United States
Department of
Agriculture

Forest
Service

November 2008

Environmental Assessment

Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs Allotments

Douglas Ranger District, Coronado National Forest
Cochise County, Arizona

Township 16 South, Range 23 East, Sections 26-28, 32-35
Township 17 South, Range 23 East, Sections 1-34, 36
Township 17 South, Range 24 East, Sections 29-32
Township 18 South, Range 23 East, Sections 1-25, 36
Township 18 South, Range 24 East, Sections 5-8, 27-34

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CHAPTER 1 – PUROPOSE AND NEED

Background

This Environmental Assessment (EA) describes a Forest Service proposal to authorize grazing on the Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs allotments in the Dragoon Ecosystem Management Area (EMA), 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 Section 504 of the Rescission Act (P.L 104-19, 1995). Supporting documentation for this analysis 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 53)" would indicate that a specific passage in the EA is linked to information contained in document No. 53 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 Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs 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*).

- Changes in management are necessary to improve soil condition and vegetation ecological condition in some areas.

Existing Condition

The grazing allotments are located in the Dragoon Mountains (Figures 1 and 2). Elevations range from approximately 4,500 feet to over 7,000 feet on the crest of the mountain range. Lower elevations support desert grasslands. At middle elevations, the grasslands transition into broadleaf evergreen woodlands and chaparral. Higher elevations support a plant community dominated by coniferous woodlands. There are numerous drainages in the project area, some of which support small areas of riparian vegetation. There are no perennial streams and permanent water is limited to a handful of springs and seeps and existing livestock water developments.

Over the past century, fire has been largely absent from the landscape in the project area due to such factors as year-long continuous grazing and active fire suppression. As a result, woody shrubs and half-shrubs such as snakeweed and mesquite have increased in lower elevation grasslands. Lehmann lovegrass (*Eragrostis lehmanniana*), an exotic grass widely seeded during the 1960s, dominates the herbaceous component of the lower elevation grasslands in the Dragoon Mountains. Although this species provides ground cover and acceptable livestock forage, its presence in the community tends to affect estimates of ecological condition.

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 **Noonan** allotment is located in the eastern face of the Dragoon Mountains in the Willcox Playa watershed. There are twelve pastures, divided by fences in the lower country and by natural barriers in the higher elevations. The pastures are used in a deferred rotation through the winter and spring. Summer growing season rest occurs every year. Range vegetation conditions are static or improving. Upland vegetation condition data collected in 2006 indicate the majority of the capable acres are in fair to good range condition. Lehmann lovegrass is widespread at lower elevations throughout the allotment. Riparian conditions in Noonan Canyon are meeting Forest Plan standards. Soils were assessed most recently in 2006. Fifteen percent of the allotment, primarily low flat sites, shows indications of soil impairment. Compaction, erosion, lack of vegetative ground cover and changes in the plant community have been identified as contributing to soil impairment at these sites. The primary issue on the allotment is the need to reduce use in flat areas near the forest boundary where impaired soils occur.

The **Halfmoon** allotment is located on the northeastern face of the Dragoon Mountains in the Willcox Playa watershed. The allotment consists of four pastures used in a deferred rest rotation. Under proper management, cattle are rotated through three of the four pastures each year while the fourth is rested. However, livestock water is currently limited to one reliable well. As a result, distribution has been poor and stocking has been reduced in recent years because not all pastures could be utilized. Rangeland vegetation condition was assessed in 2006. The majority of the allotment is in fair to good condition with a static trend, although a large zone of heavy use and poor range condition is found

in the vicinity of the one reliable water. Impaired soils are found on 24% of the allotment, primarily in lower elevation sites and around the water source. There are no riparian areas on the allotment. A production/utilization study was completed in 2007. The results of this study, coupled with vegetation and soil condition data indicate that the allotment under current conditions cannot support the current permitted use. The ranch associated with this allotment was sold in 2007 and is now under new management. Cattle were removed in 2007 and as of spring 2008 the allotment has not been re-stocked.

The **Fourr** allotment is located west of the Halfmoon allotment on the western face of the Dragoon Mountains in the Upper San Pedro River watershed. The allotment consists of two pastures grazed during the winter. Cattle rotate through the upper pasture during the first part of the grazing period, and then move to the lower pasture later in the winter. Rangeland vegetation was assessed in 2006 and determined to be good to excellent with a static trend. Soils are 100% satisfactory. Major drainages include Fourr and Jordan canyons. There are no significant management issues identified on the allotment.

The **Slavin** allotment is located on the western face of the Dragoon Mountains in the Upper San Pedro River watershed. The allotment consists of four pastures that are used in a deferred rotation during the winter and spring. The allotment is not grazed during the summer growing season. Rangeland vegetation was assessed in 2006 and determined to be in fair condition with a static trend. The extensive presence of Lehmann lovegrass has changed the composition of the perennial grass community and results in lower than expected vegetation condition on the allotment. However, indicators of watershed health such as litter and bare ground are good. Soils are 100% satisfactory. West Stronghold Canyon and Slavin Gulch both have a good representation of riparian obligate species, generally good bank protection, and stable channels. Production/utilization studies were completed in 2007. These data, combined with condition and trend data, indicate that stocking is balanced with capacity. There are no significant management issues identified on the allotment.

The **Granite Springs** allotment is located in the southwest corner of the Dragoon Mountains in the Upper San Pedro River watershed. The ranch is operated under a Coordinated Resource Management Plan between the Forest Service, the State of Arizona, the Natural Resources Conservation Service and the permittee. There are eight pastures on the forest. A single herd is rotated through the forest and four additional non-forest pastures in a deferred-rest rotation. The allotment can be used any time of the year, but because the allotment is managed in combination with other lands, actual use and occupancy averages about six months per year. Ecological condition data were collected in 2006. Resource conditions are considered stable or improving, although vegetation condition on some sites was rated poor due to the extensive presence of Lehmann lovegrass. Monitoring in 2006 showed significant increases in litter and decreases in bare ground, indicating improving watershed condition. Soil condition is 99% satisfactory. The goal of the permittee is to improve pasture reliability by continuing to develop more dependable waters.

The **Reppy** allotment is located at the south end of the Dragoon Mountains in the Upper San Pedro River watershed. The allotment consists of a single pasture that is used in conjunction with adjoining state and private land. Most capable rangelands are found in the southwest corner of the allotment. There is no fence on the southern boundary of the

allotment and only one reliable water located on the forest. Thus cattle are free to move on and off of the forest. Ecological conditions are considered fair with stable trends, based on monitoring in 2006. As with the other allotments in this group, Lehmann lovegrass dominates large areas of the allotment. Soils are considered to be 100% satisfactory.

The **Walnut Springs** allotment is located in the southeast corner of the Dragoon Mountains in the Willcox Playa watershed. There are two pastures. Cattle rotate between the two pastures yearlong in a deferred rotation with growing season rest occurring periodically in each pasture. Range condition data collected in 2006 indicate that the majority of capable acres are in fair condition with stable or upward trends. The presence of Lehmann lovegrass has changed the composition of the plant community and accounts for lower than expected range condition in some sites. Soil condition data indicate that impaired soils occur on approximately 12% of the allotment, primarily in the lower pasture. The encroachment of woody species is a concern. There are no major riparian channels on this allotment; however, a small riparian community is present at Goodrich Spring. The primary management issue is the need to reduce use in areas where soil impairment occurs.

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

Allotment	Halfmoon	Fourr	Noonan	Slavin	Granite Springs	Reppy	Walnut Springs
Total Acres	6,891	3,628	5,382	11,055	6,887	2,792	2,882
Capable Acres	3,875	1,920	3,400	4,713	4,890	1,475	2,530
Permitted Use	100 cows	117 cows	256 cow/calf	130 cow/calf	117 cow/calf	40 cow/calf	76 cows
Season of Use	Yearlong	11/1-4/30	11/16-5/16	12/1-5/31	Yearlong	Yearlong	Yearlong
AUMs[1]	1200	702	2,028	1,030	1,853	634	912
Animal Months	1200	702	1536	780	1404	480	912
Recent use in animal months (No. of cattle X No. of months use)							
2002-2003	850	504	845	240	1332	480	398
2003-2004	non-use	477	776	no data	519	480	200
2004-2005	48	293	751	60	799	480	non-use
2005-2006	186	330	non-use	50	1049	non-use	non-use
2006-2007	684	132	973	780	1062	non-use	580

[1] 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.

Management Direction

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

Management Area (MA) 1 includes steep, rugged lands that are managed for visual resources and semi-primitive dispersed recreation (Forest Plan p. 47). Slopes are generally in excess of 40% and sites included in this management area are generally considered unsuited for livestock grazing. Range management standards and guidelines call for no assigned permitted use for livestock. Cattle may occasionally use these areas (they are not physically excluded), but they are not used to calculate grazing capacity. Within the project area, MA 1 includes cliff faces and steep rocky peaks along the crest of the range.

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). Lower and mid-elevation uplands throughout the Dragoon EMA fall within MA 4.

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). West Stronghold Canyon and Slavin Gulch on the Slavin allotment and the Granite Springs drainage are designated as MA7.

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.

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. Methodologies that will be used to determine achievement of the objectives are described in the Proposed Action under *Monitoring* in Chapter 2.

- 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. Achievement will be monitored through implementation monitoring described under the proposed action.
- Ecological sites within the 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. Achievement will be monitored through effectiveness monitoring described under the proposed action.
- 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. Achievement will be monitored through effectiveness monitoring described under the proposed action.
- 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. Achievement will be monitored through implementation effectiveness monitoring.
- Areas with impaired soil condition have increasing ground cover and litter and little erosion. Achievement will be monitored through soil condition and ground cover (effectiveness) monitoring.
- Occupied habitats for threatened, endangered, sensitive and management indicator species are maintained or improved and recovery objectives are being met. Achievement will be monitored through surveys and occurrence records, implementation and effectiveness monitoring.
- All grazing improvements necessary for management on all allotments are in proper working order and are contributing toward improved livestock distribution and pasture reliability. Achievement will be monitored through implementation monitoring and facility inspections.

