowed for the implementation of a deferred rotation. Until recently, cattle were rotated through several lower pastures between spring and fall. Two upper elevation pastures were used primarily during the winter and rested each summer growing season and two additional small pastures were reserved primarily for horses and gathering cattle. The permittee has recently initiated a system under which pastures are grazed for short periods, typically two weeks, and then moved to the next pasture. Because of the relatively large number of pastures, this system allows for extended deferment between use periods. Rangeland vegetation and trend were evaluated between 2004 and 2006 (PR 5). Rangeland conditions are largely fair or better with upward trend, although Lehman lovegrass has invaded lower elevation sites. Soil assessments in 2006 found 83% of the soils on the allotment to be in satisfactory condition, with the remaining 17% impaired (PR 26). The Price Canyon riparian corridor was assessed in 1998 and was determined to be in good condition (PR 27). Production/utilization studies conducted by the Forest Service between 2003 and 2006 estimated stocking between 121 and 151 head (PR 12). A 2006 study conducted by a consultant hired by the permittee estimated a stocking capacity of up to 359 head (PR 14). The wide discrepancy between these two estimates is primarily a function of much higher estimates of annual forage production in the consultant's analysis, compared to Forest Service estimates. A secondary consideration is that the Forest Service uses more conservative allowable use factors. A more detailed discussion of the differences is in the project record as PR 55. Based on 20+ years of actual use records, initial mean capacity on the allotment is considered to be close to permitted use (190 head) in most years.

Table 1. Season of use, permitted numbers and stocking levels for the past 5 years. Use is shown in animal-months (No. of cattle x No. of months grazed) because numbers vary throughout the grazing year.

	Jackwood	Price Canyon
Total Acres	10,832	14,016
Capable Acres	10,301	11,596
Permitted No.	812 yearlings (406 on, 406 off) 4872 animal months (AM)	190 cow/calf 2280 animal months (AM)
Season of use	11/1-4/30	Year-long
2005-2006	4200 AM	1032 AM
2004-2005	3816 AM	360 AM
2003-2004	1200 AM	384 AM
2002-2003	4872 AM	568 AM
2001-2002	4872 AM	2280 AM
2000-2001	4872 AM	1560 AM

Management Direction

The allotments fall within Forest Plan management areas 4, 7 and 9 (Figure 5). Management emphasis for these areas is described below.

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). All of the Jackwood allotment and approximately 75% of the Price Canyon allotment fall within MA4.

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 Price and Brushy canyons on the Price Canyon allotment 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). The Upper Price pasture of the Price Canyon allotment falls 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 goals and site-specific knowledge of the allotments described above, 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 two allotments have stable soils, functional hydrology and support functional biotic communities. All sites are at or moving toward high similarity with their potential natural community.
- Lower elevation sites are dominated by warm season native perennial grasses and are increasing in diversity of grasses, forbs and shrubs. Encroachment of Lehmann lovegrass and woody shrubs is controlled through management.
- Native vegetation in riparian bottoms is a diverse mix of perennial grasses, forbs, shrubs and trees. Trees and shrubs show no evidence of high-lining or hedging. Suitable riparian bottoms throughout the allotments provide suitable year-round habitat for Montezuma quail and other species dependant on herbaceous and overstory cover.
- Areas with impaired soil condition have increasing ground cover and litter and little erosion.
- Within dense chaparral stands, shrub density contributing to poor ecological condition and high fire hazards is reduced and herbaceous cover is increased.
- Occupied habitats for threatened, endangered, sensitive and management indicator species are maintained or improved and recovery objectives are being met.
- All grazing improvements necessary for management on all allotments are in proper working order and are contributing toward improved livestock distribution and pasture reliability.

Proposed Action

The Forest's proposed action is to authorize continued livestock grazing on the Jackwood and Price Canyon allotments. The proposed action consists of four components - **authorization, improvements, management practices and monitoring** – and will be implemented using an adaptive management strategy. Light to moderate grazing intensities and regular growing season rest or deferment will be used to provide for grazed plant recovery, increased plant vigor and retention of sufficient herbaceous vegetation to protect soils and to provide herbaceous cover for wildlife. Existing structural range improvements would be maintained and new improvements would be built to the degree necessary to maintain or achieve management objectives. Selected areas of over-mature manzanita will be mechanically thinned. The proposed action is described in detail as Alternative 2 in Chapter 2.

Decision Framework

The Douglas District Ranger is the official responsible for decisions regarding management of the Jackwood and Price Canyon 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 Allotment Management Plans. These would include permitted number of animals, season of use, allowable utilization standards and the term of the permits. Decisions may be made separately for each allotment. That is, the District Ranger may select different alternatives for different allotments.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions in July, 2006. The proposal was provided to the public and other agencies for comment during scoping in July 2007 (PR 19). One comment letter was received in response to scoping (PR 20). In addition, the agency has met several times with the permittees on the allotments to identify management objectives and strategies (PR 17). Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address.

In March 2008, a draft of the EA (PR 44) 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 March 11, 2008 (PR 45). Five comment letters were received in response to this solicitation (PRs 46-50). A

summary of these comments and a Forest Service response is contained in the project record at PR 52.

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 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 21.

Key Issues

No issues were identified that could not be addressed through mitigation or project design modifications. Therefore, no additional alternatives were developed for the analysis.

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 – Lack of litter, soil compaction, low plant vigor and shrub encroachment are evident in areas of historic livestock concentration. Continued grazing on the allotments could affect soil condition. Effects could be either positive or negative depending on the timing, intensity, frequency and duration of grazing and other management activities.

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.

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)..."

Additional resource-related 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.

Grazing Capacity/Permit numbers – Public and permittee 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 in developing the proposed action, and estimates have been submitted by the permittees.

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 (PRs 5, 6, 7, 8, 11, 12) 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 recognizes that the capacity of individual allotments may increase or decrease over the term of the authorizations.

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 concerns, the Forest Service must focus its analysis on the **effects** of grazing. Effects are the result of the application of the timing, duration, frequency and intensity of livestock use, and can be entirely independent of permit numbers.

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 numbers on a year-to-year basis in order to achieve desired conditions.

CHAPTER 2 - ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the management of the Jackwood and Price Canyon allotments project. 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

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 not carried forward because it would not address the need to improve pasture reliability and increase management flexibility.

Partial Conversion of Price Canyon Allotment to Horses. The permittee for the Price Canyon allotment submitted a proposal to convert a significant proportion of the available AUMs to horses in order to have a supply of riding stock to support a guest ranch operation. This was ultimately not carried forward primarily because the primary use would be for other than livestock production. Such use would need to be authorized under a Livestock Use Permit rather than a Term Grazing Permit. The district also identified several resource concerns related to grazing significant numbers of horses within the allotment (PR 51).

Alternative 1

No Action

Under this alternative, grazing would not be authorized and use of the allotments by domestic livestock would be discontinued. 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. Woody vegetation treatments would not be authorized, but may be authorized

under a future decision. The need for such treatments would remain independent of any grazing authorization.

Alternative 2

The Proposed Action

The Forest's proposed action is to authorize continued livestock grazing on the Jackwood and Price Canyon allotments. The proposed action consists of four components - **authorization, improvements, management practices and monitoring** – and will be implemented using an adaptive management strategy. The four components are described below.

