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Environmental Assessment

Lake Allotment Analysis

**Nogales Ranger District, Coronado National Forest
Santa Cruz and Pima County, Arizona**

Township 22 S, Range 11 E, Sections 5, 8, 17 and 18

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1. PURPOSE AND NEED FOR ACTION

Background

This Environmental Assessment (EA) describes a Forest Service proposal to authorize grazing on the Lake Allotment in the Tumacacori Mountains, Nogales Ranger District, Santa Cruz and Pima Counties, Arizona. The EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and one alternative.

Federal actions such as the authorization of grazing must be analyzed to determine potential environmental consequences pursuant to the *National Environmental Policy Act of 1969* (NEPA) and the *Rescission Act (P.L. 104-19, 1995)*. Supporting documentation, including more detailed analyses of project area resources and records of public participation, is on file in the project planning record in the Nogales Ranger District Office, Nogales Az. Throughout this EA, references to supporting documentation are shown in parentheses. For example, a reference “(PR 21)” would indicate that a specific passage in the EA is supported by information contained in document No. 21 in the project record.

Purpose and Need for Action

Where consistent with other multiple use goals and objectives, there is congressional intent to allow grazing on suitable National Forest System 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*)(PR 30-34). By federal 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*).

The Lake Allotment includes land identified as suitable for grazing in the Coronado National Forest Land and Resource Management Plan (Forest Plan). 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 allotment requires an 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*).

Existing Condition

The grazing allotment is located on the western portion of the Tumacacori Mountains. The Tumacacori Mountains are well known for their scenic topography and high diversity of wildlife and plants. Vegetation communities are quite diverse. Lower elevations support desert grasslands which transition into Madrean Encinal woodlands and chaparral at middle elevations. Higher elevations support a plant community dominated by broadleaf forests. Major drainages in the project area include Bartolo Canyon and Chimenea Canyon. Recreation use is high in the project area.

Permitted livestock use and recent actual use are displayed in Table 1. Current allotment management practices and management issues are briefly summarized below.

The Lake Allotment is permitted for 31 cow/calf pairs yearlong, from March 1 to February 28. The allotment is permitted and managed in combination with private and state lands. Cattle are rotated through three pastures, and then moved onto the private and state land over the course of the grazing season. Monitoring records indicate that annual utilization is usually 35 percent or less (PR 5). There are no significant resource issues identified for this allotment, but some fences are in need of repair.

Table 1. Current permitted and authorized use and proposed use. Recent actual use is shown in head-months (No. of cattle X No. of months grazed) because cattle numbers vary throughout the grazing season.

	Lake
Total Acres	2,696
Total NFS Acres	2,232
Capable Acres	2,232
Permitted Use	31 cow/calf On/Off
Grazing Season	03/1 to 02/28
Actual Use	314 AUMS
Permitted use Head Months	491
Head Months grazed between 1999-2014:	491

Management Direction

The project area falls entirely within Forest Plan Management Areas (MA) 4. Management emphasis for this area is described below.

Management Area 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).

Desired Condition

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

- To restore rangeland to at least moderately high ecological condition (70% to 75% of potential production, fair range condition) with stable soil and a static to upward trend.
- Produce livestock products consistent with other resources and uses.
- Eliminate grazing from areas not capable of supporting livestock without significant detriment to range or other resources.
- Balance permitted grazing use with grazing capacity.
- Provide habitat for wildlife populations consistent with the goals outlined in the Arizona and New Mexico Department of Game and Fish Comprehensive Plans and consistent with other resource values.
- Provide for ecosystem diversity by at least maintaining viable populations of all native and non-native wildlife, fish and plant species through improved habitat management.
- Improve the habitat of and protection for local populations of threatened and endangered species to meet the goals of the Endangered Species Act.
- Provide a favorable flow of water in quantity and quality for off-forest users by improving or maintaining all watersheds to a satisfactory or higher level.
- Allow the use of available National Forest lands for appropriate public or private interests consistent with National Forest Policies.
- Protect significant cultural resources from damage by project activities or vandalism.
- Manage existing wildernesses to preserve and protect the wilderness character in accordance with the various wilderness acts.

Based on Forest Plan goals and site-specific knowledge of the allotment, the following objectives constitute the desired condition for the analysis area. Monitoring methods to be used to determine achievement of each objective are also identified:

- 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 on pages 15 and 16.
- Ecological sites within the allotments have stable soils, functional hydrology and support functional biotic communities. All areas are at or moving toward their

- ecological potential. Achievement will be monitored through effectiveness monitoring described under the proposed action on pages 15 and 16.
- Native vegetation in riparian bottoms is a diverse mix of perennial grasses, forbs, shrubs and trees. Recruitment of young trees is occurring and trees and shrubs show no evidence of high-lining or hedging. Riparian bottoms throughout the allotments provide suitable year-round habitat for species dependent on herbaceous cover. Achievement will be monitored through implementation and effectiveness monitoring described under the proposed action and monitoring at established riparian monitoring transects.
 - Areas of historic heavy livestock use have increasing ground cover and litter and stable soils. Achievement will be monitored through implementation and effectiveness monitoring described under the proposed action.
 - 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 the allotment 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 continued livestock grazing on the Lake Allotment. The proposed action consists of four components - **authorization, improvements, management practices and monitoring** – implemented using an adaptive management strategy. Light to moderate grazing intensities and regular growing season rest or deferment would 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. The proposed action is described in detail as Alternative 2 in the Alternatives section, below.

Decision Framework

The Nogales District Ranger is the official responsible for decisions regarding management of the Lake Allotment. Based on the results of the NEPA analysis, the District Ranger will issue a decision document that include(s) a determination of the significance of the environmental effects and whether an environmental impact statement will be prepared. The decision 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 District Ranger would determine which management actions, mitigation measures and monitoring requirements would be prescribed in the Allotment Management Plans. These would include permitted use, season of use, allowable utilization standards and the term of the permits.

Public Involvement

Prior to developing proposed actions, the Forest met with the permittees on the allotments to identify management objectives and strategies. The proposal was listed in the Schedule of Proposed Actions in June 2009, and was provided to the public and other agencies for comment during scoping on August 04, 2009 (PR 7). Five comment letters were received in response to the scoping notice (PRs 8-12) Using the comments from the public and other agencies, the interdisciplinary team developed a list of issues to address (see below).

The public was also notified of the opportunity to comment through a legal notice published in the *Nogales International* on May 14, 2009.

Another round of scoping was done on this allotment starting 05/31/2012 (PR 18). Two comments were received in response to the scoping notice (PR 19 and 20). Additionally an interdisciplinary team field visit was conducted on February 22, 2012 to determine if there had been any change in the data that was gathered in 2008. In the spring of 2014 specialists inspected the allotment on several occasions to update range infrastructure and forage use data. This has been recorded in inspection reports. (PR 26& 26.1)

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.¹ An analysis of the issues and scoping responses is included in the Record as PR 31.

Issues

No issues were identified that could not be addressed through mitigation or project design modifications, which including comments received from ADEQ in reference to Arivaca

¹ 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)..."

Lake having impaired levels of mercury in fish tissue. Furthermore ADEQ states “Grazing Management practices implemented on this allotment should minimize erosion and sediment transport because Total Maximum Daily Load analysis completed in 1999 indicates that soils in this area may be contributing mercury loading to the lake”. Additionally the use of grazing best management practices encouraged by ADEQ have already been incorporated into the project design as directed through Forest Service Handbook: 2509.22.

Other Concerns

Other concerns are identified below. These have been taken into consideration in the development of the projects proposed action.

Arivaca Lake - The Arizona Game & Fish Department own the Arivaca Lake and its immediately adjacent shore line. The impoundment was improved using a grant from the Sport Fish Restoration Program. One of the guidelines of the program is that: it prohibits uses of the facility that may conflict with its intended purpose. The majority of Arivaca Lake shorelines and the boat ramp area that are accessible to fishermen are fenced and excluded from livestock use. Livestock use is only incidental in the areas not fenced. Livestock have access to multiple livestock waters adjacent to the lake.

Wildlife – Continued grazing in the project area could result in effects to wildlife, including ESA listed species, Regional Forester sensitive species, CNF management indicator species, and migratory bird species, along with their associated habitats. Effects are dependent on the timing, intensity, frequency and duration of grazing and other management activities.

Riparian condition – Grazing in riparian areas could affect riparian conditions, especially where perennial water occurs.

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.

Drought- A diversity of factors should be considered when devising management actions on the National Forests in the Southwestern Region. Such factors would include species diversity, past grazing use, timing of grazing, intensity of management, and conditions of improvements to support grazing activities. These factors along with precipitation data provide flexibility to the line officer to make decisions based on recommendations from district rangeland management specialists. See drought guidelines FSH 2209.13 – GRAZING PERMIT ADMINISTRATION HANDBOOK CHAPTER 10 - PERMITS WITH TERM STATUS Supplement No.: 2209.13-2006-1

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

2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

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

Alternatives Eliminated From Detailed Study _____

Continue Current Management. Under this alternative, there would be no change in allotment management. As the permit expires, a new permit would be issued for the classes and numbers of livestock currently permitted. Annual authorized use would continue to be controlled through annual operating instructions. Existing improvements would be maintained. This alternative assumes management intensity, utilization and distribution patterns similar to the past five years. Although this alternative would achieve many of the resource objectives identified in the purpose and need, this alternative was not carried forward because it would not increase management flexibility through formal implementation of adaptive management.