Proposed Action

The Forest's proposed action is to authorize managed livestock grazing on the Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs 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. 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 Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs 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 October 2007. The proposal was provided to the public and other agencies for comment during scoping in January and February, 2008 (PR 43). Four comment letters were received in response to scoping (PRs 44-47). In addition, the agency has met several times with permittees on the allotments to identify management objectives and strategies. Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address (PR 48).

In August and September 2008, a draft of the EA (PR 64) 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 August 19, 2008. One comment letter was received in response to this solicitation (PR 66, 68).

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.[2] An analysis of the issues and scoping responses is included in the Record as PR .

Key Issues

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

Other Issues

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

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

Soil and watershed condition – 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.

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

[2] 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)…"

CHAPTER 2 - ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered for the management of the Noonan, Halfmoon, Fourr, Slavin, Granite Springs, Reppy and Walnut Springs allotments. This section presents the alternatives in comparative form, in order to define the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Mitigation and monitoring measures incorporated into the alternatives are also described.

Alternatives

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 does not meet the purpose and need to manage resources in a manner that achieves Forest Plan objectives and desired conditions in the project area, nor would it increase management flexibility through formal implementation of adaptive management.

Alternative 1

No Action

Under this alternative, grazing would not be authorized and use of the allotments by domestic livestock would be discontinued. Permittees would be given up to one year from the date of the NEPA-based decision to remove livestock from the allotments. 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 Halfmoon, Fourr, Noonan, Slavin, Granite Springs, Reppy and Walnut Springs allotments with modifications to address identified management issues. The proposed action consists of four components - authorization, improvements, management practices and monitoring – and would be implemented using an adaptive management strategy.

1. Authorization

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

- **Duration and timing of grazing.** Grazing would be authorized on each allotment using rotational or seasonal grazing in order to incorporate growing season rest or deferment to allow for grazed plant recovery. Pastures grazed during the summer growing season (July-September) will not be grazed during the growing season the following year. On all allotments, the sequence and timing of pasture moves and entry and exit from the allotments would be based on monitoring of range readiness, ecological condition, water availability and utilization.
- **Intensity of grazing.** Forage utilization would be managed at a level corresponding to light to moderate intensity[3] 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 utilization in excess of 45 percent 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.

The following administrative actions would be necessary to implement the 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 total animal unit months (AUMs[4]) authorized for each permit. The

[3] Based on review of numerous grazing intensity studies, Holechek (2004) identifies light to moderate grazing as 32-43 percent average use of primary forage species. These averages are based on pasture-wide utilization averaged over time. The Forest Service monitors utilization based on the use of key forage species in key areas. Key areas are selected to be representative of management effectiveness over the entire pasture. For the purposes of monitoring, an annual use guideline of 30-45 percent 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 percent.

[4] 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

number and class of livestock and season of use would be allowed to vary depending on resource conditions and management objectives. Resource conditions that would affect management decisions include but are not limited to precipitation, forage production, water availability and previous annual or seasonal utilization levels. Annual use will not exceed the total AUMs authorized or the season of use identified in the permit. Changes will be documented and authorized annually in the annual operating plans. Grazing permits would be issued within 90 days of final agency action following the NEPA decision to authorize grazing [FSH 2209.13(94) and R3 Supplement 2209.13-2007-1].

- **Noonan:** 215 cow/calf pairs or equivalent, October 15 to April 15 (up to 1703 AUMs).
- **Halfmoon:** 63 cow/calf pairs or equivalent yearlong (up to 1000 AUMs). Initial stocking will not exceed 75% of permitted use (47 cow/calf pairs or equivalent) until additional water sources can be provided to improve distribution.
- **Fourr:** 88 cow/calf pairs or equivalent yearlong (up to 700 AUMs) Grazing may occur in any month, but use and occupancy on the Forest will not exceed 6 months per year.
- **Slavin:** 130 cow/calf pairs or equivalent yearlong (up to 1030 AUMs). Grazing may occur in any month, but use and occupancy on the Forest will not exceed 6 months per year.
- **Granite Springs:** 117 cow/calf pairs or equivalent yearlong (up to 1853 AUMs). Three horses yearlong (43 AUMs) would also be authorized.
- **Reppy:** 40 cow/calf pairs or equivalent, yearlong (up to 634 AUMs).
- **Walnut Springs:** 76 cow/calf pairs or equivalent yearlong (up to 1003 AUMs). Grazing would be authorized yearlong and may occur in any month, but use and occupancy of the Forest would not exceed 10 months per year.

- **Allotment Management Plans.** New allotment management plans (AMPs) for each allotment would be developed (or modified where existing AMPs are in place) concurrent with new permits. These would be included as part of the grazing permits. 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

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.

management plans[5] (CRMPs) will continue where in place and such management will be encouraged where the presence of intermingled ownership is conducive to more flexible and efficient management.

- **Annual Operating Plans.** On an annual basis, the Forest and permittees would 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.

2. Improvements

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).

Several new structural improvements are proposed in order to improve livestock distribution and pasture reliability. These improvements 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. Additionally, current levels of Forest Service funding are likely insufficient to fund all projects identified. Permittees have been notified that it may be necessary to pursue alternative sources of funding in order to accomplish identified projects.

Noonan

- Drill a well in the north end of Middle pasture and install pipelines to the Prude and Shield pastures, and to the middle of the Middle pasture. Storage and troughs will be

[5] Coordinated resource management is the process by which various users and agencies cooperate to manage a variety of resources across multiple jurisdictional boundaries, which allows for a landscape level management and involvement of a variety of stakeholders.

installed at the terminus of each pipeline. All pipelines will be buried. (T17S, R24E, Sec. 30).

Halfmoon

- No new improvements are proposed, but existing water sources need to be maintained or repaired in order for the allotment to be used effectively.

Fourr

- No new improvements are proposed.

Slavin

- New water storage and drinkers will be placed on private land adjacent to the Forest to water lower portions of the Slavin and Packard pastures. Access will be provided to cattle grazing on the Forest. (This will be a privately funded activity, but is included in the analysis because it is expected to change livestock distribution and use on the Forest.)
- Extend an above-ground pipeline from the new Slavin pasture water, described above, approximately ½ mile east into the Slavin pasture interior. (T18S, R23E, Sec. 7)
- Drill a new well in West Stronghold Canyon and install a pipeline approximately ½ mile from the well to the interior of the Stronghold pasture. (T17S, R23E, Sec. 29)

Granite Springs

- Reroute short sections of the Horse Pasture pipeline to service troughs in Horse pasture and Windmill pasture to the west. (T18S, R23E, Sec. 21, NE ¼)
- Cross fence Dirt Tank pasture and Windmill pasture. This would increase pasture rotation flexibility and provide additional opportunities for pasture deferment by increasing the number of pastures in the rotation. (T18S, R23E, Sec. 19, 20, 21)

Reppy

- Install a pipeline from Bennet Dam downstream to a storage tank and drinker. (T18S, R23E, Sec. 36, NE ¼)
- Convert the existing well and storage at Henry well to a rainwater catchment (trick tank). (T18S, R23E, Sec. 25, NE ¼)

Walnut Spring

- Drill a well in the northeastern portion of the Upper Forest pasture and install storage and a drinker (T 18S, R24E, Section 28, SE 1/4). A pipeline would run from the well east into the northwest corner of Lower Forest pasture to supply a drinker.
- Fence Neely Spring and its associated storage tank. Water would be piped to an adjacent drinker located outside the riparian area. (T18S, R24E, Section 34, SW ¼)

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, PR 63) 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.

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.
- The Forest will implement the Forest's Stockpond and Aquatic Habitat Management and Maintenance Guidelines for the Chiricahua leopard frog (*Rana chiricahuensis*) (PR 41). The objectives are 1) to minimize short-term impacts to frogs while allowing maintenance activities that maintain occupied habitats, and 2) to protect shoreline and emergent vegetation and to improve water quality.

- Neely Spring (Walnut Springs allotment) would be fenced to protect suitable leopard frog habitats.

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 structural 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 heritage sites. If unrecorded sites are discovered during the course of project implementation, activities will cease and the Forest or District 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.

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 Reference (1996a), the Region 3 Rangeland Analysis and Training Guide (USDA Forest Service, 1997), and the Riparian Area Survey and Evaluation System (USDA Forest Service, 1989). 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 five to ten year intervals, or more frequently if deemed necessary. Examples of effectiveness monitoring include, but are not limited to dry weight rank, pace transects, pace quadrat frequency, Parker 3-step, riparian evaluations (RASES or proper functioning condition), soil and watershed condition assessments and repeat photography. Monitoring will occur at established permanent monitoring points.

Implementation monitoring will occur yearly and will include such things as inspection reports, forage utilization measurements, livestock counts, Grazing Response Index and facilities inspections. Utilization measurements are made following procedures found in the Interagency Technical Reference on utilization studies (1996b) and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands (Smith et al, 2007, PR 38).

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 areas[6], 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. Utilization may be monitored both during the grazing season (seasonal use) and at the end of the growing season (annual utilization).The Douglas District Range Staff Officer and the permittees will be responsible for monitoring livestock grazing utilization. Over time, changes in resource conditions or management may result in changes in livestock use patterns. As livestock use patterns change, new key areas may be established and existing key areas may be modified or abandoned in cooperation with the permittees.

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

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.

[6] 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.

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. Begins to resolve distribution issues and balances use with capacity. Provides management flexibility.
Effect on Wildlife and Plants	No Effects from grazing.	Effects mitigated. Improved distribution and moderate use 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.
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 presented in the chart above. The section is organized by resource. Within each section, the affected environment is briefly described, followed by the environmental consequences (effects) of implementing each alternative.

Past, present and future activities identified for consideration of 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. No additional activities that would affect resources in the project area are listed in the Forest's June 2008 Schedule of Proposed Actions. Other possible future actions are considered too speculative to include in this analysis.