1. Authorization

Grazing would be authorized on the allotments under the following terms and conditions.

- **Duration and timing of grazing** - Use on the Price Canyon allotment would be authorized year-round using rotational grazing. Grazing management would be designed to insure that pastures receive periodic growing season rest or deferment in order to provide for grazed plant recovery. Use on the Jackwood allotment will be winter seasonal (10/15-5/15) to allow for annual summer growing season rest. On both allotments, the sequence and timing of pasture moves will be 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, increased plant vigor, and retention of herbaceous litter to protect soils and provide forage and herbaceous cover for wildlife. Consistent patterns of annual 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.

Administrative actions necessary to implement the decision. The following administrative actions would occur in order 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. The term grazing permit will identify the number, kind and class of livestock authorized and the season of use as required by Forest Service policy (FSM 2231.11). Permits will also identify the

⁴ Based on review of numerous grazing intensity studies, Holechek (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 35%-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%.

total animal unit months (AUMs⁵) authorized for each permit. The number and class of livestock and season of use would be allowed to vary depending on resource conditions and management objectives, provided that annual use does not exceed the total AUMs authorized or the season of use identified for the allotment. Such changes will be documented and authorized in annual operating instructions.

- **Jackwood:** 406 yearlings or equivalent for six months between October 15 and May 15 [Up to 1705 animal unit months (AUMs)]. The permit will also include special terms and conditions providing for the grazing of an additional 1705 AUMs on non-forest lands controlled by the permittee (on-off permit). The season of use would be increased by one month (two weeks on either end) to provide more flexibility in entering and leaving the allotment.
- **Price Canyon:** 190 cow/calf pairs or equivalent year-long (Up to 3010 AUM). Initially, stocking will remain at or below 170 head until improvements are completed to increase the reliability of some pastures. Incremental increases will be allowed based on forage availability and monitoring that demonstrate that management is meeting desired conditions. Four horses yearlong would also be authorized on a private land permit. Over the term of the authorization, the permittee may chose to waive additional private land within or adjacent to the allotment. In this case the private land permit may be modified to account for additional acreage and forage capacity associated with the private land.
- **Allotment Management Plans.** New allotment management plans (AMPs) would be developed for each allotment and would be incorporated into any term grazing permits issued. The AMPs will specify the goals and objectives of management, management strategies, range improvements and monitoring requirements and will incorporate an adaptive management strategy described below. The use of coordinated resource management plans (CRMPs) will be

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. of dry forage per day (Society for Range Management 1998, USFS 1997). 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. The amount of forage consumed varies based on the size and class of livestock consuming the forage. In general, forage consumption increases with increasing size of the animal using the forage. A cow/calf pair will typically consume more forage than a cow without a calf; a yearling will consume less. Thus an area of rangeland with the capacity to support a certain number of mature cows will likely support relatively fewer cow/calf pairs (or bulls or other larger animals) or relatively more yearlings (or other smaller animals) over the same period of time. The concept of animal unit conversion factors is incorporated into production and utilization studies accomplished by the Forest and is useful for comparing initial capacities on allotments for different classes of livestock. With the forage requirement of a mature cow as the base (1 AUM), the Forest Service Handbook defines a cow/calf pair as 1.32 AUM and a yearling as 0.7 AUM (FSH 2209.15(28)). Ultimately, however, range capacity can be variable and stocking is determined on an annual basis in response to actual use monitoring and current forage conditions.

encouraged where the presence of intermingled ownership is conducive to more flexible management.

- **Annual Operating Plans.** On an annual basis, the Forest and permittees will jointly prepare annual plans, referred to as Annual Operating Instructions (AOI), prior to each grazing year. The AOI will set forth:
 - The maximum permissible grazing use authorized on the allotment for the current grazing season and the numbers, class, type of livestock, and timing and duration of use.
 - The planned sequence of grazing in pastures on the allotment, or the management prescriptions and monitoring 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.

Using adaptive management, actual numbers of livestock may vary based on the class of livestock, the duration of use and climatic conditions. Grazing systems may also be modified as needed to meet stated management objectives.

2. Improvements

The need for projects to improve water distribution has been identified on both allotments in order to improve livestock distribution and pasture reliability (Table 2). These projects consist of extensions of pipelines from existing water sources, increasing the storage capacity of existing systems and installation of new drinkers. No new water diversions or wells are proposed. These improvements are 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 constructed. Monitoring may also indicate the need for additional improvements. In this case, the need for, and site-specific effects of, each additional improvement will be evaluated as described under *Adaptive Management*, below.

The responsibility for maintenance of range improvements is assigned to the permittee(s) in the terms and conditions of each grazing permit (FSM 2244.03). Maintenance activities include the repair of fences and water facilities, cleaning of stock ponds and other actions necessary to maintain the improvement in serviceable condition necessary to serve the purpose intended. On an annual basis, responsibilities for repair and maintenance of existing improvements will be identified in the AOI(s).

Table 2. Descriptions and objectives for proposed range structural improvements.

Allotment	Proposed Improvement	Objective
Price Canyon	Extend a pipeline southwest from Headquarters Well (private) approximately 1.5 mile into Southwest and Behind the Hill pastures (T. 20 S, R 30 E, Sec 1, 2 and 11)	Improve reliability of Southwest and Behind the Hill pastures and reduce use in lower Price Canyon
Jackwood	Extend a pipeline from the Forest boundary to a private parcel in the middle of Lower Forest pasture.	Improve reliability of the pasture and improve distribution.

Non-structural Improvements. In addition to structural improvements, the Forest proposes to mechanically thin manzanita stands in selected sites in the Price Canyon allotment. This would involve the use of a mower or similar machine to selectively shred individual manzanita and juniper plants in order to reduce canopy cover and increase herbaceous ground cover. This work is typically done using a rubber tired, articulated tractor with a front-mounted rotating mower attachment capable of chopping woody material into small pieces, which are scattered on the ground leaving a cover of woody mulch.

3. Management Practices.

To mitigate resource impacts, the following measures will be implemented. These practices have been demonstrated to be successful when used on similar projects and are considered effective at reducing environmental impacts. They are consistent with applicable Forest Plan standards and guidelines, Best Management Practices and the terms and conditions and conservation measures of applicable U.S. Fish and Wildlife Service Biological Opinions. Implementation of the mitigation measures and design criteria is intended to preclude the occurrence of potentially significant 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, increase herbaceous residue needed 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.
- Management practices will be used to achieve proper distribution or lessen the impact on sensitive areas. Practices include herding, salting and controlling access to waters. Salt will be placed on good feed, one quarter to one half mile from waters and salting locations will be moved annually. Placement of liquid or bulk supplements will require prior approval of the District Ranger.
- No hay will be placed on Forest lands in order to minimize the introduction of weed seeds.

- Mechanical thinning will not be conducted in wet conditions in order to avoid soil disturbance and compaction. Areas to be treated will be limited to less than 20% slope and buffers will be left around all primary drainages.
- Mechanical thinning would selectively target manzanita and small junipers. Large oaks and junipers, agaves and other non-target species would be left standing.