Alternatives Considered in Detail _____

Alternative 1

No Action

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

Alternative 2

The Proposed Action

The Forest's proposed action is to authorize continued livestock grazing on the Lake Allotment. 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 the allotment using rotational or seasonal grazing in order to incorporate growing season rest or deferment to allow for grazed plant recovery. On the allotment, the sequence and timing of pasture moves and the timing of entry and exit from the allotment would be based on monitoring of range readiness, ecological condition, water availability and utilization. Use would occur primarily in the non-growing season. Where growing season use occurs, pastures used in one year will be rested or deferred the following growing season to provide for plant regrowth and recovery.
- **Intensity of grazing.** Forage utilization would be managed at a level corresponding to light to moderate intensity (30-45%)² 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.
- **Permit issuance.** A new 10-year term grazing permit would be issued for the allotment for the numbers and terms identified below and in Table 1. The term grazing permit would identify the number, kind and class of livestock authorized and the season of use as required by Forest Service policy (FSM 2231.11). The permit would also identify the total animal unit months (AUMs)³ authorized for

² 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.

³ 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

the permit. The number and class of livestock and season of use would be allowed to vary depending on resource conditions and management objectives, provided that annual use does not exceed the total AUMs authorized or the season of use identified for the allotment. Such changes will be documented and authorized in annual operating instructions. 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]. Note: Proposed authorized use displayed below for the Lake Allotment reflects modifications made subsequent to and in response to public and permittee review of the proposed action. The rationales for changes in proposed authorizations are described after the following list.

- **Proposed Lake Authorized Use.** Up to 31 cow/calf pairs, March 1 to February 28 (up to 372 AUMs).

- **Change from current management.** Changes are largely intended to promote growing season rest or allow additional opportunities for pasture deferments to avoid use during the same period in consecutive years.

- Permitted numbers and total AUMs of available forage would not change; however, the season of use would initially be changed from the summer growing season to the winter dormant season to provide growing season rest. The authorization would remain year-long in order to provide the flexibility to rotate and defer pastures in some years. Current permitted use and authorized AUMs of forage would continue.

- **Allotment Management Plans.** Consistent with Forest Service manual guidance (FSH 2209.13, 94), a new allotment management plan (AMP) would be developed for the allotment and would be incorporated into any term grazing permit issued. The AMP would specify the goals and objectives of management, management strategies, range improvements and monitoring requirements and would incorporate an adaptive management strategy described below.

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.

- **Annual Operating Instructions.** On an annual basis, the Forest and permittee would jointly prepare annual plans, referred to as Annual Operating Instructions (AOI), prior to each grazing year. The AOI would set forth:
 - The maximum permissible grazing use authorized on the allotment for the current grazing season and the number, class and kind of livestock, and the timing and duration of use.
 - The planned sequence of grazing in pastures on the allotment, or the management prescriptions and monitoring that will be used to make changes.
 - Structural and non-structural improvements to be constructed, reconstructed, or maintained and who is responsible for these activities.
 - Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.
 - Monitoring for the current season that may include, among other things, documentation demonstrating compliance with the terms and conditions in the grazing permit, AMP and AOI.

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

2. Improvements

No new structural improvements (waters and fences) are currently proposed for the allotment in this analysis. Future monitoring or circumstances may identify the need for additional improvements. In this case, the need for, and site-specific effects of, each additional improvement will be evaluated as described under *Adaptive Management*, below.

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

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 49) 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 National Forest System Lands (NFS) in order to minimize the introduction of weed seeds.
- Invasive weed prevention BMPs will be followed, including minimizing ground disturbance, preventing weed seed transportation on animals, humans, or equipment, maintaining healthy, weed-free vegetation through proper stocking rates and rest, and managing weed infestations to limit weed seed dispersal into weed-free areas (Clark, 2003).

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.
- In the event that the need for new range improvements is identified, 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.

- In the event that the need for new range improvements is identified, all proposed range improvements 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 which would also include the Pima pineapple cactus, if found to be present.
- The Forest will implement the Forest's Stockpond and Aquatic Habitat Management and Maintenance Guidelines for the Chiricahua leopard frog (*Lithobates chiricahuensis*) (PR 51). 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.

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:

- If new range facilities are proposed, the locations 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 the long term condition and trend of upland and riparian vegetation, soil, and watersheds. Monitoring will be done following procedures described in the Interagency Technical Reference (1996)⁴ and the

⁴ Sampling Vegetation Attributes, Interagency Technical Reference. 1996. Cooperative Extension Service, USDA Forest Service and Natural Resources Conservation Service, and USDI Bureau of Land Management.

Region 3 Rangeland Analysis and Training Guide (USDA-FS 1997). Monitoring 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 (Riparian Area Survey and Evaluation Survey or proper functioning condition), soil and watershed condition assessments and repeat photography. Monitoring will occur at established permanent monitoring points.

Implementation monitoring will occur on an ongoing basis and will include such things as inspection reports, seasonal and annual forage utilization measurements, livestock counts and facilities inspections. Utilization measurements are made following procedures found in the Interagency Technical Reference⁵ and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands (Smith, et al 2007, PR 35).

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 areas⁶, but may include monitoring outside of key areas. Utilization on non-grass species (forbs, shrubs and trees) may also be measured if appropriate for the site. The Nogales District Range Staff Officer and the permittee 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.

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 annually, specific dates for grazing, class of animal and modifications in pasture rotations may be

⁵ Utilization Studies and Residual Measurements. Interagency Technical Reference. 1996. Cooperative Extension Service, USDA Forest Service and Natural Resources Conservation Service, and USDI Bureau of Land Management. Revised 1999.

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.

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 District Ranger will determine whether correction, supplementation or revision of the EA is necessary in accordance with Forest Service Handbook direction at FSH 1909.15(18) and FSH 2209.13(96.1), or whether further analysis under NEPA is required.

Future Review of the Decision

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

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2. Comparison of the Alternatives.

Attribute	Alternative 1	Alternative 2
National Forest Policy and Forest Plan Consistency	Consistent with Forest Plan and policy.	Consistent with Forest Plan and policy.
Meets purpose and need	Yes.	Yes. Balances use with capacity. Provides management flexibility.
Effect on Wildlife and Plants	No Effects from grazing. Loss of water for wildlife from livestock infrastructure.	Effects mitigated. Light to moderate Utilization and emphasis on winter use reduces localized effects to habitats.
Effects on soil and watershed	No effects from grazing. Improvement in soil and	Moderate use contributes to watershed stability. Concentrations of cattle may

Attribute	Alternative 1	Alternative 2
condition	watershed cover over time.	contribute to localized soil impairment.
Effects on upland vegetation	No effects from grazing. Increasing plant cover and litter over time.	Moderate use levels and emphasis on winter use maintain satisfactory conditions.

3. ENVIRONMENTAL CONSEQUENCES

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

Wildlife

Affected Environment

The grazing allotment is located on the western portion of the Tumacacori Mountains. The Tumacacori Mountains are well known for their scenic topography and high diversity of wildlife and plants. Vegetation communities are quite diverse. Lower elevations support desert grasslands which transition into broadleaf evergreen woodlands and chaparral at middle elevations. Higher elevations support a plant community dominated by broadleaf forests. Major drainages in the project area include Bartolo Canyon and Chimenea Canyon. Recreation use is high in the project area.

Threatened and Endangered Species

Effects of the ongoing grazing activities on the Lake Allotment have been evaluated in Biological Assessments (BA) of Ongoing and Long-term Grazing on the Coronado National Forest in 1998 and again in 2002 (USFS 1998, 2002, USDI-FWS 2002,). The effects of continued implementation of the Forest Plan, including livestock grazing, were evaluated in 2005 (USDA-FS 2004, USDI-FWS 2005). The effects of ongoing grazing on Mexican Spotted Owl critical habitat were assessed in 2004. Livestock grazing is currently managed to comply with the 2002 and 2005 Biological Opinions from the U.S. Fish and Wildlife Service.

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 2010. The effects of ongoing livestock grazing were evaluated in 2010 with the Lake Allotment BA. Since that time additional species have been listed and the BA was updated (2014) and consultation reinitiated in 2015. 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.

JAGUAR

Background. The Jaguar was listed as Endangered without critical habitat throughout its range in the United States in 1997 (62 FR 39147). In 2014, critical habitat for the Jaguar

was designated in portions of the CNF south of Interstate 10 including the Nogales Ranger District.