Historic uses. Livestock grazing has occurred within the analysis area for over 100 years (Bahre 1985). 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 introduction of exotic grasses, most notably Lehmann lovegrass, has resulted in the displacement of native perennial grasses in some sites. 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.

Mining activity occurred within the area from the mid 1800's into the 1960's. The effects of historic surface and underground mining is still in evidence, primarily in the form of disturbed soils. At the turn of the 20th century, the mountains were extensively logged to provide fuelwood for mines and mills in nearby Tombstone and other towns. The depletion of fuelwood was the major incentive for the creation of the Dragoon National Forest in 1907.

Human Activities. Authorized activities in the project area include camping, hiking, hunting, wildlife watching and vehicle use on surfaced and unsurfaced roads. Impacts from these activities are short term and primarily consist of minor ground disturbance in popular camping areas and minor wildlife disturbance. There are no developed

recreational facilities (campgrounds and picnic areas) in the project area (a campground is located in Cochise Stronghold outside of the area). Private land inholdings are scattered throughout the area. Uses on these lands are largely rural and many are managed as part of ongoing grazing operations.

The Dragoon Mountains receive use by undocumented immigrants, smugglers and associated law enforcement and interdiction efforts (primarily U.S. Border Patrol). Individuals involved in these activities create trails and campsites which result in localized soil disturbance. Abandoned warming fires have been known to cause wildfires in other locations on the forest.

Wildlife

Threatened and Endangered Species

Effects of the ongoing grazing activities on the allotments have been previously evaluated in Biological Assessments (BA) of Ongoing and Long-term Grazing on the Coronado National Forest in 1998 and again in 2002 (USDA-FS 1998, 2002, PR 40). The effects of continued implementation of the Forest Plan, including livestock grazing, were evaluated in 2005 (USDA-FS 2004, 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 (PR 40). 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 (PRs 55, 56). Species potentially affected by the proposed action or alternatives are disclosed below. More extensive discussions, including “no effect” determinations, can be found in the project BA (PR 55).

Chiricahua Leopard Frog (*Rana chiricahuensis*) (CLF)

Currently, the only known extant population of CLF in the Dragoon Mountains is on the Middlemarch Allotment, outside of the project area. Adult, larvae (tadpole) and egg masses of the CLF were recorded at Goodrich Spring and Majo Spring in the Walnut Springs allotment between 1993 and 1997, but have not been recorded since (AGFD records). Goodrich Spring and the riparian area below the spring were fenced in 1995 to exclude livestock. No CLF populations or suitable habitats have been identified on the other allotments in the analysis. Suitable habitats were surveyed in 2006 and 2007 (PR 42).

There are four springs on the Walnut Springs allotment with potential habitat for CLF. Two sites – Goodrich Spring and Majo Spring – have periodically gone dry due to extended drought conditions, and a third site at Walnut Spring has receded to a shallow pool inside a concrete spring box (PR 42). Neely Spring has continued to provide a reliable source of water through the drought. Although the other springs appear to no longer be reliable habitat for CLF, each riparian zone has rehabilitation potential and can serve as key components of this species’ continuance or re-establishment in the Dragoon Mountains.

Chiricahua leopard frog populations are often small and their habitats are dynamic, resulting in a relatively low probability of long-term population persistence. When

populations are relatively close together and numerous, extirpated sites can be recolonized (USFWS 2002). The Walnut Springs allotment is adjacent to the Black Diamond Allotment and Middlemarch Allotment, both of which support or recently supported CLF. The Arizona Game and Fish Department (AGFD) has identified three sites on the Black Diamond allotment for re-establishing CLF through transplants. Given the distance (≥1.6 miles) and rough intervening terrain between these sites and suitable habitat on the Walnut Spring Allotment, there is low potential for CLF to naturally reoccupy the Walnut Springs allotment.

As part of the proposed action for the Walnut Springs allotment, the Forest will continue to implement the terms and conditions of the 2002 BO through the Forest Chiricahua leopard frog habitat maintenance guidelines (PR 41 and proposed action, above). Continued implementation of these measures should insure detection of any extant frogs and insure maintenance of suitable habitats. Existing livestock grazing exclosures at Goodrich Spring and Walnut Spring and the proposed exclosure at Neely Spring will protect habitat for CLF at these sites.

Upland vegetation, soil and riparian conditions have been assessed throughout the project area and are judged to be contributing to satisfactory watershed conditions (Walnut Springs Allotment Trend Analysis, PR 28). Upland vegetation is meeting forest plan standards. Trends in watershed conditions appear to be stable or upward based on observations of increasing litter and decreasing bare ground. Best management practices and light to moderate utilization proposed are expected to maintain these trends.

The Forest has determined that the proposed grazing authorization on the **Walnut Springs allotment** *may affect, but is not likely to adversely* affect the Chiricahua Leopard Frog based on the following rationale.

- In repeated surveys by AGFD and others over the past 10 years, Chiricahua leopard frogs have not been found on the Allotment. Historically occupied habitat at Goodrich Spring was dry in 2006 and 2007.
- The Walnut Spring allotment contains suitable non-occupied habitat. Leopard frogs have not been found at these sites in over 10 years (although the surveys by species experts at AGFD were not conducted according to the survey protocol established by the CLF Recovery Plan). The potential for leopard frogs to occur on the allotment is discountable.
- Watershed conditions on the Walnut Springs Allotment are improving and/or static and are not contributing indirect effects to potential or suitable habitats.
- The Forest will continue to implement the terms and conditions of the 2002 BO through the Forest Chiricahua leopard frog habitat maintenance guidelines. Continued implementation of these measures should insure detection of any extant frogs and insure maintenance of suitable habitats.
- Two potential sites (Goodrich Spring and Walnut Spring) are currently fenced to exclude cattle; a third site (Neely Spring) will be fenced.

Lesser Long-nosed Bat (*Leptonycteris curasoe yerbabuenae*) (LLNB).

In 2002 the Forest determined that grazing as practiced on the seven allotments may adversely affect the LLNB because flowering agaves (*Agave parryi* and *A. palmeri*) would be exposed to livestock grazing, thereby potentially affecting the food supply for the bat. Take was not assessed and no terms and conditions were issued.

No maternity roosts are known to occur on the Forest but a primary LLNB roost site (greater than 50 bats, USFWS 2002) is known from the Dragoon Mountains on the Middlemarch Allotment, outside of the project area. The roost is occupied generally during the July-September, which is the post-maternity period for LLNB. Due to the proximity of the roost to the seven allotments it is assumed that LLNB forage on agave plants within the allotment boundaries.

Grazing theoretically affects the LLNB indirectly through removal of food plants either as a result of ground-disturbing livestock management activities that damage agaves, or through herbivory by livestock on agave stalks (USDI 2002). Agave stalks are rich in carbohydrates, and as they begin to bolt are particularly palatable to domestic livestock and wild herbivores. Cattle and wildlife can preclude flower development in agaves by grazing the emerging flower stalk. Differences in the number of agave eaten between grazed and ungrazed areas have been reported. For example, Widmer (2002) and Mann (2005) reported greater herbivory detected where livestock grazing occurred during the bolting season versus areas that were not grazed by livestock during that time period. Other researchers observed that the proportion of flower stalks broken did not differ significantly between grazed and ungrazed areas (Bowers and McLaughlin 2000). Because bolting agaves are often heavily used by wildlife, especially deer, Widmer (2002) concluded that removing cattle during the bolting season does not necessarily ensure a significantly lower level of herbivory. In addition, Widmer found that livestock herbivory on agaves diminished significantly at distances greater than 1.21 km (0.75 mi) from water. Thus, many remote (from water) agave populations are likely to be unaffected by livestock grazing, regardless of the season of use.

On the Forest agave transects in the nearby Huachuca EMA, we observed high rates of herbivory in both grazed (65 percent) and ungrazed (73 percent) transects (USFS 2007, PR 58). The extent of livestock use of agave flower stalks may be related to standing biomass and distance from water (Widmer 2002). We observed the highest rates of herbivory in 2006 following a relatively dry winter season.

The Forest has determined that the proposed grazing authorizations *may affect, but are not likely to adversely* affect the LLNB on all allotments based on the following rationale.

- Approximately forty percent of the project area is non-capable (steep, high elevation) rangelands that support agave populations but are not grazed to a significant degree. Elsewhere, grazing may occur during a portion of the agave bolting season in selected pastures in each allotment, although deferment and rest periods proposed will assure that not all pastures are grazed in a given year.
- Monitoring in both grazed and ungrazed sites is inconclusive with respect to the effects of livestock grazing on agave flowering. It has not been

demonstrated that existing levels of herbivory significantly affect agave densities either at the local or forest-wide scale or that agave densities are a limiting factor for LLNB.

- Where livestock herbivory occurs, research indicates that effects cannot be discerned at distances greater than 0.75 miles from water. Thus, effects of livestock grazing on agaves in the project area would be limited to the vicinity of a relatively few permanent water locations.
- Mitigation is in place to minimize the destruction of agaves as a result of construction activities. Prior to implementing a proposed range improvement project, a site survey is conducted to identify agave concentrations, evaluate the potential impacts to agave plants, and develop mitigation measures to minimize loss of agaves due to construction activities.
- No roosts are known from the project area and no effects to known roosts are anticipated.
- During drought periods, the Forest implements its drought policy (PR 70) to insure reduced utilization during periods when standing forage biomass is reduced.

Jaguar (*Panthera onca*). There are no state accepted sightings from this mountain range. Jaguars have been documented within the past ten years in the Peloncillo Mountains some 60-plus miles southeast of the project area. Suitable habitats are present in the Dragoon Mountains in the form of rough remote canyons and ridges. The proposed action would not affect these habitats. No Effect (PR 55).

Mexican Spotted Owl (*Strix occidentalis occidentalis*). A single owl has been recorded from Cochise Stronghold outside of the project area on the Middlemarch allotment (2005). There are no protected or restricted habitats identified within the EMA, nor is critical habitat designated. No Effect (PR 55).