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

- All water developments will include wildlife access and escape ramps. Waters will be kept available to wildlife year round.
- All new and reconstructed 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. The objective is to avoid impacts to lesser long-nosed bat food resources.
- All proposed range facilities will be evaluated by a qualified wildlife biologist for effects to 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 Montezuma 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. 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 direct or indirect impacts caused by ground-disturbing activities associated with the construction of range facilities and to monitor the effects of cattle grazing on sites to ensure that adverse effects are not occurring. In general, these measures include the following:

- All proposed range facilities will be surveyed by qualified personnel for heritage resources prior to any ground-disturbing activities. Facilities will be built or modified to avoid impacts to sites. If unrecorded sites are discovered during the course of project implementation, activities will cease and the Forest Archeologist will be notified.
- Range facilities, if needed, will be located so as to avoid concentrations of livestock on identified heritage resource sites.
- 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.
- Areas identified for mechanical thinning of manzanita will be surveyed by qualified personnel for heritage resources prior to any ground-disturbing activities. Any heritage resources identified will be flagged and avoided during treatments.

4. 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. Monitoring is necessary under the adaptive management strategy proposed in order to implement timely and effective management changes.

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 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 Rangelands (PR 37).

Utilization will be monitored on key forage species, which are 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. Utilization on non-grass species (forbs, shrubs and trees) may also be measured if appropriate for the site. 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

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.

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.

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 permittees.

Adaptive Management

Adaptive management uses the documented results of management actions (monitoring) to continually modify management in order to achieve specific objectives, which are identified under *Desired Condition* in Chapter 1. Adaptive management provides the flexibility to adjust livestock numbers and the timing of grazing so that use is consistent with current productivity and is meeting management objectives. Under the adaptive management strategy proposed, the specific number of livestock authorized, specific dates for grazing, class of animal and modifications in pasture rotations may be administratively modified as determined to be necessary and appropriate, based on implementation and effectiveness monitoring. However, such changes will not exceed the limits for timing, intensity, duration and frequency authorized in the NEPA-based analysis and decision. Administrative changes will be documented and implemented in the AOI, AMP and/or the term grazing permit.

Adaptive management also includes monitoring and analysis 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 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 would be allowed to continue. If monitoring demonstrates that objectives are not being met and management options beyond the scope of the analysis are warranted, or if new information demonstrates significant effects not previously considered, a new proposed action would be developed and further analysis under NEPA will occur.

Comparison of Alternatives

Table 3 provides a summary of the attributes of each alternative. Information in the table is focused on design features and how well they meet the purpose and need. Detailed comparisons of the effects of each alternative are discussed in Chapter 3.

Table 3. Comparison of the Alternatives.

Attribute	Alternative 1	Alternative 2
National Forest Policy and Forest Plan Consistency	Consistent with Forest Plan. Not consistent with policy (FSM 2202.1, 2203.1)	Consistent with Forest Plan and policy.
Meets purpose and need	N/A	Yes. Resolves distribution issues and balances use with capacity. Provides management flexibility.
Effect on Wildlife and Plants	No Effects from grazing.	Effects mitigated. Improved distribution reduces localized effects to habitats.
Effects on soil and watershed condition	No effects from grazing. Improvement in soil and watershed cover over time.	Additional waters increase management flexibility and contribute to improved distribution. Moderate use contributes to watershed stability. Concentrations of cattle contribute to localized soil impairment. Short-term effects result from thinning activities, but soil cover increases over the long term.
Effects on upland vegetation	No effects from grazing. Increasing plant cover and litter over time.	Additional waters increase management flexibility and contribute to improved distribution. Increased use in uplands and localized effects around waters. Moderate use levels minimize effects.

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. The chapter is organized by resource. Within each section, the affected environment is briefly described, followed by the environmental consequences (effects) if implementing each alternative.

Wildlife

Affected Environment - Wildlife

The Chiricahua Mountains are part of an archipelago of “sky islands” connecting the Rocky Mountains to the north with the Sierra Madre Occidental of Mexico. The location, combined with the topographic relief found in the Chiricahua Mountains contribute to high structural and plant species diversity and a corresponding high diversity of wildlife species, including many Mexican species rarely seen in the U.S. The area is especially important for migratory birds. The entire Chiricahua Mountain range is identified by the National Audubon Society as an Important Bird Area.

Threatened, Endangered and Sensitive Species.

Lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). The lesser long-nosed bat (LLNB) was listed as Endangered without critical habitat on September 30, 1988 (53 FR 38456). The species feeds on the nectar and pollen of paniculate agaves (*Agave palmeri*, *A. parry*, and *A. deserti*) and the nectar, pollen and fruit of columnar cactus. Paniculate agaves are found on both of the allotments and the LLNB is known to roost and forage throughout the Chiricahua Mountains between July and September each year. No roosts are known from either allotment.

Jaguar (*Panthera onca*). The Jaguar is listed as endangered without critical habitat (62 FR 39147, 1997). Jaguars are found in habitats ranging from Sonoran desert scrub to subalpine coniferous forest. Since 1996, jaguars have been photographed twice in the Peloncillo Mountains, approximately 20 miles southeast of the project area. Documented occurrences within the Chiricahua Mountain complex include a confirmed kill in 1986 (in the Dos Cabezas Mountains to the northwest) and reports dating back to the early 20th century. No jaguars are currently known to inhabit the Chiricahua Mountains and there are no records of the species on the two allotments. However, given the relative orientation to historic and recent jaguar observations, the rugged characteristics of the allotments and the wide-ranging habits of jaguars, both allotments are considered to have some potential as travel corridors or hunting areas. Based on recent occurrences, a jaguar or jaguars may be reasonably expected to occur in the project area in the next ten years.

Mexican Spotted Owl (*Strix occidentalis lucida*). The Mexican spotted owl was listed as threatened in 1993. Critical habitat was listed in 2003. There are two Mexican spotted owl Protected Activity Centers (PACs) within this area of the Chiricahua Mountains. Portions of these PACs occur within the Price Canyon Allotment and a portion of Price Canyon is mapped as critical habitat. One PAC has never been confirmed as occupied by spotted owls. The other PAC produced 2 young in each year it was surveyed (1991 and 1993), but this PAC has not been recently surveyed. Suitable spotted owl nesting and foraging habitat associated with both PACs is located almost entirely outside of capable range and topographical features generally restrict access to these habitat areas by cattle. No PACs or critical habitat are found on the Jackwood Allotment.

Chiricahua Leopard Frog (*Rana chiricahuensis*). The Chiricahua leopard frog (CLF) was listed as threatened, without critical habitat in 2002. 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 10+ miles north of the project area, but the status of this population is unknown. There are no records of the species from the project area, nor are there perennial streams or wetlands that would provide suitable habitat.

Forest Service Sensitive Species

Sensitive species are those species that are likely to occur or have habitat in the project area and that have been identified by the Regional Forester as of concern for reduction in population viability as evidenced by 1) significant current or predicted downward trends in population numbers or density, or 2) significant current or predicted downward trends in habitat capability that would reduce a species' distribution. (Forest Service Manual 2670.5). The Regional Forester's list of sensitive plant and animal species was revised and updated in September 2007, and was the basis for the analysis.

Table 3. Sensitive wildlife and plant species considered in the analysis.