Jaguars historically occurred in the mountains of eastern Arizona and southwestern New Mexico, including the project area (Lange 1960). No breeding populations are known to exist in the United States at this time; however, individuals are occasionally sighted. Throughout their range, jaguars demonstrate an affinity for lowland wet habitats. These types of habitats are very limited in Arizona, and most observations are from Madrean evergreen woodlands, shrub-invaded semi-desert grassland and along rivers. Jaguars typically have large home ranges with a primary diet of javelina, mule and white-tailed deer and other smaller prey.

LESSER LONG-NOSED BAT

Background. The lesser long-nosed bat (LLNB) was listed as Endangered without critical habitat on September 30, 1988 (53 FR 38456). A recovery plan was completed in 1995. There is a finding that delisting from endangered to threatened may be warranted for the species (USDI-FWS 2013).

The LLNB is found southern Arizona south to El Salvador. The LLNB arrives in Arizona in early April and migrates south in mid-September to late October (Cockrum and Petryszn 1991, Sidner 1999). The species feeds on the nectar and pollen of paniculate agaves (*Agave palmeri*, *A. parry*, and *A. deserti*) and the nectar, pollen and fruit of columnar cactus.

One LLNB roost is known from the Pajarito Mountains to the east and un-surveyed mine adits and caves in the project area represent potential roost sites. No quantitative measurements of agave density or estimates of the extent of livestock herbivory have been made on the allotment. Field observations made during 2003 and 2004 indicate that agaves are not common or well distributed throughout the area. Isolated plants are found as individuals or occurring in small clusters spread across the landscape. Because the LLNB readily flies long distances from roosts to forage, it has been postulated that such low-density, widely dispersed agave populations provide connectivity for bats between and within mountain ranges (USFS 2004a).

MASKED BOBWHITE

The masked bobwhite was listed as Endangered on March 11, 1967 (35CFR 4001) and June 2, 1970 (35 CFR 8495) without critical habitat.

This bird is found in desert grassland at elevations of 1,000-4,000 ft (300-1,200 m). Its historical range was in grasslands throughout most of Sonora, Mexico and the Altar and Santa Cruz Valleys of Pima and Santa Cruz Counties, Arizona. It inhabited Sonoran savanna grasslands, Sonoran desertscrub, and Sinoloan thornscrub of extreme south-central Arizona and adjacent central Sonora, Mexico.

Extirpated from the U.S. around 1900, a population was established at the Buenos Aires National Wildlife Refuge in the southern Altar Valley in Pima County, Arizona. In 1996, Buenos Aires' masked bobwhite population was estimated at 300-500 birds. Three small natural populations, consisting of fewer than 1000 individuals, still persist in central Sonora, Mexico.

NORTHERN APLOMADO FALCON

Background. The northern aplomado falcon was listed as endangered January 25, 1986 without critical habitat (51 CFR 6686). A recovery plan was completed in June 1990. An experimental, nonessential population is allowed for primarily New Mexico but also for a portion of eastern Arizona. This would help with reestablishment of the species in these areas; however, no reintroductions will occur in Arizona (USDI-FWS 2006).

This falcon inhabits open grassland terrain with scattered trees, relatively low ground cover, suitable nesting platforms, particularly yuccas and mesquite and an abundance of small to medium-sized birds. Typical habitat ranges in elevation between 3,500 and 9,000 ft (1,189-2,743 m). The historical range in the U.S. was limited to southeastern Arizona (Cochise and Santa Cruz Counties), southern New Mexico and southern Texas. It is also found throughout most of Mexico south to Tierra del Fuego.

Distribution of the northern aplomado falcon is more limited today. In 1992, breeding populations in Chihuahua, Mexico approximately 80 miles south of the U.S./Mexico border were confirmed. Numerous sightings of falcons in southern New Mexico and west Texas have occurred over the years.

In Arizona, the last confirmed records of this species were from the Sulphur Springs Valley (1939), near Saint David (1940) and the border area near Rodeo, New Mexico (1977). In 2000, a breeding pair was observed near Deming, New Mexico and in 2002; breeding was confirmed in southern New Mexico.

YELLOW-BILLED CUCKOO

Background: The western distinct population segment (DPS) of the yellow-billed cuckoo was listed as a threatened in October 2014 (79 FR 5991). Critical habitat was proposed in August 2014.

The yellow-billed cuckoo (*Coccyzus americanus*) is a member of the avian family Cuculidae and is a Neotropical migrant bird that winters in South America and breeds in North America. One of several differences that distinguishes the western DPS is the arrival of birds on their breeding grounds approximately 4 to 8 weeks later than arrivals

in the eastern DPS (USDI 2014). Within Arizona, this results in the birds being present from early- to mid-June through mid- to late August⁷.

Breeding areas consist of dense woodlands along perennial drainages in western, central, and southeastern Arizona. While found in many of the historic drainages in which they were once common, cuckoos are now considered to be very localized in distribution (Corman and Wise-Gervais 2005).

NORTHERN MEXICAN GARTERSNAKE

Background: The northern Mexican gartersnake was listed as threatened in July 2014 (79 FR 38677). Critical habitat was proposed in July 2013 (78 FR 41550).

These gartersnakes, found along lentic and lotic systems from 3-5,000 feet in elevation, once inhabited major riparian areas throughout Arizona and western New Mexico⁸. They are primarily found in cienegas, marsh areas, desert, and lower oak woodland vegetation associations⁹.

Active during the warmer months each year, these snakes forage along water bodies, consuming frogs, toads, and their larvae, as well as fish, lizards, small rodents, and salamanders. The species breeds in April-May, giving birth to live young in July-August¹⁰.

Environmental Consequences – Threatened and Endangered Species

JAGUAR

Analysis of Effects. In Arizona, the decline of the species was concurrent with predator control that was associated with land settlement and development of the livestock industry. In the past, shooting has been a threat to jaguars in the U.S. At least 64 jaguars have been killed in Arizona since 1900 (Brown 1991, Girmendonk 1994), one as recently as 1986. Other impacts are clearing of preferred habitat, alteration and destruction of riparian areas, fragmentation or blocking of corridors that jaguars may use to move between Mexico and the U.S., and any trapping or animal control activities that target jaguars or other large predators.

Since 1996, jaguars have been photographed to the east of the project area. Given the proximity to these recent and historical sightings and the remote, rugged characteristics

⁷ <http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/YellowBilledCuckoo/WYBC-factsheet-southwestlearning.pdf>, accessed 2014

⁸ <http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Northern%20Mexican%20gartersnake%20RB.pdf>, accessed 2014

⁹ http://www.azgfd.com/w_c/edits/documents/Thameqme.fi_003.pdf, accessed 2014

¹⁰ http://www.azgfd.com/w_c/edits/documents/Thameqme.fi_003.pdf, accessed 2014

of the area and the wide-ranging habits of jaguars, the Lake Allotment is considered to have potential as travel corridors or hunting areas. The killing of jaguars is probably not as likely as in the past. The species is protected by state and federal regulations. Riparian areas in the project area are in fair or good condition and management practices identified under the proposed action are expected to maintain or improve these conditions. Further, the rough topography and heavy canopy cover characteristic of much of the analysis area limits livestock distribution, leaving many areas lightly grazed by cattle.

Effects Determination. The 2004 Framework criteria for the jaguar state:

No Effect

1. No accepted sightings (pursuant to the 1997 interagency Conservation Strategy for the Jaguar in Arizona and New Mexico) have been reported within the action area.

May Affect, Not Likely to Adversely Affect (must meet all of the of the criteria)

1. Grazing and livestock management activities will not reduce cover within riparian areas,
2. Livestock management activities will not permanently disrupt connectivity corridors within the U.S. and between the U.S. and Mexico.

The proposed action for the AMP includes features which are predicted to increase herbaceous cover in riparian bottoms in the analysis area. Livestock grazing within the project area will modify cover, but the degree of modification is not expected to be significant enough to affect jaguars or their prey. In addition, because of the presence of rough topography, heavy upland cover and remote terrain, jaguar movements would not be limited to riparian corridors. Nevertheless, there are historical records and recent records nearby, and the area supports suitable habitat. The likelihood of the species occurring in the project area is low, but cannot be ruled out. After considering this information, it is my determination that the proposed action *may affect, but is not likely to adversely affect* the jaguar on the Lake Allotment based on the following:

- Confirmed sightings have been reported east of the project area. There are corridors of suitable habitat to allow movement between some ranges in the U.S. and connectivity to suitable habitats may exist in Mexico. Over the term of the project there is a small likelihood that the species will occur in the project area.
- Proposed grazing and livestock management actions should not reduce cover in riparian areas and are projected to increase cover compared to existing conditions. Movements of jaguars are not restricted to riparian corridors.
- Livestock management activities will not permanently disrupt connectivity corridors within the U.S. and between the U.S. and Mexico or within the project area.

JAGUAR CRITICAL HABITAT

The US Fish and Wildlife Service (FWS) proposed jaguar critical habitat in 2012 (77 FR 50214) and revised in July 2013 (78 FR 39237). The Coronado National Forest (CNF) contains more than 50 percent of the jaguar proposed critical habitat distributed within the Peloncillo, Santa Rita, Tumacacori, Huachuca, and Whetstone Ecological Management Areas (EMAs). The CNF is proposing to continue livestock grazing activities within jaguar proposed critical habitat (PCH) on 78 Forest allotments and is requesting conferencing under the Endangered Species Act.