Forest Service Sensitive Species

Forest Service Sensitive species are those species 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). Sources used to identify these species included 1) 2007 Regional Foresters list[7], 2) records available through the Arizona Game and Fish Department's Heritage Data Management System, and 3) Forest Service project files. Many species are on the Forest Service's Regional Sensitive Species list because their distribution and habitat requirements are poorly known, but are thought to be rare. Their presence or absence within the project area is inferred because suitable habitats are present. Effects to sensitive species have been analyzed in a biological evaluation prepared for this project (PR 57) and are summarized below.

[7] Source: Regional Forester's Sensitive Species List of Plants and Animals, October 1, 2007.

For the following species, a Forest Service Biologist has determined that the proposed action *may affect individuals, but is unlikely to result in a trend toward federal listing or a loss of viability.*

Mexican long-tongued bat (*Choeronycteris mexicana*). The Mexican long-tongued bat is an agave nectar-feeding bat that is ecologically similar to the lesser long-nosed bat. They are found in mesic areas of canyons of mixed oak-conifer forests and most records are from over 4,000 feet elevation. Caves and abandoned mines are favored as roosts. Population trends are unknown (AGFD 2006). Threats include recreational caving, mining, mine reclamation and loss of riparian habitat. Activities that remove significant numbers of agaves could affect the bat's food source.

No roosts are known from the project area. Furthermore, the proposed action includes mitigation that would avoid disturbance of bat roosts. The potential effects of grazing on agave populations are inconclusive and are described above under *lesser long-nosed bat*, above. The proposed action would be expected to result in some herbivory on agaves by livestock, but pasture deferments and the inaccessible nature of much of the project area would limit effects to agaves.

Giant spotted whiptail (*Cnedmidophorus burti stictogrammus*). This species of whiptail lizard inhabits mountain canyons, arroyos, and mesas in arid and semi-arid regions, entering lowland desert along stream courses. It is found in dense shrubby vegetation, often among rocks near permanent and intermittent streams. Open areas of bunch grass within these riparian habitats are also occupied (AGFD 2001). The loss of cover could affect the species and potentially its prey base. However, light to moderate grazing as proposed is unlikely to significantly reduce cover. Direct effects potentially include disturbance of individuals during range construction projects or trampling by livestock, which is considered unlikely.

Slevins bunchgrass lizard (*Sceloporus slevini*). This lizard is found in several mountain ranges in southeastern Arizona, including the Dragoon range. It is found mainly above 6,000 feet elevation in sunny patches of bunchgrass in open coniferous forests. The AGFD describes it as "thriving at many localities within a very limited Arizona range" (AGFD 2003). There are no known ongoing threats to populations in Arizona. Grazing as proposed would result in minor modification of bunchgrass communities, but light to moderate utilization and regular growing season rest would allow for retention of herbaceous bunchgrasses.

Trans-Pecos Indian Paint Brush (*Castilleja nervata*). This plant grows on rocky, south facing, grassy slopes on rhyolitic soils at elevation between 4,200 to 9,640 feet in several mountain ranges in southeast Arizona. Plants are part of a tall bunch grass community in open sun with a scattering of small trees. This plant is known from Cochise Stronghold outside of the project area allotments. If present on the allotments, this plant could be grazed because it occurs on south facing grassy slopes where cattle would graze during winter. Heavy grazing is considered a potential threat, but light to moderate levels proposed should allow the species to persist.

Arid Throne Fleabane (*Erigeron arisolius*). This plant grows in moist rocky soils within grasslands, grassy openings in woodlands or roadsides. It has not been documented in the project area, but suitable habitats are present. This annual/short lived

perennial always grows in open situations. Baker (1999) surveyed numerous locations on the Forest and considered it common and abundant over a large range. This annual plant appears tolerant of disturbance and is unlikely to be seriously affected by light to moderate grazing.

Bartram Stonecrop (*Graptopetalum bartramii*). This small succulent grows in cracks in rocky outcrops in shrub live oak-grassland on sides of rugged canyons. It usually grows in heavy litter and shade associated with water, but sometimes occurs in hot dry slopes. This plant generally grows in rocky cliff habitats not generally used by livestock. Nevertheless it sometimes grows in situations where trampling or limited grazing may occur.

Rutter's false goldenaster (*Heterotheca rutteri*). This species is dependent on healthy grassland habitats and may be vulnerable to loss of grassland. Fire may be an important management factor because it is found in habitats that historically burned frequently. The rarity of this plant is puzzling because it has many close relatives that are very weedy. This species grows in grasslands and oak savannahs, road cuts and disturbed sites at elevations between 4,500-6,500 feet. Potential habitat occurs in the project area but the species has not been recorded on the allotments. The species may be susceptible to trampling by livestock. However, the species appears to tolerate some disturbance, as it grows in and adjacent to disturbed areas.

Lemmon's lupine (*Lupinus lemmonii*). This plant is endemic to the mountains of southeastern Arizona where it occurs mostly in the Chiricahua and Dragoon mountains in open grassland, juniper and oak communities at 4,000-7,300 ft. Individual plants may be grazed by cattle at lower elevations, but moderate use levels and limited grazing at higher elevations should allow populations to persist.

For the following sensitive species, a Forest Service Biologist has determined that the proposed action will have *no impact* on the species.

Allen's lappet-browed bat (*idionycteris phyllotis*), Townsend's big-eared bat, (*Corynorhinus townsendii pallescens*), Western yellow bat (*Lasiurus xanthinus*), Greater western mastiff bat (*Eumops perotis*). All four bat species are considered together because habitat needs and effects are similar. Populations of the four species of bats potentially occurring in the project area are affected primarily by disturbance or destruction of roost sites, which are primarily caves, crevices, abandoned mines or, in the case of the western yellow bat, riparian trees. Bat roosts are found in the project area, but these are not affected by grazing. The proposed action includes mitigation that would avoid disturbance of bat roosts. Therefore, the proposed action would not affect potential bat roosts. Grazing in riparian areas would not be of sufficient intensity or duration to alter the composition or recruitment of mature riparian trees where they occur.

White-nosed coati (*Nasua narica*). This species is common in oak woodlands and riparian habitats throughout the Forest, including the Dragoon Ecosystem Management Area (EMA). 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.

American peregrine falcon (*Falco peregrinus anatum*). An active peregrine falcon eyrie is found on Rockfellow Dome in Stronghold Canyon. The project area is likely used as a foraging area for birds nesting nearby. The primary threat to the species is disturbance at nest sites, primarily by recreational rock climbers, but also through other ground-disturbing or loud activities that take place during the nesting season (March 1 to July 15). A seasonal closure has been in effect within 0.5 mile of the eyrie since 1996. No activities are planned in the vicinity of the eyrie, so no disturbance direct impacts are anticipated. Light to moderate grazing intensity under the proposed action should maintain vegetative diversity and corresponding prey species habitat quality.

Reticulate Gila Monster (*Heloderma suspectum suspectum*). This subspecies is found in desertscrub habitats, desert grasslands and the lower reaches of Madrean evergreen woodlands. The species is threatened by over-collection and loss of habitat near urban areas like Tucson, but populations and habitats in remote locations (like the Dragoon Mountains) are secure. Livestock grazing is not known to be a threat. The species spends the majority of the year underground where it is not affected by surface activities.

Huachuca giant skipper (*Agathymus evansi*). This species is known only from the Huachuca Mountains. It feeds on *Agave parryi*. It is not likely to be present in the project area and mitigation features in place should protect agaves across the landscape.

Arizona giant sedge (*Carex ultr*a). Documented occurrences of this species are found at Goodrich Spring on the Walnut Springs allotment and in Carlink Canyon on the Halfmoon allotment. The Goodrich Spring population is within a fenced exclosure and is not exposed to grazing. The Carlink Canyon population is at the head of a steep canyon that is largely inaccessible to grazing cattle.

Catalina beardtongue *(Penstemon discolor).* This perennial herbaceous shrub grows on bare soil and rock outcrops at elevations between 4,000 and 7,600 feet. This plant is an early colonizer and, as such, is tolerant of disturbance. Populations are found in the Dragoon Mountains, but in nearly vertical rock faces that are not grazed (Malusa 2001). It is unlikely that any of the known populations would be accessible to grazing cattle.

Management Indicator Species

Forest Plan direction for Management Indicator Species (MIS) is to maintain or improve occupied habitat (PRs 1, 59). Population status and trends for the species addressed in this analysis were evaluated based on the following sources: Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS), North American Breeding Bird Survey (NABBS) data from 1980-2006 (U.S. Geological Survey web site http://www.mbr.nbs.gov/bbdbbs.html), Christmas Bird Count (CBC) data (http://www.audubon.org/bird/cbc/), the Arizona Partners in Flight Bird Conservation Plan (Latta, et al 1999), Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2006) supporting documentation on file in Forest Service offices, and a wide variety of other literature related to Arizona wildlife and habitat types. Forest-wide trends of all MIS have been assessed and are reported in the Forest-wide Status Report for Management Indicator Species (USDA Forest Service 2002, PR 59). The background information and conclusions of this report are incorporated by reference. Where necessary and appropriate, the information in the Forest-wide report has been updated in the species

accounts that follow below. Other MIS on the forest were excluded from the analysis because they do not occur in the project area or they are not habitat indicators (PR 57).

Primary and Secondary Cavity Nesters

Primary cavity nesters are those species that excavate and nest in cavities, whereas secondary cavity nesters use cavities excavated by primary cavity nesters, or naturally-occurring cavities. On the Forest, cavity nesters occur primarily within forested areas including riparian habitats, Madrean evergreen woodlands, coniferous forests, and in Sonoran desert habitats that contain saguaro cactus (*Carniegia gigantea*). In general, cavity nesters require large, older age class trees and snags to provide a suitable substrate for cavities.

North American Breeding Bird Survey information for the Cavity Nester group in the Mexican Highlands physiographic region show slight but statistically insignificant declines for Ash-throated Flycatcher and Bewick's Wren. The Arizona Breeding Bird Atlas identifies both of these species as common and widespread in Arizona (Corman and Wise-Gervais 2006).