Species	Comments
Birds	
Gould's Wild Turkey <i>Meleagris gallpavo mexicana</i>	Well-established population in Chiricahua Mountains due to recent AGFD transplant activities. Suitable habitat in Price Canyon. Not documented, but likely to occur.
American Peregrine Falcon <i>Falco peregrinus anatum</i>	Nests and forages in the mountain range.
Apache Northern Goshawk <i>Accipiter gentilis apache</i>	Suitable habitats (Apache, Chihuahua and Ponderosa pine forests) in Upper Price Canyon.
Arizona Grasshopper Sparrow <i>Ammodramus savannarum ammodramus</i>	Breeds in Chihuahuan desert grasslands. Potential habitat in lower elevation grassland in project area.
Baird's Sparrow <i>Ammodramus bairdii</i>	Records from grassland in San Simon Valley. Limited habitat on fringe of project area.

Species	Comments
Invertebrates	
Four Spotted Skipperling <i>Piruna polingii</i>	Found in moist woodlands from central Arizona south to Mexico. Not documented from the project area, but suitable habitats exist.
Mammals	
Arizona Shrew <i>Sorex arizonae</i>	Found in mist canyon bottoms with dense vegetation and woody debris. Occurs in Chiricahua Mountains but not known from project area. Suitable habitats in upper Price Canyon.
Allen's Lappet-browed Bat <i>Idionycteris phyllotis</i>	Records from Price Canyon and elsewhere in the Chiricahua Mountains. Roosts in caves, mines and trees.
Chiricahua Fox Squirrel <i>Sciurus nayaritensis chiricahuae</i>	Population well distributed throughout mountain range. Suitable riparian and woodland habitats in Upper Price Canyon.
White-nosed Coati <i>Nasua narica</i>	Found in riparian and woodland habitats throughout the range.
Reptiles	
Twin Spotted Rattlesnake <i>Crotalus pricei</i>	Occurs throughout Chiricahua Mountains, Suitable habitats in project area.
Plants	
Chiricahua Rock Cress <i>Aribis tricornuta</i>	Found in upper elevations (above 6,000 feet) in Chiricahua Mountains. Potentially occurs in upper Price Canyon.
Arizona Alum Root <i>Huechera glomerata</i>	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.
Chiricahua fleabane <i>Erigeron kuschei</i>	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.
Chiricahua Mountains Brookweed <i>Samolus vagans</i>	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 possibly occur in upper Price Canyon.
Coppermine milk-vetch <i>Astragalus cobrensis</i> var. <i>maguirei</i>	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 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.

Management Indicator Species

Forest Plan direction for Management Indicator Species (MIS) is to maintain or improve occupied habitat (PR 1). Forest-wide trends of all MIS have been assessed and are reported in the Forest-wide Status Report for Management Indicator Species (PR 24). 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. A description of the selection criteria and in-depth evaluations of project-level impacts are contained in a separate report (PR 34).

White-tailed deer (*Odocoileus virginianus couesi*). The entire project area (approximately 25,000 acres) is considered suitable habitat, and represents less than two percent of the total occupied habitat on the Forest. Habitat and population trends are considered stable (PR 24). White-tailed deer tend to use hilly, mixed-oak habitats with a grass understory more than other types and tend to avoid open areas. (Ockenfels et al. 1991). The presence of freestanding water is important for suitable whitetail habitat and they likely benefit from the presence of permanent livestock waters in the allotments.

Black bear (*Ursus americana*). 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 both allotments and the project area represents 4.0% of the occupied habitat on the Forest.

Montezuma (Montezuma) 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). Montezuma quail habitat is common throughout the Forest, encompassing approximately 225,000 acres. 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. The maintenance of grass height over 6" is necessary to provide sufficient cover for the birds to hide from predators. Forest Service Manual guidance (PR 38) restricts grazing in mapped high density Montezuma quail habitat to 45% by weight in order to meet this objective. Much of the Price Canyon allotment appears to 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 38).

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. Broadleaf evergreen woodland, coniferous forest and evergreen riparian communities are common in the project area, all of which provide abundant mature trees for cavity nesters.

Environmental Consequences

Threatened and Endangered 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 in 1998 and again in 2002 (USFS 1998, 2002). The effects of continued implementation of the Forest Plan, including livestock grazing, were evaluated in 2005 (USFS 2005, USDI-FWS 2005). Livestock grazing is currently managed to comply with the 2002 and 2005 Biological Opinions from the U.S. Fish and Wildlife Service (USFWS) (PR 23). Based on minor 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 35). Informal consultation was completed on December 28, 2007 (PR 40). 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 35).

Lesser long-nosed bat. In 2002 the Forest determined that grazing as practiced on the four allotments may adversely affect the LLNB (PR 23). Take was not assessed and no terms and conditions were issued. This determination was based on the following rationale: The LLNB feeds on flowering agaves on the Forest between July and September. Agave stalks, as they begin to bolt are particularly palatable to domestic livestock. If pastures are grazed during April and May when agave stalks are accessible, livestock may feed on young agave stalks, precluding the plant from flowering and potentially reducing forage resources for LLNB. However; it has not been established that grazing by livestock significantly increases herbivory on agaves compared to ungrazed areas. Because deer and other wildlife also feed on the plants, levels of herbivory on agaves have been found to be similar in both grazed and ungrazed pastures. (Widmer 2002, Bowers and McLaughlin 2001). In addition, livestock herbivory on agaves diminishes significantly at distances greater than 0.75 mile (1.21 km) from water (Widmer 2002).

No surveys of agave density or estimates of the extent of livestock herbivory have been made on the allotments; however, ocular estimates of the allotments indicate that agaves are well distributed throughout the project area, with highest densities in the desert grassland communities at lower elevations.

Under *Alternative 1*, no effects are anticipated as livestock will be removed from the allotments and agaves will not be exposed to grazing. Under *Alternative 2*, management practices described under the proposed action will be used to avoid the destruction of agaves as a result of construction activities. Grazing may occur during a portion of the agave bolting season (April 1- June 15) in each allotment. On the Jackwood allotment cattle would be removed by May 15 each year, no exposure is anticipated during the balance of the agave bolting season. On the Price Canyon allotment, cattle could potentially be rotated through 2-4 pastures, but the majority of pastures would not be grazed. The focus on grazing outside bolting season (Jackwood) or deferring most pastures (Price Canyon) suggests that the effects of grazing on agaves are likely to be insignificant or discountable. Thus, a Forest Biologist determined that the proposed action **may affect, not likely to adversely affect** the LLNB

Jaguar. In 2002, the Forest determined that ongoing grazing is not likely to adversely affect the jaguar based on the conclusion that grazing does not affect movement corridors for the species (PR 23). 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, and predator control activities do not occur on the allotments. At present, activities that potentially affect jaguars are those that result in fragmentation of habitats or disruption of movement corridors that allow dispersal into unoccupied habitat.

Excessive removal of woody or herbaceous vegetation, particularly within riparian corridors, could affect cover for jaguars and/or their prey; however, jaguars are not dependent solely on dense vegetation for escape or protective cover. Habitat remoteness and steep topographic relief appear to provide the majority of cover available to this species in the southwest.

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*, 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. Livestock grazing within the project area is not predicted to reduce woody cover in bottoms or uplands. Removal of herbaceous cover by grazing livestock would continue, but this would not significantly affect cover for jaguars. Jaguars may prey on livestock, but such predation has not been documented in the project area. Based on this, the Forest concludes that the proposed action **may affect, but is not likely to adversely affect** the Jaguar on both allotments.