The jaguar proposed critical habitat is located in southeastern Arizona and a small portion in southwestern New Mexico totaling over 858,000 acres. The proposed critical habitat was divided into six units; Baboquivari, Atascosa, Patagonia, Whetstone, Peloncillo, and San Luis. The Coronado National Forest manages about 488,000 acres within the Atascosa, Patagonia, Whetstone, and Peloncillo Units.

Effects Determination

Designated critical habitat (257 acres) extends onto portions of the Lake Allotment in Bartolo Canyon East of the Arivaca Lake and Chimney Canyon, south of the Arivaca Lake. The no action alternative is the current management as described in the BA for Ongoing Livestock Grazing Activities in Jaguar Proposed Critical Habitat on the Coronado National Forest (USDA-FS 2013)

Based on the above assessment of direct, indirect, and cumulative effects, it is my determination that implementation of the continued livestock grazing on the Coronado National Forest will have “**No Effect**” on the following PCEs within jaguar proposed critical habitat. This determination is based on the following factors:

1. Livestock grazing or livestock management activities will not impede the jaguar movements to travel through CNF lands and maintain connectivity.
2. Livestock grazing or livestock management activities will not eliminate any naturally occurring water sources or exclude jaguars from the use of naturally occurring water sources or developed livestock water sources.
3. Livestock grazing or livestock management activities will not reduce canopy cover within Madrean evergreen woodland.
4. Livestock grazing or livestock management will not permit construction of structures, building roads, or conduct night-time lighting.
5. Livestock grazing or livestock management will not affect the terrain.
6. Livestock grazing or livestock management will not affect the elevation.

Based on the above assessment of direct, indirect, and cumulative effects, it is determined that implementation of the continued livestock grazing on the Coronado National Forest “**may affect, but not likely to adversely modify**” critical habitat (specifically PCE #2-native prey species within jaguar now designated critical habitat. This determination is based on the following factors:

- Livestock grazing removes herbaceous vegetation which may influence prey species abundance and/or distribution, but the effect on jaguar PCH is expected to be minor and not result any adverse habitat modifications.
- Adjacent lands are mostly used for livestock grazing and are managed similarly to livestock grazing on the CNF thus the cumulative effect may also influence prey species. We determined that the cumulative effect would not appreciably increase the effect on prey species and not result any adverse habitat modifications.

LESSER LONG-NOSED BAT

Analysis of Effects. Agave stalks are rich in carbohydrates, and as they begin to bolt are particularly palatable to domestic livestock and wild herbivores (Howell 1996). Agaves flower only once and then die. Livestock and wild herbivores feed on young agave stalks, which precludes the plant from flowering and potentially reduces forage resources for LLNB. By July, an agave inflorescence is too high to be grazed by cattle. No long-term investigation has quantitatively documented the effect of grazing on agave mortality or flowering stalk herbivory. Widmer and McClaran (2001) conducted a study of the effect of livestock grazing on *A. palmeri*. The results of their study show that: 1) overall herbivory on agave stalks was 56%, 2) 1/3 of emerging inflorescences were grazed at 70% on the sites, and 3) herbivory on agave stalks was 29% greater on sites grazed by livestock during the agave bolting season.

Determination of Effects. The 2004 Framework criteria for LLNB state:

No Effect (must meet one of the criteria)

1. Lesser long-nosed bats are not present within the action area (foraging distance of 40-miles from known roosts), **OR**
2. Within the range of the species, livestock grazing will not result in exposure to the species, and thus, no response.

May Effect, Not Likely to Adversely Affect (must meet all of the criteria)

1. Livestock grazing occurs in the action area and roost sites in the action area will be protected from disturbance or modification,
2. Construction of range improvements will not damage or destroy more than 1% of bat food plants within 0.5 miles of the project site (e.g., fences, stock tanks, etc.),
3. Within the range of the bat, and in the action area, livestock management will not destroy more than 1% of the agave flowering bolts during the flowering period to allow bolts to reach a height where livestock grazing on agaves is unlikely to occur. The flowering period may vary, but April 1 through June 15 can be used as a guide,
4. Within the range of the bat, in saguaro communities and in the action area, (as contained in desert scrub vegetation types), annual livestock grazing utilization will be maintained at conservative levels (see definitions). (Holcheck 1988).

Under the proposed action range improvements will be designed and implemented to avoid effects to agaves. Grazing will occur during a portion of the agave bolting season in selected pastures in the allotment, although seasonal deferments will assure that not all pastures are grazed in a given year. The exposure of bolting agaves to livestock will be similar to present levels, but the amount of herbivory on agaves cannot be predicted.

After considering the known information on the distribution and habitat requirements of the species, the distribution of potential habitats within the project area, and the Regional Framework Criteria, it is my determination that the proposed action *may affect, and is likely to adversely affect* the lesser long-nosed bat based on the following:

- Grazing will occur in pastures in the allotment between April 1 and June 15 resulting in a small but unquantifiable level of herbivory on agaves. In the absence of quantifiable data to the contrary, effects of grazing cannot be considered insignificant or discountable. No effects to roosts as a result of management activities are anticipated.

MASKED BOBWHITE

The 2004 Framework does not address the masked bobwhite.

The masked bobwhite do not occur on the Forest and the nearest population is over 10 miles to the west on the Buenos Aires National Wildlife Refuge. Utilization on this allotment is 35 per cent or less, allowing a continuing supply of food sources and brush cover. Considering the foregoing, it is determined that the effects of the proposed action will have *no effect* on the masked bobwhite.

NORTHERN APLOMADO FALCON

Analysis of effects. If aplomado falcons re-colonize or are augmented within their historic range on Forest Service land, livestock grazing could have adverse effects on nesting success and recovery of this species by direct destruction of nest trees. Disturbance effects of livestock management activities, beyond the presence of livestock, near nesting falcons could cause abandonment. Effects of over-utilization of forage on prey abundance, increases in desert scrub expansion into grasslands, yucca destruction and direct disturbance caused by grazing livestock could also be a concern.

Determination of Effects. The applicable Framework criteria for northern aplomado falcon state:

No Effect (must meet one of the criteria)

1. Aplomado falcons are not present within the action area.

May Affect, Not Likely to Adversely Affect (must meet all of the criteria)

1. In the action area, livestock grazing occurs in areas where the species may be present and a monitoring program is in place to determine responses of the habitat and the falcon to livestock grazing,

2. In the action area, areas of savannahs with yucca and scattered trees are being maintained for prey production and nesting habitat, including protecting all nesting substrate from adverse effects of livestock grazing and rubbing.

Southeast Arizona is a popular destination for birders from around the world and well as local residents. If aplomado falcons were to occur, either sporadically or permanently, in southeastern Arizona news of this would most certainly be reported on the Southeast Arizona Rare Bird Alert. To date, no aplomado falcons have been reported from Arizona. There are no immediate plans to reestablish this species in Arizona.

Based on the Framework criteria I have determined that livestock grazing on the Lake Allotment will have *no effect* on the northern aplomado falcon. This determination is based on the fact that no aplomado falcons are present in the action area.

CHIRICAHUA LEOPARD FROG

Background. The Chiricahua leopard frog (CLF) was listed as Threatened June 13, 2002 without critical habitat (67 FR 40790). In March 2012 critical habitat was designated however no critical habitat occurs on the Lake Allotment.

The Chiricahua leopard frog is found in central and southeastern Arizona, west-central and southwestern New Mexico and northern Mexico. The species was historically widely distributed on the Coronado, Gila, and Apache-Sitgreaves National Forests. The largest number of extant localities is on the CNF. On the Coronado, this species occurs at elevations of 3,281-6,600 ft (1,000-2,013 m). Leopard frogs as a group are habitat generalists that can adapt to a variety of wetland situations. Historical records of this species exist in stock tanks south of the project area. Recent records occur farther south and to the southeast of the allotment.

Threats to this species include predation by non-native bullfrogs, fishes, and crayfish; disease; drought; floods; degradation and destruction of habitat; water diversions and groundwater pumping; disruption of metapopulation dynamics increasing the chance of extirpation or extinction; and environmental contamination. Chytridiomycosis is a disease affecting amphibian populations globally and has been found in Chiricahua leopard frogs in Arizona and New Mexico.

Analysis of effects. Livestock grazing effects on Chiricahua leopard frog habitat can be beneficial or deleterious. Construction of stock tanks for livestock water has created leopard frog habitat, and in some cases has replaced destroyed or altered natural wetland habitats (Sredl and Saylor 1998). Sixty-three percent of extant Chiricahua leopard frog localities in Arizona are stock tanks; versus only 35% of extirpated localities (Sredl and Saylor 1998) suggesting Arizona populations of this species have fared better in stock tanks than in natural habitats. Stock tanks provide small patches of habitat that are often dynamic and subject to drying and elimination of frog populations. Adverse effects to the Chiricahua leopard frog and its habitat as a result of livestock grazing and management actions may include: facilitating dispersal of non-native predators; trampling of egg masses, tadpoles, and frogs; deterioration of watersheds; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of wetland and riparian vegetation and backwater pools; and spread of disease (U.S. Fish

and Wildlife Service 2002, Belsky *et al.* 1999, Hendrickson and Minckley 1984, Jancovich *et al.* 1997).