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. Much of the uplands in the project area are wooded, and dead standing snags are abundant as a result of fires in 2002 and 20003. No activities are proposed that would change the amount or distribution of cavity bearing trees in upland sites. In riparian areas, grazing potentially affects the recruitment of trees through trampling or browsing on small trees by livestock. Riparian monitoring data indicate that riparian recruitment was good, showing little effect of livestock grazing (Lefevre 2007). Pasture rest and deferment and/or growing season rest 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. Grazing as proposed is unlikely to cause a detectable change in cavity-nester populations or a loss of occupied habitat.

Montezuma (Mearns') Quail (*Crytonyx montezumae*)

Montezuma quail is included in the *Species Needing Herbaceous Cover, Game Species, and Special Interest Species* indicator groups. The 1986 Forest Plan identified 225,410 acres of occupied habitat within several vegetation types, forest-wide. This species is identified as a priority bird species in the Arizona Partners in Flight Bird Conservation Plan (Latta 1999). Overgrazing has been shown to be deleterious to Montezuma quail due to its effects on cover. The maintenance of grass height over 6" is necessary to provide sufficient cover for the birds to hide from predators (Heffelfinger and Olding 2000). Across the Forest, the amount of potential habitat has not changed significantly since 1986, but habitat suitability has likely improved as a result of improved livestock management and reductions in utilization over the past two decades.

The Dragoon Mountains are identified as secondary range for Montezuma quail by AGFD (AGFD 2005). The species potentially occurs in low densities throughout suitable

broadleaf evergreen woodland, deciduous and evergreen riparian forest habitats in the project area. Corman and Wise-Gervais (2006) reported the species as a possible breeder during the compilation of the Arizona Breeding Bird Atlas. As with many small game species, harvest data provide an index to population levels from year to year. Harvests have fluctuated widely, but are currently near the same levels they were at in the early 1980's.

In a study of the effects of human activities and habitat conditions on Montezuma quail populations from 1997 to 2000, Bristow and Ockenfels (2000) found no clear population trends in any of four study areas which included both grazed and ungrazed sites. Their study and others (Brown 1989, Stromberg 1990) suggest that population trends of this species appear to be dependent upon summer monsoon and winter rains and there may be significant population fluctuations on an annual basis. Bristow and Ockenfels (2000) concluded that grazing management as practiced on the Coronado National Forest was not significantly affecting Montezuma quail populations.

Alternative 1 (No Action/No Grazing) would maximize the amount of residual herbaceous cover that provides Montezuma quail habitat. 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). 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* should maintain sufficient levels of herbaceous cover by restricting utilization to 45% or less. Proposed changes in management that incorporate growing season rest should increase grass plant production and vigor. In summary, grazing as proposed under any of the alternatives is unlikely to cause a detectable change in Montezuma quail populations or a loss of occupied habitat.

Coues White-tailed Deer (*Odocoileus virginianus couesi*)

Coues white-tailed deer is included in the *Species Needing Diversity, Species Needing Herbaceous Cover*, and *Game Species* indicator groups. Coues white-tailed deer inhabit mixed-oak forests, semidesert grasslands, pine forests, and riparian habitats (Hoffmeister 1986). White-tailed deer tend to use hilly, mixed-oak habitats more than other types and tend to avoid open, grassy areas (Ockenfels et al. 1991). Bedding areas are often dependent on adequate thermal (canopy) and security cover. Shrubs compose over half of the yearly diet. The presence of freestanding water is important for suitable whitetail habitat and they no doubt benefit from the presence of permanent livestock waters in the allotments.

The Coronado National Forest Plan identifies 1,430,071 acres of occupied habitat for the species in all vegetation types on the Forest (USDA Forest Service 1986). The amount of occupied habitat has not changed significantly since 1986. Several large fires have occurred on the Forest; however, these fires have likely improved deer habitats by creating a variety of seral stages that benefit deer. The quantity and quality of white-tailed deer habitat is considered similar to that available in 1986. The entire project area (approximately 40,000 acres) is considered suitable habitat, and represents approximately

under three percent of the total occupied habitat on the Forest. At lower elevations in the project area, white-tailed deer become less common and are replaced by mule deer.

The project area is included in AGFD Management Unit 30B. AGFD does not typically estimate populations, but monitors trends based on fawn survival and recruitment. Fawn survival over the past four years (2004-2008) in Unit 30B has averaged 50%, indicating a stable or expanding population.

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. However, grazing as proposed would not be of sufficient intensity or duration to affect large scale reductions in cover or result in competition. Displacement or disturbance during range construction activities may occur, but such effects would be of short duration and relatively minor and would have no effect on population trends. 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 (*Ursus americanus*).

Black bears are wide ranging, normally solitary 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. Because of the "sky island" nature of the CNF, black bear populations tend to be isolated from each other by wide expanses of non-suitable habitat between the mountain ranges. Some movement between ranges is known to occur, but is not common. Forage consists of a variety of items including juniper berries, acorns, grapes, raspberries, manzanita berries, carrion, and prickly pear fruit (Hoffmeister 1986). Individual's home range may vary from 7 to 50 square miles (AGFD 1999). The Forest Plan identified 641,113 acres of occupied habitat in all vegetation types except plains grassland and dry desert riparian. Nearly all of the project area could be considered suitable, but marginal and low density bear habitat.

Because of their secretive and solitary nature, bears are difficult to census, and there have been no recent attempts to census bear on the Forest (USFS 2002, PR 59). The Dragoon Mountains are relatively small and isolated and do not support a large black bear population. There is currently no hunting season for black bears in Unit 30B, so hunter kill information is not available. There are no records on file of recent bear depredation incidents in the recent past.

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. 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 any of the action alternatives. 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.

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." Advice from the Forest Service Southwestern Regional Office is to analyze effects in the following manner: (1) effects to Species of Concern listed in the Arizona Partners in Flight Bird Conservation Plan; (2) effects to Important Bird Areas (IBAs) identified by the National Audubon Society; and (3) effects to important overwintering areas.

Species of Concern. The Arizona State Partners in Flight Bird Conservation Plan (Latta 1999) lists priority species of concern by vegetation type. Species that potentially occur in the project area are shown in Table 4. Proposed light to moderate grazing intensities and regular growing season rest are predicted to maintain habitat quality for all species listed in Table 4.

Table 4. Summary of effects of the proposed action on migratory bird species of concern and habitat types in the project area.

Species	Habitat Type	Habitat Description	Effects
Eastern (Azure) Bluebird	Madrean Pine-Oak Woodland	Mixed oak and pines with open canopy and herbaceous understory. Cavity nester.	Light seasonal grazing should maintain herbaceous understory. Proposed action will not change the distribution of mature cavity-producing trees.
Montezuma (Mearns') Quail	Madrean Pine-Oak Woodland	Oak canopy of greater than 20% with understory of perennial grass greater than 6".	Light seasonal grazing will retain herbaceous understory. (See MIS analysis).
Band-tailed Pigeon	Madrean Pine-Oak Woodland	Mixture of acorn-producing trees and a shrubby component.	No actions are proposed that would change the abundance or distribution of oaks.
Botteri's Sparrow	Desert Grassland	Sacaton bottoms bordered by grassy hillsides. Also upland grasslands with mesquite and acacia. Best habitats are off the Forest in the Sulphur Springs Valley.	The species is tolerant of moderate cattle grazing. Light seasonal grazing should maintain herbaceous understory.
Cassisn's Sparrow	Desert Grassland	Tall native grassland with scattered woody shrubs. Less abundant in grasslands dominated by exotic lovegrass.	Light seasonal grazing should maintain herbaceous understory. The extensive presence of Lehmann lovegrass may impact abundance.
Grasshopper Sparrow	Desert Grassland	Large expanses of intermediate height grasses with few shrubs.	The species is tolerant of moderate cattle grazing. Light seasonal grazing should maintain herbaceous understory.
Baird's Sparrow	Desert Grassland	Non-breeding winter resident. Prefers ungrazed or lightly grazed mid-grasses.	Light to moderate seasonal grazing should maintain preferred habitats.
Black-throated Gray Warbler	Pinyon-Juniper	Semi-arid oak-juniper woodlands with a brushy understory. Affected by clearing	Proposed management should maintain woody vegetation on the landscape.

Species	Habitat Type	Habitat Description	Effects
		of woodlands.	
Juniper Titmouse	Pinyon-Juniper	Strongly tied to pinyon-juniper woodlands.	Proposed management would not affect pinyon-juniper woodland density.
Lucy's Warbler	Riparian	Nests in dense xero-riparian washes and mesquite bosques.	Management should retain existing levels of riparian vegetation.

Important Bird Areas. No Important Bird Areas are found in the project area. The closest IBA is the San Pedro River west of the Dragoon Mountains. The proposed action will have no effect on the San Pedro IBA.

Important Overwintering Areas. The proposed action is limited to the authorization of low intensity, seasonal livestock grazing and continues practices that have been in place for many years. The proposal is not expected to affect the overall diversity of the area that provides habitat for wintering birds.

Cumulative Effects – Wildlife. The effects of past activities including livestock grazing, wildfire suppression and mining will continue to affect resource conditions into the foreseeable future. Lehmann lovegrass occurs throughout lower elevations in the analysis area. Cattle can contribute to the distribution of invasive plant seeds and can disturb soils, thereby creating conditions conducive to the growth of invasive plants. Monitoring of rangeland by the Forest Service and the permittee will lead to early identification of invasive exotic plant populations. No future actions have been identified that would contribute significant cumulative effects.

Ongoing activities such as hiking, hunting and vehicle driving are expected to continue within the project area over the life of the project. Hunting is regulated by the Arizona Game and Fish Department and is restricted to relatively few hunters, generally during the fall and winter. Hiking and off-highway vehicle driving occur year-round, but levels of activity are low and confined to a few roads and trails. Minor disturbance associated with smuggling and interdiction efforts will continue.