Mexican Spotted Owl. In 2002 the Forest determined that ongoing livestock grazing is not likely to adversely affect the MSO on both allotments. Under *Alternative 1* no effects are anticipated. Under *Alternative 2*, grazing may

For the second PAC (#0501A014), almost all suitable spotted owl nesting and foraging habitat is outside of capable range and topographical features generally restrict access to these habitat areas by cattle. This PAC produced 2 young in each year it was surveyed (1991 and 1993). The fourteen-pasture rotation implemented on this allotment should minimize adverse effects on species that serve as prey for Mexican spotted owls. Under the current and proposed operating plans, cattle will be removed from this allotment before maximum utilization occurs, assuring that habitat for small mammalian prey will remain present on the allotment. Some human disturbance to owls could occur during the implementation of proposed improvement activities; however, each of these projects will be assessed and evaluated by a journey-level biologist prior to implementation.

Temporary foraging disturbance could occur during periods when cattle are moved from pasture to pasture or in the day-to-day running of ranching activities. **(May affect, not likely to adversely affect)**

Forest Sensitive Species

Gould's turkey (*Meleagris gallopavo mexicana*). Within the analysis area, suitable habitats are coniferous woodland, riparian corridors in oak woodlands, and grassland savannas. The species appears to be able to coexist with well-managed livestock grazing. Limiting factors appear to be the presence of roost trees of sufficient size and the availability of free water. Grazing and livestock management activities potentially impact turkeys by reducing grasses that produce seeds for foraging and promoting the encroachment of woody vegetation reducing the amount of open areas that are useful for strutting and other reproductive activities. Livestock waters likely benefit turkeys, and

mitigation measures would assure that all waters are accessible. Neither alternative will affect roost trees. Effects are expected to be limited to disturbance as a result of minor construction or livestock management activities and localized removal of grass cover and forage. The proposed action *may impact individual turkeys, but is not likely to result in a trend toward federal listing or a loss of viability.*

Peregrine falcon (*Falco peregrinus anatum*). Peregrines nest and forage in cliff sites in the Chiricahua Mountains. There are no known nests sites in the project area, but the area contains steep cliff faces preferred by this species for nesting and predator avoidance, as well as a variety of prey (e.g., birds, small mammals, and reptiles) for foraging. Use of the area for grazing does not interfere with the prey base of the area, nor does it directly impact nesting areas for this species. *No impact*

Northern goshawk (*Accipiter gentilis apache*). 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. There is one goshawk post-fledging family area (PFAs) located in upper Price Canyon outside of areas that are grazed. Grazing would not occur within the PFA under either alternative. Outside of the PFA, moderate (<45%) utilization should maintain vegetative diversity and would not be expected to affect prey species abundance. *No Impact.*

Arizona grasshopper sparrow (*Ammodramus savannarum ammodramus*). This small bird breeds and winters in southeastern Arizona grasslands, generally between 3,800 and 5,300 feet elevation. Range-wide, this species is declining; this drop is attributed to many factors, including over-grazing, loss of natural fire regimes, and urban and agricultural development (AGFD 2006). Impacts attributable to grazing should be mitigated by moderate utilization, pasture rest and an emphasis on winter use in the Jackwood allotment. Benefits for this species may be achieved as a result of the non-structural improvements (i.e., mechanical treatment of woody species) associated with the proposed action. *May impact, but is not likely to cause a trend toward listing.*

Four Spotted Skipperling (*Piruna polingii*). This species is found in moist woodlands, meadows, ravines, and streamsides in the mountains from central Arizona south to Mexico. While they have not been documented from the project area, suitable habitat exists. The caterpillars feed on native grasses, and the adults feed on the nectar of yellow composite flowers. Grazing activities could, by feeding and by trampling, reduce available grasses and flowers available for this species. Any negative impacts attributable to grazing should be mitigated by pasture rotations in the Price Canyon allotments and by focusing the grazing within the Jackwood allotment during the dormant season. *May impact, but is not likely to cause a trend toward listing.*

Arizona Shrew (*Sorex arizonae*). Dense leaf litter and forest debris, such as downed logs are important as cover for foraging shrews. The species has been documented Rucker and Pine canyons and in East Turkey Creek, but not in the project area. Limited suitable habitats are found in the upper reaches of Price Canyon. Effects from livestock grazing would only occur if livestock were allowed to concentrate in narrow wet canyons

preferred by the shrew, and if this use resulted in the degradation of leaf litter and herbaceous cover that provide habitat. Suitable habitats are located in areas that are not grazed. Based on this, the proposed action *may impact individual Arizona shrews, but is not likely to result in a trend toward federal listing or a loss of viability.*

Allen's Lappet-browed Bat (*Idionycteris phyllotis*). These bats inhabit areas of pine and pine-oak vegetation, as well as riparian areas. Their diet consists mainly of moths, but beetles and flying ants may also be taken. Records of this bat indicate presence in Price Canyon, and they are likely present in other areas of the Chiricahuas as well. The proposed action will not affect caves or mines used for roosting. Livestock waters, if poorly designed, may be unsuitable for bat use and may result in mortality. *May impact individuals, but is not likely to cause a trend toward listing.*

Chiricahua Fox Squirrel (*Sciurus nayaritensis chiricahuae*). Suitable habitats are found in upper elevations of the project area in pine-oak forests and evergreen and coniferous riparian plant communities. Fox squirrels are highly arboreal and are unlikely to be affected by moderate levels of grazing. Light to moderate livestock grazing as proposed should provide for tree recruitment. In addition, very little grazing is anticipated in upper elevation canyons that provide the best squirrel habitat. *No impact.*

White-nosed Coati (*Nasua narica*). This species is common in oak woodlands and riparian habitats throughout the Forest. Identified threats include indiscriminate killing and predator control. The Arizona Game and Fish Department restricts the take of this species through an annual bag limit. No predator control is proposed as part of the proposed action. Managed grazing does not affect woodland habitats for this species. Compaction of vegetation around riparian areas may cause a reduction in insect and other invertebrate presence, affecting coatis by removing potential food sources. *May impact, but is not likely to cause a trend toward listing.*

Twin-spotted rattlesnake (*Crotalus pricei pricei*). This rattlesnake is locally common on talus slopes in ponderosa pine, aspen, and mixed conifer, generally above 8,000 feet in elevation. Habitats for this species are relatively secure on the Coronado National Forest. The greatest threats seem to be habitat loss and illegal collecting. Current telemetry research indicates that historic habitat remains occupied. This species is likely to be unaffected by continued grazing practices. Talus slopes are not amenable to cattle grazing, due to loose footing and sparse vegetation; as such, these areas are unlikely to be impacted by grazing activities. *No impact.*

Chiricahua rock cress (*Arabis tricornuta*). This perennial forb is found on steep, rocky slopes as an understory for madrean evergreen woodlands and montane conifer forests. While undocumented for the area, there is potential habitat for this species in the upper elevations of the Price Canyon allotment. If present, there is potential for loss of individual plants due to cattle consuming or trampling them. It is unlikely that taking of individuals will create a population-level effect. *May impact, but is not likely to cause a trend toward listing.*