Cattle can remove bank line vegetation that provides escape cover for frogs and a source of insect prey. However, dense shoreline or emergent vegetation in the absence of grazing may favor some predators, such as garter snakes (*Thamnophis* spp.), and the frogs may benefit from some open ground for basking and foraging. On the other hand, heavy livestock use at stock tanks may result in degraded water quality (Sredl and Saylor 1998). Chytrid fungus can survive in wet or muddy environments and could conceivably be spread by livestock carrying mud on their hooves and moving among frog habitats.

Determination of Effects. The 2004 Framework criteria for Chiricahua leopard frog state:

No Effect (must meet all of the criteria)

1. Chiricahua leopard frogs are not present within the action area,
2. No livestock grazing or livestock management activities will occur within areas where frogs are reasonably certain to occur or where there is likely to be occupied habitat which includes:
 - a. Currently suitable habitat where the frog has been documented within the last 5 years, but is apparently now absent or,
 - b. Suitable habitat that is:
 - i. within 1 miles overland of occupied habitat,
 - ii. within 3 miles along an ephemeral or intermittent drainage from occupied habitat, or
 - iii. within 5 miles along a perennial stream from occupied habitat.

May Affect, Not Likely to Adversely Affect (must meet all of the criteria)

1. There will be no livestock use or livestock management activities in the action area, where the species may be present (grazing is allowed in non-occupied suitable habitat).
2. Indirect effects occurring within the action area, where the frog is reasonably certain to occur, which result from upland livestock grazing are determined to be insignificant or discountable.
3. Proposed livestock management activities within the action area will not increase the likelihood that non-native predators or chytrid fungi will colonize or be introduced to such aquatic sites.

There are no records, recent or historical, of Chiricahua leopard frogs on the Lake Allotment. The nearest suitable habitat for the Chiricahua leopard frog is Bolsa Tank, over 3 miles across land from the southern boundary of the Lake Allotment.

Nevertheless, the Forest will implement the Forest's Stockpond and Aquatic Habitat Management and Maintenance Guidelines for the Chiricahua leopard frog (*Rana chiricahuensis*) (PR 51). Based on the Framework criteria, I have determined that livestock grazing on the Lake Allotment will have *no effect* on the Chiricahua leopard frog.

Affected Environment - Forest Service Sensitive Species

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). The Regional Forester's list of sensitive plant and animal species was revised and updated in September 2007, and was the basis for the analysis.

CHIRICAHUA LEOPARD FROG CRITICAL HABITAT

The March 2012 final rule for the designation of critical habitat (CH) includes 39 CHUs across the range of the species in Arizona and New Mexico (U.S. Fish and Wildlife Service 2012). Approximately 31 percent of all CH for the Chiricahua leopard frog is located on five NFs in Region 3 (the Coronado, Gila, Tonto, Coconino, and Apache-Sitgreaves NFs).

The Coronado NF occurs in four recovery units (RUs) identified in the Chiricahua leopard frog recovery plan. Three breeding populations exist in RU 1 (Tumacacori-Atascosa-Pajarito Mountains, Arizona and Mexico) on the Coronado NF in the vicinity of the Lake Allotment. Sycamore Canyon is the only significant site with moving water in RU 1 to support breeding frogs. Most other sites are livestock tanks or impounded springs.

The Lake Allotment does not contain designated Chiricahua Leopard Frog Critical Habitat and, as such, the proposed action would have *no effect* upon it.

YELLOW-BILLED CUCKOO

Analysis of Effects. The primary cause of decline in WYBC numbers has been attributed to the loss and degradation of riparian woodland habitat and the invertebrate communities that they support. Noss et al. (1995) reported 85%-98% declines in the distribution of riparian ecosystems in the United States due to destruction, conversion, or significant degradation in structure, function, or composition, since settlement by Europeans. Overall, a 90% loss of presettlement riparian ecosystems has occurred in Arizona (Arizona State Parks 1988, Bogan et al. 1998). Corman and Wise-Gervais (2005) also site decreased water tables, replacement of native trees with nonnatives, poor grazing practices, and poor river management as causes for these declines in riparian habitat quality.

Determination of Effects. Of the 22 confirmed breeding areas observed by atlasers for the Arizona Breeding Bird Atlas, 11 of them (50%) occurred in Santa Cruz (5), Cochise (4), and southeast Pima Counties (2) (Corman and Wise-Gervais 2005). At least one of these confirmed breeding areas coincides with the location of the Lake Allotment. Based on vegetation conditions, the documented breeding event likely occurred in riparian habitat immediately adjacent to Arivaca Lake or in the drainage that feeds into it.

Grazing use of this allotment is primarily during the winter months rather than during the growing season. The potential for cattle and other grazing-related activities to disturb breeding cuckoos is low.

Vegetation within the allotment includes semi-desert grasslands, broadleaf evergreen woodlands, and chaparral. Within the grazed portion of the allotment, drainages are ephemeral, with surface water flowing only during the monsoon season. In the channels the water table could be shallow in areas or have subsurface flow that could sustain small areas or pockets of riparian vegetation (Riparian Condition report, PR). Recent range monitoring data using dry weight rank methodology indicate that soil conditions received a satisfactory rating (the highest rating possible), vegetation was considered in good condition, and that hydrologic function, soil and site stability, and nutrient cycling are intact on all three monitoring sites (Vegetation Condition report, PR). These monitoring results indicate that vegetation conditions remain stable and that excessive erosion is not occurring within or downstream from this allotment as a result of grazing. Therefore, no downstream impacts to the lake or adjacent riparian areas are expected.

The proposed action for the AMP includes features which are predicted to increase herbaceous cover in riparian bottoms in the analysis area. This alternative includes the potential for increased flexibility in timing and intensity of grazing, allowing for more focused grazing outside of the growing season. This may result in a slight increase in vegetation ground cover, which can in turn slow overland water flow and increase the amount of water percolating into soils and maintaining water table levels (Water Quality and Quantity, PR-17).

Considering the above analysis, it is my determination that the proposed action **may affect, but is not likely to adversely affect** the yellow-billed cuckoo based on the following:

- Yellow-billed cuckoos may occur within the riparian vegetation areas existing within the allotment.
- Primary cattle use occurs outside the main growing season, so modifications to vegetation structure are minimal, as are disturbances to breeding yellow-billed cuckoos.
- The proposed action includes measures intended to increase ground cover within the allotment, increasing water penetration into the soil and water table, as well as decreasing erosion potential.

YELLOW-BILLED CUCKOO CRITICAL HABITAT

In August 2014, a proposal for the designation of critical habitat (CH) was published (79 FR 48548). In this, the US Fish and Wildlife Service proposed designation as critical habitat of 546,335 acres across the range of the western DPS in 80 separate units in

Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah and Wyoming. Approximately 245,000 of the proposed acres occur within Arizona¹¹.

The Coronado NF occurs within the vicinity of proposed critical habitat for the yellow-billed cuckoo, though no Coronado lands fall within areas proposed for designation. Rather, these areas will be taken into account should downstream effects be possible.

The Lake Allotment does not contain proposed Critical Habitat for yellow-billed cuckoos. The nearest identified area is over 2.5 miles away from the Lake Allotment, and no downstream effects from grazing activities are expected (see vegetation and soil analysis under species analysis). There will be “**No effect**” to yellow-billed cuckoo proposed critical habitat.

NORTHERN MEXICAN GARTERSNAKE

Analysis of Effects: Threats include: 1) destruction and modification of its habitat; 2) predation from nonnative species; 3) significant reductions in its native prey base from predation and competition associations with nonnative species; 4) genetic effects from fragmentation of populations cause by the previous three threats listed. Of these, nonnative species’ presence may be considered the most harmful threat⁶.

Currently, northern Mexican gartersnakes are thought to occur in as little as 10% of their former range along major waterways in Arizona, and they may be extirpated in New Mexico⁷.

Effects Determination: Northern Mexican gartersnakes may occur adjacent to or within riparian areas within the Lake Allotment. Grazing use of this allotment is primarily during the winter months rather than during the growing season. Because these snakes are primarily inactive during this time, the potential for cattle and other grazing-related activities to disturb active gartersnakes is low.