These activities and occurrences have contributed incrementally to changes in wildlife habitat conditions in the project area and may continue to influence conditions in the project area over the term of the project. However, because no significant direct or indirect effects of the proposed action and alternatives are anticipated, none of the alternatives is expected to contribute cumulatively to the effects of past actions.

Upland Vegetation

Affected Environment

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 predominantly within the Range Woodlands Land Resource Unit (41-3 AZ) as defined by the Natural Resource Conservation Service. The reference range sites used to describe the potential natural community for the purpose of determining rangeland condition include Sandyloam Uplands, Loamy Uplands, Limy Slopes,

Limestone Uplands, Shallow Hills and Shallow Uplands in the 16-20 inch precipitation zone. Rangeland vegetation was assessed in 2006 by the Forest Service using the dry weight rank methodology (PRs 22-29). Monitoring results are summarized below by allotment. In general, monitoring indicates that most sites within the project area are meeting Forest Plan standards or, where conditions are low, they are affected by the invasion of non-native Lehmann lovegrass[8].

Noonan. Upland vegetation condition data collected in 2006 (PR 25) indicate the majority of the capable acres are in fair to good range condition. Lehmann lovegrass is widespread at lower elevations throughout the allotment, which contributes to lower condition ratings. The percentage of bare soil has decreased over conditions measured in the 1960's, indicating positive trends in soil stability.

Halfmoon. Monitoring data collected at four monitoring locations indicate that the allotment is in fair to good condition (PR 22). In lower elevations, snakeweed (*Gutierrezia sarothrae*) and Lehmann lovegrass have increased as a result of recent drought and a history of year-long, concentrated livestock use. Upper elevations have undergone an increase in tree and shrub cover, likely due to long-term fire exclusion.

Fourr. Monitoring data collected at three monitoring locations indicate the allotment is in fair to good condition and meeting Forest Plan standards (PR 23). Lehmann lovegrass, which has increased significantly since previous analyses, tends to lower condition ratings. Woody vegetation has increased on upper elevation sites.

Slavin. Upland vegetation resource conditions are considered stable or improving, although vegetation condition on some sites was rated poor due to the extensive presence of Lehmann lovegrass. Monitoring in 2006 showed significant increases in litter and decreases in bare ground, indicating improving watershed condition and soil stability (PR 24).

Granite Springs. Data collected at five monitoring locations indicate that the majority of the allotment is in fair to good condition (PR 26). The allotment is heavily invaded by Lehmann lovegrass and as a result, condition ratings based on plant species composition are low. Three sites were rated poor based on plant composition. Notwithstanding these changes in plant composition, indicators of watershed health such as bare soil and litter cover show positive trends.

Reppy. Rangeland condition is rated fair with stable trends (PR 27). As with the other allotments, Lehmann lovegrass has invaded large areas of the allotment.

Walnut Springs. Monitoring at two range sites resulted in determinations of fair range condition (PR 28). Indicators of watershed health such as bare soil and litter cover show positive trends.

[8] Lehmann lovegrass is an exotic grass widely seeded during the 1960s. Although this species provides ground cover and acceptable livestock forage, its presence in the community tends to affect estimates of ecological condition. Ecological condition analyses use the Natural Resource Conservation Service (NRCS) similarity index, which compares species composition to the native climax community. The similarity index does not count Lehmann lovegrass because it is not native, yielding a low rating on sites dominated by this species.

Environmental Consequences

Under *Alternative 1* Lehmann lovegrass would likely continue to suppress condition, because a shift in species composition is needed for some areas to reach high condition. Thus many areas will probably remain in fair or lower condition. On open loamy upland sites, residual plant material, both standing and in the form of litter, would be expected to increase in the absence of grazing. 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 frequent fire regime may reduce the density of woody species such as juniper, pinyon pine and oak that currently suppresses herbaceous production in higher elevations. However, Lehmann lovegrass tends to increase after fires, so an increase in this species would be expected under a more frequent fire interval.

Alternative 2 will provide flexibility to adjust to changing forage conditions. Proposed utilization objectives of 30-45% in uplands should maintain plant density and vigor over the term of the analysis, especially if use occurs primarily during the dormant season. Moderate use proposed is expected to leave sufficient residual biomass to protect soils and provide herbaceous fuels to carry fire. Regular growing season rest or deferment on all of the allotments should allow for growth and reproduction of perennial grasses each summer. Management alone may not be sufficient to result in significant changes in plant species composition, and invasive species such as lovegrass and snakeweed would be expected to persist on sites where they are established.

Cumulative Effects – Vegetation. Lehmann lovegrass occurs throughout lower elevations in the analysis area. Cattle can contribute to the distribution of invasive plant seeds and can disturb soils, thereby creating conditions conducive to the growth of invasive plants. The continued presence of this species will continue to affect vegetation composition into the future. Monitoring of rangeland by the Forest Service and the permittee will lead to early identification of other invasive exotic plant populations. Because no significant direct or indirect effects of the proposed action and alternative are anticipated, neither of the alternatives is expected to contribute cumulatively to the effects of past actions. No future actions have been identified that would contribute significant cumulative effects.

Riparian Condition

Affected Environment

Numerous drainages are found in the project area; however the Dragoon Mountains are a relatively dry range and riparian vegetation is limited to short reaches and isolated pockets, often in the vicinity of small springs. There are no perennial streams or wetlands in the project area. Drainages flow seasonally in response to precipitation events. Where riparian vegetation occurs in drainages, it is sustained throughout much of the year by sub-surface flow. Riparian condition analysis is based primarily on information gathered at established riparian area monitoring points. These points were assessed using the Riparian Area Survey and Evaluation System (RASES) data collection technique (USDA 1989). Vegetation data and basic stream morphology data were collected at each of the

monitoring points. Table 5 presents RASES data collected in selected streams bottoms in the project area. There are no channels with riparian potential on the Halfmoon and Reppy allotments, so no data were collected. Stream channels are generally meeting or moving toward Forest Plan standards, except Fourr Canyon where reproduction of riparian obligate trees is lacking.

Table 5. Existing Riparian Condition: Dragoon Mountain Allotments.

Allotment	Stream Name	Year Data Collected	Tree Species Recruitment (species represented in young or seedling age class compared to total number of species found	Tree and Shrub Canopy (Percent Shade	Vigor
Noonan	Noonan Canyon	1999	3 of 4 (2 riparian)	82	Good
Slavin	Stronghold Canyon West (Upper)	1999	9 of 9 (5 riparian)	70	Fair
	Stronghold Canyon West (Lower)	1999	3 of 3 (2 riparian)	30	Good
	Slavin Gulch	1999	4 of 5 (3 riparian)	75	Good
Granite Springs	Clifford Wash (Granite Spring)	1999	2 of 4 (both riparian)	85	Excellent
Walnut Springs	Goodrich Spring (inside exclosure)	1999	1 of 3 (not riparian)	27	Good
	Goodrich Spring (outside exclosure)	1999	3 of 3 (none riparian)	7	Good
Fourr	Fourr Canyon	1999	4 of 7 (none riparian)	47	Good

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.

Under *Alternative 1* some increases in herbaceous cover would be anticipated as cattle would no longer graze in canyon bottoms. Bulk density and soil structure would trend toward natural levels. A reduction in streambank alteration caused by cattle 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. Where trails and roads occur in drainage bottoms, traffic would continue to affect soils and bank stability.

Effects of the proposed action (*Alternative 2*) are described below by allotment.

Noonan. Riparian vegetation and bank stability is considered good in Noonan Canyon (PR 54). Winter grazing at proposed moderate levels will continue to achieve or move toward Forest Plan standards for bank protection and vegetation.

Halfmoon. There will be no effects on riparian areas as none are present.

Slavin. West Stronghold Canyon and Slavin Gulch show a good representation of riparian obligate species, generally good bank protection and stable channels. The proposed level of rotational grazing will have the effect of maintaining these conditions.

Granite Springs. Clifford Wash below Granite Spring has adequate tree and shrub vegetation, but herbaceous bank protecting vegetation is lacking. The proposed level of rotation grazing will have the effect of maintaining current conditions for tree and shrub vegetation. Herbaceous vegetation especially bank protecting vegetation is expected to move toward plan standards and guidelines with periodic rest and deferred grazing.

Reppy. There will be no effects on riparian areas, as none are present.

Walnut Springs. Riparian vegetation is limited to a small but well-represented riparian community in the vicinity of Goodrich Spring. This spring source is fenced to exclude grazing. Outside of the exclosure, the proposed level of rotational grazing will have the effect of maintaining the good representation of riparian obligate species and generally good bank protection. Conditions are expected to move toward plan standards and guidelines.

Fourr. – Fourr Canyon supports some riparian obligate plant species, but there was limited evidence of tree reproduction. The channel appears stable, but is lacking vegetative bank protection. Periodic rest or deferment from grazing will provide opportunities for tree reproduction and increased ground cover.

Cumulative Effects – Riparian. The cumulative effects area for riparian resources includes the watersheds on the Forest and downstream. Off of the Forest and downstream, rural development, farming, grazing and groundwater pumping have affected riparian resources. The direct and indirect effects of implementing either alternative are not expected to contribute significantly to past present and future effects downstream.

Soil Condition

Affected Environment

The geology underlying the project area is generally granite, limestone and alluvium along the gentle terrain in the largest canyons. In general, the soils are shallow to deep very cobbly to extremely cobbly sandy loams with numerous rock outcrops. Elevations range from 4,800 feet above mean sea level at several locations along the east and west Forest boundary to 7,519 feet on Mt. Glenn on the divide between the Halfmoon and Slavin allotments.

In 2006, soil conditions on all eight allotments were evaluated using Forest Service handbook protocols (FSH 2509.18-99-1, R3 Supplement: Soil Management Handbook). Soil condition is evaluated and interpreted using a combination of field inspections, historic livestock use patterns, soil properties and slope characteristics. The soil condition represents an approximation as it is not possible to visit all areas. The analysis is focused on areas of past and present livestock use, which are generally under 40% slope. Approximately 40% of the project area is over 40% slope.