Arizona alum root (*Heuchera glomerulata*). This species occupies moist fairly open areas, trails, and roadsides in oak woodland, oak-pine, and pine forest up to approximately 8,500 feet in elevation. Under the proposed action, negative impacts may

occur to individuals due to trampling. *May impact, but is not likely to cause a trend toward listing.*

Chiricahua fleabane (*Erigeron kuschei*). This plant is known only from the Chiricahua Mountains at elevations above 6,900 feet on shaded, north-facing cliffs and ledges carpeted with moss. Known populations are not accessible to livestock. *No impact.*

Chiricahua Mountains Brookweed (*Samolus vagans*). This perennial herb grows in wet, sandy soils, ranging from 4,000 to approximately 7,200 feet in elevation. It is generally found in the understory of Madrean evergreen woodlands and coniferous forests. Suitable sites possibly occur in upper Price Canyon. Grazing activities could lead to trampling or consumption of individual plants. *May impact, but is not likely to cause a trend toward listing.*

Coppermine milk vetch (*Astragalus cobrensis* var. *marguieri*). 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. There are no records of the species from the allotments. The plant is relatively palatable and is subject to impact by livestock grazing. Populations elsewhere in the Chiricahua Mountains were surveyed in 2001 (Malusa 2001) and do not appear to be threatened by current levels of human use. Individual plants could be grazed or trampled, but the species appears to be fairly tolerant of disturbance. The proposed action *may impact individual plants, but is not likely to result in a trend toward federal listing or a loss of viability.*

Management Indicator Species

White-tailed Deer. Heavy grazing prior to and during the fawning period reduces hiding cover and may reduce fawn survival and recruitment (Ockenfels et al. 1991). Overgrazing by livestock may reduce available grass forage and lead to increased livestock use of browse plants and forbs used by deer. *Alternative 1* would maintain cover year-round. Under *Alternative 2*, grazing would occur prior to the fawning period and is expected to reduce cover in grazed pastures. Utilization limits should insure that grazing would not be of sufficient intensity or duration to affect large scale reductions in cover or result in competition. Displacement or disturbance of deer would occur during times when cattle are actively grazing a pasture or in those areas where manzanita is shredded, but such disturbance would be short term and would not be expected to affect deer population trends. Steeper slopes and remote areas preferred by deer would continue to be grazed lightly. Grazing as proposed continues management practices that have been in place for several years and that have allowed white-tailed deer to persist. In consideration of the foregoing, grazing as proposed is unlikely to cause a detectable change in white-tailed deer populations or a loss of occupied habitat.

Black Bear. Black bear populations are highly correlated to annual precipitation and its effect on the production of preferred foods such as oak acorns and manzanita berries (mast). Manzanita, oak and other mast-producing plants are abundant throughout the project area. The proposed action does not include features that would affect mast production. Grass can be seasonally important in black bear diets, especially in the spring. Given the moderate use grazing levels and rest and deferment proposed, competition for forage would not be expected under the proposed action. There may be a

slight potential for bear depredation on livestock during years of poor bear forage production, but this potential is considered small in light of the lack of records of past problems. Moreover, grazing on the Jackwood allotment would be limited to winter use, so cattle would not be present when bears are active during the summer. In consideration of the foregoing, grazing as proposed is not expected to cause a detectable change in black bear populations or a loss of occupied habitat.

Montezuma Quail. *Alternative 1* would maximize the amount of residual herbaceous cover that provides Montezuma quail habitat within the analysis area and would be expected to meet Forest Plan standards and guidelines for the quail. However, light to moderate grazing that leaves adequate cover apparently benefits habitat quality when compared to ungrazed areas by increasing the availability of food resources (Brown 1982, Bristow and Ockenfels 2000 (PR 39)). Therefore, the No Action alternative may not be optimum for Montezuma quail. In addition, Montezuma quail populations are highly correlated to the amount and timing of summer precipitation. In the absence of sufficient precipitation, the effects of management changes alone on long-term trends for quail populations may not be discernable. *Alternative 2* will result in a slight increase in herbaceous cover compared to current conditions. Proposed changes in management that incorporate growing season rest should increase grass plant production and vigor. Monitoring records indicate that range vegetation condition within the woodlands preferred by Montezuma quail is in fair to good and riparian conditions are satisfactory. Forest manual guidance will be implemented across the landscape through a utilization guideline of 30-45% (Forest Service Manual Supplement 2631.1, PR 38). In consideration of the foregoing and assuming Montezuma quail manual guidance is applied, grazing as proposed is unlikely to cause a detectable change in Montezuma quail populations or a loss of occupied habitat.

Baird's Sparrow (*Ammodramus bairdii*). This sparrow breeds in the mixed grass prairies of the northern Great Plains and winters in the southwest. The species has not been documented on the Forest. Grasslands south and east of the Chiricahua Mountains on state and private land have been identified as potential wintering habitats (Whetstone 1995), but suitable habitats are limited on the Forest. The Forest boundary roughly follows the edge of the woodland. *Alternative 1* would result in the greatest development of herbaceous cover over the life of the project. *Alternative 2* would manage for light to moderate use levels, resulting in the maintenance of the limited suitable habitat on the allotments. Considering the limited suitable habitat available in the project area and the limited intensity and duration of grazing in potential habitats, implementation of either of the alternatives would not result in a detectable change in Baird's sparrow populations on the Forest or a loss of occupied habitat.

Primary and Secondary Cavity Nesters. Cavity nesters generally benefit from conditions that promote uneven aged forests with older age trees for cavities and sufficient recruitment of younger trees. Grazing-related activities would affect cavity nesters only if they are of sufficient scale and intensity to change the rate of regeneration of cavity bearing trees. No activities are proposed that would change the amount or distribution of large trees in upland sites. In riparian areas, grazing potentially reduces the recruitment of trees through trampling or browsing on small trees by livestock. Dormant

season use proposed for the Jackwood allotment should allow for riparian tree growth and recruitment during the growing season. On the Price Canyon allotment, Upper Price Canyon would continue to be lightly grazed or ungrazed. Elsewhere, pasture rest and deferment or will limit the amount of time livestock are in any pasture, allowing for recruitment of riparian vegetation where the potential exists. The proposed action is not anticipated to affect the amount or distribution of trees in the project area. Therefore, grazing as proposed is unlikely to cause a detectable change in cavity-nester populations or a loss of occupied habitat.

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 (USFWS 2002). 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

Affected Environment

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 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 (PR 15). The reference range sites used to describe the potential natural community for the purpose of determining rangeland condition include sandyloam uplands, clay loam uplands, loamy uplands and volcanic hills all in the 16-20 inch precipitation zone (PR 15). Rangeland vegetation was assessed in 2004 by the Forest Service (PR 5, 6) and in 2005 by a consultant hired by the permittees (PR 10). On the Price Canyon allotment, vegetation condition is fair to good with stable or upward trends. On the Jackwood allotment, lower elevation sites have undergone a shift from a mixed semi-desert grassland to a drier community with increasing amounts of mesquite, snakeweed, Lehmann lovegrass and annuals. Plant composition, frequency and vigor are below what

would be expected in the climax community. Prior to the late 1970's, the Jackwood allotment was grazed year-round and lower range conditions occur in flatter areas where livestock historically (pre-1976) concentrated under year-round use. Although this type of use no longer occurs – the allotment is rested every summer growing season – in some of these areas soils may have lost their inherent productivity and may not recover for many years.