Vegetation within the allotment includes semi-desert grasslands, broadleaf evergreen woodlands, and chaparral. Within the grazed portion of the allotment, drainages are ephemeral, with surface water flowing only during the monsoon season. In the channels the water table could be shallow in areas or have subsurface flow that could sustain small areas or pockets of riparian vegetation (Riparian Condition report, PR). Recent range monitoring data using dry weight rank methodology indicate that soil conditions received a satisfactory rating (the highest rating possible), vegetation was considered in good condition, and that hydrologic function, soil and site stability, and nutrient cycling are intact on all three monitoring sites (Vegetation Condition report, PR). These monitoring results indicate that vegetation conditions remain stable and that excessive erosion is not occurring within or downstream from this allotment as a result of grazing. Therefore, no downstream impacts to the lake or adjacent riparian areas are expected.

¹¹ <http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/YellowBilledCuckoo/NR-WYBC%20pCH-%202014%20Aug%2014%20FINAL%20AESO.pdf>, accessed 2014

The proposed action for the AMP includes features which are predicted to increase herbaceous cover in riparian bottoms in the analysis area. This alternative includes the potential for increased flexibility in timing and intensity of grazing, allowing for more focused grazing outside of the growing season. This may result in a slight increase in vegetation ground cover, which can in turn slow overland water flow and increase the amount of water percolating into soils and maintaining water table levels (Water Quality and Quantity, PR).

Considering the above analysis, it is my determination that the proposed action **may affect, but is not likely to adversely affect** the northern Mexican gartersnake based on the following:

- Northern Mexican gartersnakes may occur adjacent to or within riparian areas within the Lake Allotment.
- Primary cattle use occurs outside the main growing season, so modifications to vegetation structure are minimal, as are disturbances to active northern Mexican gartersnakes.
- The proposed action includes measures intended to increase ground cover within the allotment, increasing water penetration into the soil and water table, as well as decreasing erosion potential.

NORTHERN MEXICAN GARTERSNAKE CRITICAL HABITAT

In July 2013, a proposal for the designation of critical habitat (CH) for northern Mexican and narrow-headed gartersnakes was published (78 FR 41500). In this, the US Fish and Wildlife Service proposed designation as critical habitat of 421,423 acres across Arizona and New Mexico. This includes 912 stream miles slated for conservation¹².

The Lake Allotment does not contain proposed Critical Habitat for northern Mexican gartersnakes. However, private lands adjacent to the allotment are proposed as critical habitat. The allotment boundary fence prevents cattle from accessing the area, and no downstream effects from grazing activities are expected (see vegetation and soil analysis under species analysis). There will be “**No effect**” to northern Mexican gartersnake proposed critical habitat.

Environmental Consequences – Forest Service Sensitive Species

Birds

¹² http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/N-H_Gartersnake/2GS_pL&pCH_News_Release-final_7-9-13.pdf, accessed 2014

American peregrine falcon (*Falco peregrinus anatum*). No active eyries are known from the project area, but there are historical records of falcons nesting at Cerro del Fresnal on the Fresnal allotment. The project area could be used throughout the year by birds wintering or migrating through the area. 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). Grazing may affect peregrine falcons if grazing effects are sufficient to change plant species composition and vegetative structure. Changes in these parameters could change the habitat suitability for primary prey species (songbirds). Generally, reductions in plant species composition and structure would result in corresponding reductions in prey species diversity and abundance. Grazing effects that lead to a more heterogeneous plant community would, in general, result in a greater diversity and abundance of prey.

No potentially disturbing activities are planned in the vicinity of existing eyries, so no direct impacts to peregrine falcons are anticipated as a result of any of the project alternatives. Based on the foregoing, the proposed action will *not affect* peregrine falcon.

Northern gray hawk (*Asturina nitida maxima*). Gray hawks are migratory and usually arrive in Arizona in mid-March. They occur in riparian woodlands with large cottonwoods, usually near mesquite forests. Nests are usually placed in the upper third of the canopy and are constructed of leafy green twigs from the nest tree. The birds feed on lizards and small mammals (AGFD 1999a). The primary threat to the species is disturbance at nest sites or from other ground-disturbing or loud activities that take place during the nesting season (May-August). Grazing may affect northern gray hawks if grazing effects are sufficient to change plant species composition and vegetative structure. Changes in these parameters could change the habitat suitability for prey species or result in the death of large nesting trees. No potentially disturbing activities are planned in the vicinity of existing nests, so no direct impacts to northern gray hawks are anticipated as a result of any of the project alternatives. Based on the foregoing, the proposed action will *not affect* northern gray hawk.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). This species requires streamside cottonwood, willow groves, and larger mesquite bosques for migrating and breeding. There are no known observations of the species from this allotment and no cottonwood/willow habitats. Deciduous riparian vegetation is limited to sycamore and Arizona walnut in the form of individual trees or small stands. Thus, potential habitat is largely lacking on the project area. Based on the foregoing, the proposed action *will not affect* western yellow-billed cuckoo.

Reptiles

Giant spotted whiptail (*Cnemidophorus burti stictogrammus*) This lizard inhabits mountain canyons, arroyos and mesas in arid and semi-arid regions from near sea level to 4,500 feet (1370 meters) elevation (2001a). It is found in dense shrubby vegetation, often among rocks near permanent and intermittent streams or in open areas of bunch grasses in riparian habitats. The Arizona Game and Fish Department allows collecting of up to 20 individuals of this species per day. Although it may be locally abundant and the population is thought to be stable over collecting may have more of an impact on this

species than grazing. Grazing, however, may affect giant spotted whiptails if it causes habitat degradation or changes in vegetation composition. Based on the foregoing, the proposed action *may affect individuals of giant spotted whiptail but is not likely to result in a trend toward federal listing or loss of viability.*

Plants

Large-flowered blue star (*Amsonia grandiflora*) This suffrutescent perennial occurs in canyon bottoms in oak woodlands dominated by Emory oak and Mexican blue oak at elevations of 3,900 to 4,500 feet (AGFD 2001a). Preferred substrates are rocky alluvial soils. A total of 15 to 20 populations distributed throughout the Tumacacori and Huachuca EMAs comprise the entire known distribution of the species. Populations appear relatively stable with low mortality and recruitment. The species is not palatable to livestock, so grazing impacts are minor even where it occurs (AGFD 1998a). Based on the foregoing, the proposed action will have *no affect* on large-flowered blue star.

Lumholtz nightshade (*Solanum lumholtzianum*) This annual herb occurs in washes, along stream banks and low, wet ground near wet depressions at 3,000-4,600 feet (900-1380 meters) elevation (AGFD 2000). Many species in the genus *Solanum* contain toxic alkaloids, especially the berries, and are poisonous to livestock. It is not known if this species contains toxic alkaloids. Plants may be impacted by degradation of habitat by livestock grazing but it is not known if this species is browsed by livestock. Based on the foregoing, the proposed action *may affect individuals of Lumholtz nightshade but is not likely to result in a trend toward federal listing or loss of viability.*

Santa Cruz beehive cactus (*Coryphantha recurvata*) This cactus occurs on alluvial soils of valleys and foothills in grassland and oak woodland at 4,000-6,000 feet (1220-1830 meters) elevation. Plants prefer rocky hillsides with good grass cover or rock crevices where runoff accumulates and provides extra moisture. Accessible populations are declining due to collection. Road construction and maintenance and livestock grazing may contribute to habitat degradation (AGFD 1998b). Based on the foregoing, the proposed action *may affect individuals of Santa Cruz beehive cactus but is not likely to result in a trend toward federal listing or loss of viability.*

Santa Cruz striped agave (*Agave parviflora parviflora*) This small agave occurs at middle elevations of mountains on rocky or gravelly slopes and ridges, in desert grassland or oak woodland at 3,900-4,800 feet (1170-1440 meters) elevation. It prefers rounded ridge-tops where grasses and shrubs are sparse and soil is bare or nearly so. Some populations appear to have declined due to collection and loss of habitat due to mining and road construction. Grazing may cause degradation of habitat. The flower stalks are relished by livestock and reproduction may be reduced by browsing (AGFD 1997). Based on the foregoing, the proposed action *may affect individuals of Santa Cruz striped agave but is not likely to result in a trend toward federal listing or loss of viability.*

Supine bean (*Macroptilium supinum*) This perennial herb occurs on ridge-tops and gentle slopes in semi-desert grassland or grassy openings in oak-juniper woodland from 3,600-4,900 feet (1080-1470 meters) elevation. Possible threats include degradation of habitat due to livestock grazing, off-road vehicle activity, recreation, utility corridor and

road construction and Border Patrol activities. It is browsed by rodents and livestock (AGFD 1999). Based on the foregoing, the proposed action *may affect individuals* of supine bean *but is not likely to result in a trend toward federal listing or loss of viability*.

Invertebrates

A tiger beetle (*Amblycheila baroni*). This nocturnal tiger beetle feeds on a variety of insects and other arthropods. It is found throughout the Coronado National Forest in oak, juniper and mixed grasses at elevations of 3,500 to 5,500 feet. The species is active during the late summer after the onset of summer rains. The species is described as widespread and abundant where it is found (AGFD 2001b). Effects from livestock grazing are limited to accidental trampling of individuals. Based on the foregoing, the proposed action *may affect individuals* of a tiger beetle *but is not likely to result in a trend toward federal listing or loss of viability*.