Observations made in the field are that some areas of the most gentle terrain in these allotments have surface soil characteristics described by altered surface soil structure, compaction; vegetative plant communities that represent a drier less productive site, lack of vegetative ground cover, and poor root distribution. These areas comprise seven percent of the project area, mostly on the Halfmoon allotment. Areas of erosion and gully formation are identified on the Halfmoon and Noonan allotments. Ninety-three percent of the project area displays satisfactory soil conditions (Table 6).

Table 6. Soil condition in the Dragoon Mountains allotments.

Allotment	Acres in Satisfactory Condition	Acres in Impaired Condition	Total	% Impaired and Unsatisfactory
Fourr	3,688	0	3,688	0%
Granite Springs	7,011	104	7,115	1%
Halfmoon	5,333	1,719	7,052	24%
Noonan	4,577	828	5,405	15%
Reppy	2,817	0	2,817	0%
Slavin	11,487	0	11,487	0%
Walnut Springs	2,534	343	2,877	12%
Total	36,056	2,994	40,441	7%

Environmental Consequences

Livestock grazing may impact soil function by compacting the soil surface, removing plant material or changing the plant community composition. Where soils are impaired, *Alternative 1* will lead to improved soil quality in areas such as cattle bed grounds and around water sources where cattle tend to concentrate. Over the long term, soil bulk density and structure would return to natural levels. However, change in soil quality is a long-term process and no significant improvements would occur over the short term (5-10 years) under either alternative. Areas of impaired soils on the Halfmoon, Noonan and Walnut Springs allotments would persist for several years and soil compaction would not improve appreciably.

Under *Alternative 2,* periodic growing season rest, light to moderate utilization and implementation of Best Management Practices should maintain adequate vegetation cover and contribute to satisfactory nutrient cycling and soil structure. On impaired soils, bulk density and soil structure will continue to be altered by grazing livestock to some degree. Nutrient cycling and soil structure may continue to be impaired even under light grazing. Effects of the proposed action are described below by allotment.

Noonan. Winter use and annual growing season rest should maintain currently satisfactory soil conditions and improve vegetative ground cover. Accelerated erosion in the form of gullies will not improve without more intensive intervention in the form of

specific erosion control projects. These projects would require a separate analysis and decision. Compaction will not improve during the period of this permit.

Halfmoon. Reduced stocking levels should contribute to maintaining satisfactory soil conditions where they currently exist and improving vegetative ground cover. However, even reduced numbers will contribute to soil compaction unless distribution is also improved. Over time, improved distribution and light to moderate use will allow residual herbaceous biomass to build, contributing to soil stability. Accelerated erosion in the form of gullies will not improve without more intensive intervention. Specific erosion control projects will be needed. Compaction will not improve during the period of this permit.

Slavin. The proposal to graze no more than six months in any year at this level will have the effect of maintaining the satisfactory soil conditions.

Granite Springs. The proposal to graze at this level will have the effect of maintaining the satisfactory soil conditions.

Reppy. The proposal to graze at this level will have the effect of maintaining the satisfactory soil conditions.

Walnut Springs. The proposal to conduct rotational grazing at this level will have the effect of maintaining the satisfactory soil conditions.

Fourr. – The proposal to graze no more than six months in any year at this level will have the effect of maintaining the satisfactory soil conditions.

Cumulative Effects – Soils. The effects of past activities including livestock grazing, wildfire suppression and mining will continue to affect soil conditions into the foreseeable future. Historic fuelwood harvesting both for mining and personal uses was conducted prior to the implementation of Best Management Practices. This has contributed to historic soil loss. Soil loss is likely irretrievable in human time frames, so historic activities will continue to affect soil conditions in the area. Ongoing activities such as dispersed recreation, smuggling and traveling on existing roads will continue to affect soil condition in small areas where these activities are concentrated. No future activities are identified that would affect soils in the project area. The proposed action is designed to minimize or mitigate direct and indirect soil effects, and therefore would not contribute significant cumulative effects.

Water Quantity and Quality

Affected Environment

The allotments are located within the upper headwaters of two fifth code watersheds: Clifford Wash – Upper San Pedro River to the west and Willcox Playa to the east (Figure 7). The average annual precipitation (1948-1978) at Sala Ranch (elevation 5200 feet) on the Granite Springs allotment group is 15.95 inches; more current records at Pierce/Sunsites (elevation 4374) on the east side of the allotment group is 12.07 inches (Western Regional Climate Center http://www.wrcc.dri.edu/index.html).

Water quantity (surface water yield) is affected by hydrologic function, which is the ability of soil to capture, hold and release water. Hydrologic function is strongly

influenced by soil condition. As the surface soil parameters of bulk density and structure degrade due to compaction by hoof impact and vehicle traffic, water quantity in the form of runoff increases. The result is generally an increase in peak flow discharges. Areas with satisfactory soil condition are assumed to have satisfactory hydrologic function. Approximately 7% of the project area may have compromised hydrologic function due to impaired soils. Throughout the project area, water is diverted and stored for livestock use either in earthen tanks or through spring diversions. A water budget developed for the allotments indicates that this is well under 1% of the total water yield in the project area (PR 51).

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. Due to the absence of perennial streams in the project area, water quality has not been assessed. Surface water quality is affected by erosion of the soil surface. Adequate vegetation groundcover is necessary to slow the movement of water and trap and filter sediments.

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 areas with impaired soils, the increase in ground cover 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 due to less sediment and lower 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 are unlikely to be measurable. Allowable use levels of 30-45% are expected to provide sufficient residual biomass to protect upland areas and drainage systems over time.

Under either alternative, small areas of active gully erosion would persist on the Noonan and Halfmoon allotments. These areas likely will require more intensive intervention to arrest ongoing erosion.

Water Quantity. Under *Alternative 1*, adequate vegetation groundcover would contribute to improved hydrological function and runoff would continue to be satisfactory. Water currently consumed by or diverted and stored for livestock would be returned to the system, but this accounts for less than 1% of the total water yield on the analysis area and is unlikely to be significant. Under *Alternative* 2, light to moderate use should provide sufficient residual plant material to protect uplands and drainages and contribute to soil stability over time. Existing water developments would divert and store water that would otherwise percolate back into the ground and support sub-surface flow. Livestock would consume some of the stored water. However, this amount is unlikely to significantly affect total water yield. New water developments consist of extensions of

existing pipelines and additional storage capacity. Two new wells are identified. These would tap into ground water and would not be expected to affect surface flow.

Best Management Practices recommended by the Arizona Department of Environmental Quality are included in the proposed action to minimize the effects of the proposed action on soils and watersheds.

Cumulative Effects – Water. No significant direct or indirect effects to water quality and water quantity are identified. Therefore, cumulative effects are not anticipated.

Air Quality

Affected Environment

The project area is located entirely within a Class II (generally rural) airshed. 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 associated with this project will not significantly affect the factors contributing to a high quality air shed. Selection of the No Action Alternative or the Proposed Action would not negatively affect air quality. No direct or indirect effects would occur to air quality from this project. Because there will be no direct or indirect effects, no cumulative effects are anticipated.

Special Management Areas

Affected Environment

The Dragoon Mountains do not contain designated wilderness, wild and scenic river segments, research natural areas, zoological botanical area or other areas that would require special management by regulation or Forest Plan direction. However, portions of the project area fall within inventoried roadless areas (Figure 9). Inventoried roadless areas are managed to preserve their roadless characteristics (FSM 1925.03, WO Interim Directive 1920-2006-1). Roadless area characteristics are defined in the 2001 Roadless Rule (36 CFR Part 294, Subpart B) as the following: (1) High quality or undisturbed soil, water and air; (2) Sources of public drinking water; (3) Diversity of plant and animal communities; (4) Habitat for threatened, endangered, candidate and sensitive species dependant on large, undisturbed areas of land; (5) Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation; (6) Reference landscapes; (7) Natural appearing landscapes with high scenic quality; (8) Traditional cultural properties and sacred sites; and (9) Other locally identified unique characteristics.

Environmental Consequences

Neither alternative would result in the construction of new roads or the maintenance of existing roads within inventoried roadless areas. Managed seasonal livestock grazing will continue within portions of the IRAs at moderate levels under the proposed action. As documented elsewhere in this analysis, the limited intensity and duration of grazing is not

expected to result in adverse effect to soil, air, water, wildlife and plants, or traditional cultural properties. Therefore, there will be no direct, indirect or cumulative effects on the roadless status or roadless characteristics of the IRAs.

Heritage Resources

Affected Environment

Heritage resources (also called "cultural resources") include archaeological and historical sites and other properties important to maintaining the traditional beliefs and lifeways of local social groups ("traditional cultural properties"). Archeological surveys in Forest Service files have covered approximately 1,500 acres and recorded 74 sites within the project area. Most of the recorded sites represent the remnants of precontact occupation and use of the area. These sites include lithic scatters, bedrock mortars, rock art and rock shelters. The remaining sites are associated with occupation during the Historic Period and include structures and numerous 19th century artifacts. The Council Rocks Archeological District and the Dragoon Springs Stage Station, both listed on the National Register of Historic Places, are located within the project area.

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.

Adoption of *Alternative 1* would result in no direct or indirect effects from livestock grazing on heritage resources. The proposed action (*Alternative 2*) would require implementation of the mitigation measures identified as part of the proposed action in order to insure that there would be no adverse effects to heritage resources as the result of new range improvements. Implementation of range facilities will occur in accordance with Section 2(c) of the *Standard Consultation Protocol for Rangeland Management, Appendix H of the Forest Service Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection* (PR 61). Specific design details and precise locations have not been identified for several proposed range facilities. When exact locations have been established, the sites will be surveyed for cultural resources prior to ground-disturbing activities. Provided the consultation protocol would be followed, a Forest Archeologist has determined that the proposed action would have no adverse effect on historic properties in the project area. A resources report was prepared and submitted to the Arizona State Historic Preservation Office (SHPO) for concurrence (PR 60).