Environmental Consequences

Alternative 1 would allow for vegetation recovery in some but not all 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 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 or where woody species already dominate the community. 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 may reduce the density of woody species such as mesquite and snakeweed that have invaded the desert grasslands. Sites supporting dense manzanita stands would continue to support a high density of woody species and low amounts of herbaceous cover.

Alternative 2 will 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. Moderate use proposed is expected to leave sufficient residual biomass to protect soils. Annual growing season rest on the Jackwood allotment and regular rest or deferment on the Price Canyon allotment should allow for growth and reproduction of perennial grasses each summer. Because of limited water distribution in some years and the tendency of cattle to concentrate in flatter areas, management will be necessary to assure more even forage utilization. Provided management and monitoring are sufficient to achieve proper distribution, *Alternative 2* should result in the attainment of desired conditions.

Mechanical treatment of manzanita stands would result in short term disturbance related to equipment operation. Significant reductions in the woody overstory would occur in treated sites. Over time, increases in herbaceous cover are anticipated as grasses re-colonize opened sites.

Riparian Condition

Affected Environment

Perennial streams and wetlands do not occur in the project area. Stream channels within the project area contain flowing water only after rains or for short durations during spring

runoff. In some areas, subsurface flow sustains small areas of riparian vegetation. Upper Price Canyon supports a mix of evergreen riparian vegetation (Emory and other oak species and alligator juniper) and coniferous riparian vegetation (Chiricahua pine, Arizona cyprus and Douglas fir). Upper Price Canyon receives little livestock use because riparian sites are located high in the canyon primarily in non-capable rangelands. Deciduous riparian species (e.g. willow and ash) are found in small numbers at lower elevations in a short stretch of Jackwood Canyon (PR 27). Jackwood Canyon is rested every summer but is accessible to livestock through the winter and spring.

The analysis of riparian area condition is based primarily on information gathered at established riparian area monitoring points in Jackwood and Price canyons using the Riparian Area survey and Evaluation System (RASES). These areas were assessed in 1998 (Price Canyon) and 2001 (Jackwood Canyon) for condition and to verify the accuracy of the vegetation classification (PR 27). Stream channels are generally meeting the standards of the Forest Plan. Recruitment of riparian vegetation in Price Canyon was good and vigor was fair to good. In 2001, recruitment and vigor of riparian vegetation in Jackwood Canyon was poor to fair with areas showing signs of heavy livestock use (PR 27).

Environmental Consequences

Livestock grazing may impact riparian area condition by compacting or altering the soil surface or by removing plant material, thereby affecting bank stability; or by grazing on individual plants, thereby changing the vegetation composition and affecting the vigor of the grazed plants.

Alternative 1 (No Action/No Grazing). Riparian areas in upper Price Canyon are located in sites that are largely ungrazed, so these areas are unlikely to change significantly. In Jackwood Canyon, vegetation would be expected to show improved recruitment and vigor in the absence of livestock grazing. A reduction in streambank alteration and increases in vegetative groundcover would contribute to bank stability. Elimination of browsing on riparian vegetation would be expected to increase riparian plant vigor and recruitment of young trees.

Alternative 2 (Proposed Action) will allow for summer growing season recovery each year on the Jackwood allotment. 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. Historically, livestock have concentrated in a small portion of Jackwood Canyon and have affected the vigor of riparian plants. These effects are anticipated to continue unless more intensive management is used to reduce use. Using adaptive management, monitoring should allow management to identify and respond to problems as they occur. On the Price Canyon allotment, current management appears to be maintaining riparian condition. No additional effects are anticipated.

Soil Condition

Affected Environment

The geology underlying the project area is generally rhyolitic tuff, lava flows, and intrusive rhyolitic rock in the uplands, with alluvium along the gentle terrain near the Forest Boundary and in the larger canyons. Jackwood Canyon in the Jackwood allotment is an exception as basalt lava and cinders are the underlying geology. In general, the soils are shallow to deep very cobbly sandy loams with numerous rock outcrops.

Soil condition field monitoring has been ongoing for years and the latest information was collected in 2006 (PR 26). Both allotments were evaluated using protocols from Forest Service Soil Management Handbook 2509.18-99-1 R3. Soil condition was evaluated by using a combination of field inspections and information about slope, vegetation community and rangeland condition. Field observations indicate that flatter, lower elevation sites display surface soil characteristics indicating impaired soils. These include 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. Impaired soils are found on 17% of the Price Canyon allotment and 8% of the Jackwood allotment. Soil texture and depth have not been modified, so no soils are considered unsatisfactory.

Environmental Consequences

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). *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. Areas of impaired soils would persist for several years. Under *Alternative 2*, vegetation cover, soil bulk density and soil structure will continue to be altered by grazing livestock. Change in soil quality is a long-term process and no significant improvements would occur over the short term (5-10 years). Monitoring actions identified under the proposed action and adaptive management strategies will allow more flexibility in herd management. The permittees 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 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 Consequences

Activities resulting from this project will not significantly affect the factors contributing to a high quality air shed. No direct or indirect effects would occur to air quality from either alternative. Because there will be no direct or indirect effects, no cumulative effects are anticipated.

Water Quality and Quantity

Affected Environment

The allotments lie within the San Simon River Headwaters 5th Code Watershed. This watershed is 214,000 acres in size, and the allotments comprise just under 12% of the 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.

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 can be quite variable. Average precipitation at the north end of the project area at Portal is 20.95 inches; precipitation at Rodeo, New Mexico east of the project area averages 12.14 inches. There are no surface water flow gauging stations in the vicinity of the project area.

Environmental Consequences

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 28). No new diversions or wells are proposed. New water sources will originate from existing storage facilities.

Wilderness

Affected Environment

Approximately 3,000 acres of the 87,700 acre Chiricahua Wilderness are located within the Upper Price pasture on the Price Canyon allotment. With the exception of an estimated 100 acres located near Price Spring, the wilderness area contains lands considered not capable for grazing. Very little livestock use occurs within the wilderness; steep topography, dense vegetation and the lack of available water limit use to the fringe of the wilderness area. Forest Plan direction limits livestock utilization within wilderness to 35%. Recent monitoring (PR 12) indicates that use on approximately 100 acres within the wilderness averages 35-45% in some years. The Jackwood Allotment is entirely outside of the designated wilderness.

Environmental Consequences

Under *Alternative 1*, no effects to wilderness would occur. Under *Alternative 2*, grazing effects to wilderness resources will be confined to approximately 100 acres in the vicinity of Price Spring. Under the proposed action, moderate stocking and active utilization monitoring would be used to keep use within established limits. If problems are identified, management will be changed to reduce use to acceptable levels.

Heritage Resources

Affected Environment

Heritage resources (also called “cultural resources”) include a variety of archaeological and historical sites. The Chiricahua Ecosystem Management Area (EMA) has a long history of human occupation and land use. Native American occupation of the lower elevations of the Chiricahua Mountains and the adjacent valleys was quite intensive, although relatively few sites have been reported within the Forest. Pre-European contact

habitations are present in both Price and Jack Wood Canyons, although in both cases, these sites are concentrated on private in-holdings (successful homesteads from the early 1900s).