Arizona Giant Skipper (*Agathymus aryxna*), Poling's giant skipper (*Agathymus polingi*) and Ursine giant skipper (*Agathymus ursus ursus*)

These species occur throughout the Coronado National Forest in suitable habitats containing their preferred food plants: *Agave palmeri* for *A. aryxna*, *Agave shottii* for *A. polingi* and various species of *Yucca* for *A. ursus* (AGFD 2001c, 2001d). Adults fly from early September to mid-November and adult males are attracted to mud. Eggs are laid on the food plant and the larvae live and hibernate on the agave leaves. Possible effects from livestock grazing include the removal or disturbance of food plants or the trampling of adults in muddy areas. The butterflies and their host plant are widespread in southeastern Arizona and well distributed in the analysis area. Based on the foregoing, the proposed action *may affect individuals* of these three species *but is not likely to result in a trend toward federal listing or loss of viability*.

Arizona metalmark (*Calephelis arizonensis*). This species is known year-round from throughout southeastern Arizona where it is found near the bases of the mountains up off of the desert floor and in riparian bottoms where the host plant, *Bidens* sp. (beggarticks), is found (AGFD 2001e). *Bidens* is a plant of riparian affinity and most suitable Arizona metalmark habitats have a source of permanent or semi-permanent water nearby. It is not known whether *Bidens* occurs within the analysis area; and permanent water other than stock tanks is limited. Possible effects to the species would involve removal of the host plant through grazing. Based on the limited suitable habitat within the analysis area, implementation of the proposed action *may affect individuals* of Arizona metalmark *but is not likely to result in a trend toward federal listing or loss of viability*.

Affected Environment - Management Indicator Species

Forest Plan direction for Management Indicator Species (MIS) is to maintain or improve occupied habitat (PR 1). Forest-wide trends of all MIS have been assessed and are reported in the Forest-wide Status Report for Management Indicator Species (USDA-FS 2006, PR 36). The background information and conclusions of this report are incorporated by reference.

Environmental Consequences – Management Indicator Species

Black bear

In Arizona, the black bear is found in most woodland habitats, including pinyon-juniper, oak woodland, coniferous forest, and chaparral. Black bears are normally solitary animals, except for family groups (mother and cubs), breeding pairs, and congregations at feeding sites. Black bears are known to move long distances (100 miles) to exploit isolated pockets of food. The mobility of black bears sometimes leads them to appear in uncharacteristic habitats and to return from long distances after being moved. Most Arizona black bears hibernate from November through March, during which time they reduce body temperature, heart rate, and metabolic function, while still remaining somewhat alert in the winter den. Cubs are born during January in winter dens, usually in pairs, but larger litters are not uncommon. Black bears are omnivorous, feeding on a wide variety of plant and animal material including fruits, berries, acorns, roots, bulbs, insects, fish, rodents and carrion. There is little to no competition between cattle and bears for food or habitat. Based on the foregoing, the proposed action may affect this species but will not lead to a loss of viability.

White-tailed deer

White-tailed deer occupy relatively rough, wooded terrain with steep canyons. Typical whitetail habitat is mixed oak woodland, but they can be found anywhere from ponderosa pine/mixed conifer at 10,000 feet down to the upper limits of semi-desert grassland. Although elevations with the highest deer densities vary among different mountain ranges, most white-tails are found between 4,000 and 7,000 feet. Most of their life is spent in a small home range of about one square mile. They feed on green plants, acorns, brush and twigs. Deer and cattle occupy similar habitats but tend to forage on different plant materials. Based on the foregoing, the proposed action may affect this species but will not lead to a loss of viability.

Cavity nesters

Cavity nesters include many bird species including woodpeckers, trogons, flycatchers, wrens, titmice as well as several mammal species including squirrels and raccoons. These species build nests in tree cavities for raising young and the adults may also use cavities for permanent or temporary homes. Cattle grazing does not normally reduce the number of suitable cavities but may alter the vegetation community. Changes in vegetation may result in changes in the insect, small mammal and reptile populations which cavity nesters rely on for food. Based on the foregoing, the proposed action may affect cavity nesting species but will not lead to a loss of viability.

Vegetation Condition

Affected Environment

Grazing by domestic livestock may impact vegetation by changing the mix of species in the plant community being grazed (vegetation composition), by changing the density and frequency of perennial forage plants, and by changing the vigor of the grazed plants. Rangeland condition is an expression of the degree to which the composition, frequency

and vigor of plants in a community resemble the climax plant community for that site. Measurements of these three vegetation parameters are used to place range sites into vegetation condition classes that reflect the relative effects of grazing on vegetation.

The project area falls within the Range Woodlands Land Resource Unit as defined by the Natural Resource Conservation Service (NRCS). The monitoring transects are located at the upper end of the 12-16 inch precipitation zone (PZ) or the lower end of the 16-20 inch PZ in the NRCS Southeast Arizona Basin and Range Major Land Resource Areas (MLRA) 41-1 and 41-3. The 12-16 inch PZ Ecological Site Guides were used for data analysis. The closest weather stations are located in Nogales, Arizona, and on the Santa Rita Experimental Range (SRER). Average summer growing season (July – September) rainfall for the Nogales 6N weather station from 1952-2005 was 10 inches. The SRER is primarily in the NRCS 12-16 inch precipitation zone, but includes gages in the 16-20 PZ. Average summer 2008 precipitation on the SRER was 11.27 inches¹.

The reference range sites used to describe the potential natural community for the purpose of determining rangeland condition include Shallow Uplands, and Loamy Upland in the 12-16 inch precipitation zones. Rangeland vegetation was assessed in 2008 by the Forest Service using the dry weight rank methodology (PR 21). Monitoring results are summarized below.

Data collected at three permanent monitoring locations indicate that the allotment is generally in good condition. Indicators of soil condition such as the amount of bare ground and litter show positive trends, but vegetation composition is unlikely to change in the absence of fire. Vegetation condition based on the NRCS similarity index was good for all three monitoring transects. Soil condition on all the monitoring sites was satisfactory, the highest category according to the NRCS Soil Condition Rating Guide. This indicates that hydrologic function, soil and site stability, and nutrient cycling are intact on these sites.

Non-native Lehmann lovegrass was present in small amounts on two transects (18% and 6%). Lehmann lovegrass can be invasive, although it is palatable for livestock and provides good soil production. The NRCS range condition rating gives no credit for non-native species, resulting in lower scores if non-native grasses increase.

Environmental Consequences

Monitoring indicates that most sites within the project area are at or near their ecological potential or that conditions are affected by high tree densities and canopy closure. Under *Alternative 1* woody species would likely continue to suppress condition, because a shift in species composition is needed for some areas to reach high condition. Thus many areas would probably remain in good condition in the absence of more intensive management such as burning or mechanical treatment that would open up the canopy. 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 would provide fine fuels that will allow fire to play a more natural role in the area. The re-establishment of a more natural fire regime could reduce the density of woody species such as mesquite that currently suppress herbaceous production.

Under Alternative 2 (Proposed Action), as in Alternative 1; woody species would likely continue to suppress condition ratings, because a shift in species composition is needed for some areas to reach a high condition score. Thus many areas would probably remain in good condition in the absence of more intensive management such as burning or mechanical treatment that would open up the canopy will provide flexibility to adjust to changing forage conditions. Proposed utilization objectives of 30-45% in uplands would maintain plant density and vigor over the term of the analysis, especially since use is expected to occur 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. Annual growing season rest on all of the allotment and regular rest or deferment would allow for growth and reproduction of perennial grasses each summer. Management alone may not be sufficient to result in significant changes, since a shift in species composition would be necessary.

Riparian Condition

Affected Environment

The Forests plan has classified the allotment entirely within Management Area 4, the general multi-resource use area. The mapped riparian area is limited to Arivaca Lake and Arivaca Creek which is downstream from the lake dam. Arivaca Lake is managed and owned by the Arizona Game and Fish Department. The lake is currently mapped as a wetland by the U.S Fish and Wildlife Service. Although water levels have fluctuated greatly due to drought conditions several riparian species have persisted surrounding the lake such as velvet ash (*Fraxinus velutina*) and willow (*Salix spp.*)

All drainages in the allotment have surface water flowing only during the monsoon season (ephemeral streams) or periodically for short durations. None of the drainages support year round surface water flow (perennial). In the channels the water table could be shallow in areas or have subsurface flow that could sustain small areas or pockets of riparian vegetation.

The analysis of riparian area condition is based primarily from on-the-ground observations, aerial photo interpretation, the corporate GIS database layers, and the Land Resource Management Plan for the Coronado National Forest (Forest Plan).

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, roads and campgrounds occur in drainage bottoms, foot and traffic would continue to affect soils.

Under *Alternative 2*, livestock management practices would maintain the existing conditions of the channels, which currently support small pockets of riparian vegetation in the channels throughout the allotment. Based on the emphasis on winter use and light to moderate use levels proposed, riparian areas would continue to meet or move toward forest plan standards.