Economics

Affected Environment

The economic effects of the proposal were not identified as a key issue during scoping, and specific operating costs and revenue estimates are not available for each ranch.

Therefore a detailed economic analysis was not conducted. However, the generalized effects of the alternatives can be compared in the context of the local economy. The allotments are located in Cochise County, Arizona. Tourism and financial services are a growing segment of the economy of Cochise County. Farm and ranch employment is considered an important segment of the economy, but total agricultural employment (farming and ranching) accounted for 3.3% of the economy in 2000 (USDA Forest Service 2005, Headwaters Economics 2007, PR 62). Ranching operations in the area tend to be characterized by small profit margins with the need for off-ranch supplemental income to continue operations. Forest-wide, grazing accounts for an estimated 4% of the direct and indirect employment generated in the local economy associated with the Coronado National Forest (USDA Forest Service, 2005b). Compared to other sectors such as recreation (which accounts for 60%), this contribution is relatively minor.

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 from the sale of goods and services associated with ranch operations.

Termination of the grazing authorizations (*Alternative 1*) would likely result in negative economic effects on the individual permittees. Although they would no longer pay grazing fees or expend money to maintain the allotments, the permittees would be dependant on adjacent private or state land, if available, to maintain ranching operations. Annual grazing receipts to the Forest Service would vary from zero under *Alternative 1* to approximately $10,068 under maximum allowable use on all allotments under *Alternative 2*[9]. 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 $2,500/year under full stocking) would not be available to the Forest Service under *Alternative 1*.

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*, several 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.

[9] Estimate based on the 2008 grazing fee of $1.35 per AUM

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]."

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.

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The Forest Service consulted the following Federal, State, and local agencies, tribes and organizations 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
Arizona Department of Agriculture
Arizona Department of Environmental Quality
Arizona Cooperative Extension Service
Arizona State Land Department
USDA Natural Resource Conservation Service
USDI Fish and Wildlife Service

TRIBES:

Fort Sill Apache Tribe
Mescalero Apache Tribe
San Carlos Apache Tribe
White Mountain Apache Tribe
Ak-Chin Indian Community
Pascua Yaqui Tribe
Hopi Tribe
Pueblo of Zuni
Tohono O'odham Nation
Yavapai Apache Nation
Gila River Indian Community
Salt River Pima-Maricopa Indian Community

OTHERS:

National Wild Turkey Federation
Western Watersheds Project
Forest Guardians
Sky Island Alliance
Center for Biological Diversity
Arizona People for the USA

REFERENCES

Arizona Game and Fish Department. 1999. Wildlife 2006. AGFD. Phoenix, AZ.

Arizona Game and Fish Department. 2001. Cnemidophorus burti stictogrammus. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ.

Arizona Game and Fish Department. 2003. Sceloporus slevini. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ.

Arizona Game and Fish Department. 2005. Mearns' Quail Habitat Management Guidelines. Arizona Game and Fish Dept. Phoenix, AZ.

Baker, M.A. 1999. The status and distributions within the Coronado National Forest of (several plant species including) *stellari porsildii*. SWBR report prepared under contract with the Coronad National Forest.

Bowers, J.E. and S.P. McLaughlin. 2001. Effects of livestock grazing on *Agave palmeri* within the Coronado National Forest, AZ. Annual report submitted to USGS Sonoran Desert Field Station, 125 Biological Sciences East, The University of Arizona, Tucson, AZ. 85721.

Bristow, Kirby D. and Richard A. Ockenfels. 2000. Effects of human activity and habitat conditions on Mearn's quail populations. Arizona Game and Fish Department. Phoenix, Arizona. Research Branch Technical Guidance Bulletin No. 4 (August 2000). 27pp.

Brown, D.E. 1989. Mearns' (Montezuma) Quail. Pp. 105-12- *in:* Arizona Game Birds. University of Arizona Press and Arizona Game and Fish Department, Tucson.

Brown, R.L. 1982. Effects of livestock grazing on Mearns' quail in southeastern Arizona. Journal of Range Management 35:727-732.

Clarkson, R.W., and J.C. Rorabaugh. 1989. Status of leopard frogs (*Rana pipiens* Complex) in Arizona and southeastern California. Southwestern Naturalist 34(4):531-538.

Corman, T.E. and C. Wise-Gervais. 2006 Arizona Breeding Bird Atlas. University of New Mexico Press.

Headwaters Economics. 2007. A SocioEconomic Profile of Cochise County, Arizona. Produced by the Economic Profile System (www.headwaterseconomics.org).

Heffelfinger, James R. and Ronald J. Olding. 2000. Montezuma quail management in Arizona. Pages 183-190 *in* L.A. Brennan, W.E. Palmer, L.W. Burger, Jr., and T.L. Pruden (eds.). Quail IV: Proceedings of the Fourth National Quail Symposium. Tall Timbers Research Station, Tallahassee, FL.

Hoffmeister, Donald F. 1986. Mammals of Arizona. The University of Arizona Press and the Arizona Game and Fish Department. Tucson, Arizona. 602pp.

Holechek, J.L, T.T Baker and J.C, Boren. 2004. Impacts of controlled grazing verses grazing exclusion: What we have learned. Range Improvement Task Force Report # 57. New Mexico State University, Las Cruces, NM.

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

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

Latta, M. J., C.J. Beardmore, and T. E. Corman. 1999. Arizona Partners in Flight Bird conservation Plan. Version 1.0. Nongame and Endangered Wildlife Rechnical Report 142. Arizona Game and Fish Department, Phoenix, Arizona.

Lefevre, R. 2007. Riparian specialist's report submitted for the Dragoon Mountains allotments analysis. Unpbl. Coronado National Forest, Tucson, AZ.

Malusa, J.P., 2001. Surveys of Sensitive Plants of the Coronado National Forest. USFS contract 43-8-97-0-0083. unpbl.

Mann, S. 2005. Comments submitted 3/18/2005 and 10/14/2005 in response to Federal Register notice of review for the lesser long-nosed bat.

McLaughlin, S.P. 1995. An overview of the flora of the sky islands, southeastern Arizona: diversity, affinities, and insularity. Pages 60-70 *in* DeBano et al., eds. Biodiversity and management of the Madrean archipelago: the sky islands of southwestern United States and northwestern Mexico. Gen. Tech. Rep. RM-GTR-264. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

North American Breeding Bird Survey. *The North American Breeding Bird Survey, Results and Analysis 1966 - 2003. Version 2004.1. USGS Patuxent Wildlife Research Center, Laurel, MD.*

Ockenfels, R.A., D.E. Brooks, and C.H. Lewis. 1991. General Ecology of Coues White-tailed Deer in the Santa Rita Mountains. Arizona Game and Fish Department Research Branch Technical Report No. 6. Phoenix, AZ.

Smith, L., G. Ruyle, J. Maynard, S. Barker, W. Meyer, D. Stewart, B. Coulloudon, S. Williams and J. Dyess. 2007. Principles of obtaining and interpreting utilization data on rangelands. University of Arizona Cooperative Extension Service Publication AZ1375.

Society for Range Management, 1998. Glossary of Terms used in Range Management. Fourth Edition, edited by the Glossary Update Task Group, Society for Range Management. Thomas E. Bedell, Chairman. 32 pp.

Sredl, M.J., B. Healy, L. Saylor, V. Miera, and E. Wallace. 1999. Coronado National forest Historical Sensitive Herpetofauna Records and Leopard Frog Identification Cards. Arizona Game and Fish Department, Amphibians and Reptiles Program. Phoenix, AZ.

Sredl, M.J., J.M. Howland, J.E. Wallace, and L.S. Saylor. 1997. Status and distribution of Arizona's native ranid frogs. Pages 45-101 *in* M.J. Sredl (Ed). Ranid frog conservation and management. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Technical Report 121. Phoenix, Arizona.

Stromberg, M.R. 1990. Habitat, movements and roost characteristics of Montezuma Quail in southeastern Arizona. Condor92:229-236.

USDA Forest Service. 1986. Coronado National Forest land and resource management plan. USDA Forest Service, Southwest Region. Albuquerque, New Mexico. 130pp + Amendments.

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

USDA Forest Service, 1998 and 2002. Biological Assessment of Ongoing and Long-term Grazing on the Coronado National Forest, Coronado National Forest, Tucson.

USDA Forest Service. 2006. Coronado National Forest Management Indicator Species Population Status and Trends: 1986-2006.

USDA Forest Service. 2004. Programmatic Biological Assessment. Continued implementation of the land and resource management plans for the eleven National Forests and National Grasslands of the Southwestern Region. Region 3. Albuquerque, NM.

USDA Forest Service. 2005. Socio-Economic Assessment of the Coronado National Forest. Prepared for the Southwestern Region by the University of Arizona School of Renewable Natural Resources. Tucson, AZ.

USDA Forest Service. 2007a. Agave monitoring five-year report (2003-2007). Unpublished report submitted to USFWS. Sierra Vista Ranger District.

USDA Forest Service. 2007b. Regional Forester's List of Sensitive Plant and Animal Species. USDA Forest Service Southwestern Region. Albuquerque NM.

USDI Fish and Wildlife Service, 1999 and 2002. Biological Opinion 2-21-98-F-399-R1, Continuation of Livestock Grazing on the Coronado National Forest, U.S. Fish and Wildlife Service, Phoenix, AZ.

USDI Fish and Wildlife Service. 2005. Programmatic Biological and Conference Opinion. Continued implementation of the land and resource management plans for the eleven National Forests and National Grasslands of the Southwestern Region. Region 2 Office, Albuquerque, NM.

Whetstone, Jack. 1995. Baird's sparrow winter habitat assessment on the grasslands of the Coronado National Forest. U.S. Department of Interior, Bureau of Land Management. Sierra Vista, Arizona. Unpublished.

Widmer, K.A. 2001. The relationship between *Agave palmeri* flower stalk herbivory and livestock management on the Coronado National Forest. MS Thesis. University of Arizona School of Renewable Natural Resources. 2002

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