Historically, the Chiricahua EMA was within the territory of the Chiricahua Apaches who were the primary inhabitants until 1876 and a strong influence for another decade. Euro-American land use was minor until the 1880s. At that time livestock grazing increased dramatically reaching a peak in the early 1890s.

A total of 18 heritage resource sites have been reported on the two allotments. Slightly over 1000 acres, or less than 4 percent of the total area, has been subject to previous archaeological surveys. Much of the unsurveyed area is made up of steep mountainous terrain where site probabilities are low. Sites are predominantly of Native American origin and include several petroglyph sites in Jack Wood Canyon, two habitation sites, and four roasting pits. None of the sites is listed on the National Register of Historic Places, though for management purposes, all are considered eligible for the Register. Presently, archaeological 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.

Environmental Consequences

Construction of range improvements can directly damage artifacts or structures and alter their spatial relationships, while also encouraging concentration of livestock in the vicinity of the improvements. Concentration of livestock on archaeological and historical sites can also result in damage to artifacts and structures, and alteration of their spatial relationships. These impacts can compromise various aspects of the integrity of historic properties and diminish their research and interpretive potential.

Under Alternative 1, no direct or indirect effects from livestock grazing on heritage resources would occur following removal of cattle from the allotments. Alternative 2 would authorize continued grazing and two structural improvements (two pipelines). The two proposed improvements were surveyed for heritage resources; no heritage sites were found in the area of potential effect. Mechanical thinning of manzanita would also be authorized to be conducted as a multi-year undertaking as funding is available. Because this is a multi-phase project, not all proposed areas of mechanical thinning have been surveyed for heritage resources. NHPA compliance for such projects will conform to the Standard Protocol for Rangeland Management developed pursuant to Stipulation IV.A of the Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities (PR 43). Under this protocol, range improvements and other ground-disturbing activities will be analyzed for effects to heritage resources prior to implementation. Implementation of these mitigation measures would insure that there would be no adverse effects to heritage resources as the result of new range improvements.

A heritage resources report was prepared with a finding of No Adverse Effect and submitted for consultation with affected tribes and the Arizona State Historic

Preservation Officer (SHPO). Arizona SHPO concurrence was received on April 15, 2008.

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 (farming and ranching) accounted for 3.3% of the economy in 2000 (University of Arizona 2005). Ranching operations in the area tend to be characterized by small profit margins with the need for off-ranch supplemental income to continue operations.

The economic effects of the proposal were not identified as a key issue for the analysis. Nevertheless, the economic considerations of the alternatives can be compared in terms of the costs of implementation, the costs and revenues to the permittees and the return to the Federal government through grazing permit receipts. Costs and benefits are incurred by both the Federal government and the permittees, and not all participants recover their costs. Specific operating costs and revenue estimates are not available for the allotments, and weather, market conditions and business and management decisions will affect net revenue on an annual basis. In addition, the holders of the Jackwood allotment have extensive non-forest holdings that likely contribute to ranch income and the Price Canyon Ranch derives additional income from a guest ranch operation.

Environmental Consequences

Decisions relative to livestock grazing on individual allotments primarily affect 1) the permittees, who pay grazing fees and receive economic returns on their investments in livestock grazing and who contribute funds for the construction of range improvements, and 2) the Forest Service, which collects grazing fees and expends grazing receipts and appropriated tax dollars to construct improvements and to administer the allotments. Local communities may also benefit indirectly from the sale of goods and services associated with ranch operations, but given the size and economic diversity of Cochise County, a decision to authorize or not authorize grazing on the allotments would not be expected to noticeably affect economic conditions in the region. The analysis does not include certain costs or benefits incurred by the alternatives, such as costs and benefits relating to recreation opportunities, environmental quality, etc. Data to analyze these costs and benefits are not available at the allotment level; analysis at the District or Forest level is beyond the scope of the decision.

Revenues. Net ranch income represents gross returns minus operating costs. Specific operating costs and revenue estimates are not available for each ranch, and weather, market conditions and management decisions will affect net revenue on an annual basis. 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 30). Combined, the allotments are permitted for 393 animal unit years (\$23,580-\$39,300 in net income

under maximum currently permitted use). Termination of the grazing authorizations is therefore likely to have significant economic effects on the individual permittees. Although they would no longer pay grazing fees or expend money to maintain the allotments or construct improvements, the permittees would not have access to forage on federal lands with which to generate income from livestock production.

Annual grazing receipts¹⁰ to the Forest Service would vary from zero under *Alternative 1* to approximately \$6,400 under maximum allowable use on both allotments under *Alternative 2*. Typically, 25% of these receipts are returned to the Forest in the form of Range Betterment Funds used to construct range improvements. These funds (approximately \$1,600/year) would, in theory, not be available under *Alternative 1*.

Costs. In general, *Alternative 1* would have the lowest cost as neither the Forest Service nor the permittees would expend money for new improvements 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. Under *Alternative 2*, some structural range improvements have been identified as possible practices to improve livestock distribution and optimize management. Although not all improvements may be constructed, the costs would clearly be greater than under *Alternative 1*. Forest Service funding levels would require these projects to be phased in over a number of years, unless permittees are willing to bear an additional share of the costs or pursue alternative funding such as grants.

One comment on the proposed action (PR 47) indicated that the Price Canyon Ranch directly supports 12 jobs. The comment did not indicate the nature of these jobs (whether they are directly involved in the ranching operation as opposed to the guest ranch operation). The proposed action would not be expected to affect ranch employment because the proposal continues current management. Whether the no action alternative would affect employment would depend on the nature of the jobs and future decisions of the ranch owner.

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. The memorandum from the President to heads of departments and agencies that accompanied the Executive Order states that “each Federal agency 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].”

¹⁰ Estimates based on the 2008 grazing fee of \$1.35/AM. Actual receipts would vary somewhat based on changes in the grazing fee.

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.

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. 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. Monitoring of rangeland by the Forest Service and the permittee should lead to early identification of other 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 dispersed camping areas. There are no developed campgrounds, nor are there plans for future development. There are several trails and a few miles of roads in the allotments. Use on these roads will

continue to have localized effects on watershed condition, but the proposed action will not contribute significantly to existing levels of disturbance.

Portions of the area show evidence of trailing by undocumented aliens and/or drug traffickers. The effects of these activities include accumulations of trash, creation of wildcat foot 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. The proposed action is not expected to contribute adversely to the existing level of effects resulting from these activities. Comments on the proposal suggested that the presence of active ranching would serve to disrupt illegal 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.

Management-related actions 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. Mechanical reduction of woody fuels would be expected to reduce the risk of catastrophic fire and allow the re-establishment of a more natural fire regime.

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.

CONSULTATION AND COORDINATION

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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. Several individuals not identified specifically below also participated in this process.

FEDERAL, STATE, AND LOCAL AGENCIES:

Arizona Game and Fish Department USDI Fish and Wildlife Service
 Arizona Department of Agriculture
 Arizona Department of Environmental Quality
 Arizona Cooperative Extension Service
 USDA Natural Resource Conservation 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
 Western Watersheds Project The Center for Biological Diversity
 Wild Earth Guardians Arizona People for the USA

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