Soil Condition

Affected Environment

The geology underlying the project area is diverse. Rhyolite is located in the eastern portion of the allotment, sedimentary rock is located in the western portion, and a narrow section of alluvium is located in main channels along Chiminea and Cedar Canyons and in the Northwest corner of the allotment. In general, the soils are shallow to deep very cobbly to extremely cobbly sandy loams with numerous rock outcrops.

Soil condition field monitoring has been ongoing for years and the latest information was collected in 2010 (Table 5). The allotment was evaluated using protocols from Forest Service Soil Management (FSH 2509.18-99-1 R3 Supplement titled Soil Management Handbook). Interpretations of soil condition are based on site visits, historical livestock use patterns, soil properties, Digital Elevation Models (DEM), Aerial photos and slope characteristics. Small areas of impaired soils are identified on the allotment. The acres that are impaired are located near the old ranch headquarters and are gentle in terrain. These soils have a reduced ability to function properly, characterized by a blocky structure and moderately few roots in the surface horizon. The cause for this is currently not clear. Compaction and a poor plant community would be the expected effect of that circumstance.

Table 3. Soil Condition, Lake Allotment.

Allotment	Acres in Satisfactory Soil Condition	Acres in Impaired Soil Condition	Total	% Impaired
Lake	2,486	254	2,740	9%

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 time soil bulk density and structure would return to natural levels, but changes would be slow. Areas of impaired soils on the Lake Allotment would persist for several years. Under *Alternative 2*, growing

season rest and light to moderate utilization should maintain adequate vegetation cover and contribute to satisfactory nutrient cycling and soil structure. Areas with satisfactory soils should remain satisfactory. On impaired soils, bulk density and soil structure will continue to be altered by grazing livestock to some degree, but current positive trends are expected to continue. 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. Changes in the vegetation community observed on the Lake allotment will be difficult to reverse in the absence of fire or more intensive vegetation treatments. Nutrient cycling and soil structure may continue to be impaired even under light grazing. Monitoring actions identified under the proposed action and adaptive management strategies will allow more flexibility in herd management.

Water Quantity and Quality

Affected Environment

The allotment lies entirely within the Arivaca Creek Fifth Code Watersheds (1505030401). The watershed is approximately 89,250 acres and the Lake Allotment makes up approximately 3% of the total acres of the watershed. Average precipitation at the nearby City of Nogales is about 18 inches (Western Regional Climate Center web site).

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. The general classifications used for surface water quality by the ADEQ are attaining and impaired for all uses specified and not assessed. Currently water quality has been assessed within the allotment only in Arivaca Lake. Water quality in the lake has been found to be impaired for fish consumption due to mercury in the flesh of the fish caught in Arivaca Lake. Water quantity (surface water yield) is controlled by annual precipitation and hydrologic conditions on the watershed. Hydrologic conditions are in turn influenced by vegetation type and density on the watershed and soil condition. Adequate cover in the form of standing vegetation and litter is necessary to intercept raindrops and arrest the overland flow of water. Soils that have been degraded through compaction or erosion cannot effectively capture, hold and release water. On compromised watersheds, water quantity in the form of runoff increases due to a compromised hydrologic function. The result is generally an increase in peak flow discharges (flooding).

Environmental Consequences

Water Quality. 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. 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 potential increase of VGC and elimination of livestock-caused soil compaction would contribute to an incremental improvement in hydrological function resulting in less runoff, better infiltration and an

improvement in water quality due to less sediment and lower turbidity. It is important to note that the impaired soil area is downstream from all areas tributary to Arivaca Lake, and choosing this alternative will have no effects on Arivaca Lake water quantity or water quality."

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. It is important to note that the impaired soil area is downstream from all areas tributary to Arivaca Lake, and choosing this alternative will have no effects on Arivaca Lake water quantity or water quality."

Water Quantity. Under *Alternative 1*, adequate vegetation groundcover would contribute to satisfactory 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.

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 resulting from 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

The project area does not contain designated wilderness, eligible wild and Scenic River segments, research natural areas, zoological botanical areas or other areas that would require special management by regulation or Forest Plan direction. Portions of the project area fall within mapped an inventoried roadless area (PR 27). Roadless areas largely consist of steep slopes at higher elevations throughout the range.

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 dependent 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

The construction of new roads or the maintenance or reconstruction of existing roads is not proposed or anticipated. Proposed facilities outside of the IRA will be accessed using existing roads. Neither road construction nor cross-country travel would be required or permitted in order to access sites within the IRA. Because no road construction or maintenance would occur, there would be no effect to the roadless status of the IRA.

Soil and vegetation disturbance associated with facility construction would occur in the immediate vicinity of new developments. Additional effects would be limited to shortterm noise disturbance associated with the transportation of the materials and construction of the improvements. Managed seasonal livestock grazing will continue within portions of the IRA at moderate levels under the proposed action (30-45% utilization, primarily winter seasonal use). As documented elsewhere in this EA, the limited intensity and duration of grazing is not expected to result in adverse effects to soil, air, water, wildlife and plants, or traditional cultural properties. Therefore, no effects to the roadless characteristics of the area are anticipated.

Based on the above discussion, there will be no direct or indirect effects on the roadless status or characteristics of the IRA in the Tumáacori EMA around Bartolo Mountain. Because there are no direct or indirect effects, cumulative effects are precluded. No other activities have been identified that would contribute cumulatively to the effects of the action.

Heritage Resources

Affected Environment

The Nogales Ranger District of the Coronado National Forest has proposed adopting an allotment management plan (AMPs) for the Lake allotment. It is Forest Service policy to make forage from lands suitable for grazing available to qualified livestock operators when consistent with the goals, objectives, standards, and guidelines of Land and Resource Management Plans (LRMPs). The proposed AMP is intended to authorize and manage grazing in the allotment to this end. This report has been prepared in order to assess the potential effects that the proposed AMP would have upon heritage resources.

Culture History & Historical Background

General overviews of southeastern Arizona are given by Bronitsky and Merritt (1986), Whittlesey et al. (1994), and Wilson (1995). On the whole, precontact archaeological sites are relatively scarce throughout the rugged Atascosa, Pajarito, and San Luis mountains in the borderland west of the Santa Cruz Valley. And though the Lake Allotment is technically within the boundaries of two historic mining districts, the Arivaca (Pima County) and Oro Blanco (Santa Cruz County), no historic mines are documented within the allotment (Keith 1974 and 1975).

Previous Heritage Research & Survey Results

Records review shows that no archaeological surveys have been completed on the allotment and no heritage resource sites have been recorded. As stated above, no new range constructions are proposed at this time. Therefore, no heritage resource inventory survey was made for the currently proposed EA.

Heritage Resource Management Practices and Recommendations

The objective is to protect heritage resources (historic and prehistoric sites) from impacts caused by range construction projects or livestock concentration. To mitigate impacts to Heritage Resources, the following management practices will be implemented. These practices have been used on previous projects and are determined to be effective at reducing impacts and are consistent with applicable Forest Plan standards and guidelines.

- Before any range facilities are constructed, the Forest Archeologist will be contacted to determine if archeological survey is needed. All proposed range facilities will be surveyed by qualified personnel for heritage resources prior to any ground-disturbing activities. Facilities will be located to avoid impacts to heritage resources.
- If unrecorded sites are discovered during the course of project implementation, activities will cease and the Forest Archeologist will be notified.
- No salting will occur within or adjacent to identified heritage sites.
- If impacts from grazing (e.g. excessive trampling, cattle rubbing against and knocking down standing features) are occurring to heritage sites, measures will be taken (e.g. fencing) to protect them.

Any future improvements and other ground-disturbing management practices will be contingent upon completion of the identification and protection of historic properties and compliance with applicable provisions of the National Historic Preservation Act. Given this provision, the adoption of the proposed AMP will have a determination of No Historic Properties Affected – No Properties Present and heritage resources clearance is recommended.

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 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.

Economics

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 ranches in surrounding area. 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 allotment is located primarily in Pima County, Arizona. Tourism and financial services are growing segments of the economy of Pima County. Farm and ranch employment is considered an important segment of the economy, but total agricultural employment (farming and ranching) accounted for 2.4% of the economy in 2010 (Headwaters Economics 2007). Ranching operations in the area tend to be characterized by small profit margins with the need for off-ranch supplemental income to continue operations.

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, but given the size and economic diversity of Pima and Santa Cruz Counties, these effects are considered insignificant in this case.

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 to maintain ranching operations. Typically, 25% of these receipts are returned to the Forest in the form of Range Betterment Funds used to construct range improvements. These funds (approximately \$1,300/year under full stocking) would not be available to the Forest Service under *Alternative 1*.

There would be no costs associated with new range facilities as none are proposed. There would, however, still be costs associated with management of the allotments and maintenance of facilities. 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.

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

Cumulative Effects

Cumulative effects are the past, present and reasonably foreseeable future actions that add to the direct and indirect effects considered in this EA. The following activities have been identified as potentially contributing to the effects analyzed herein. These activities and occurrences have contributed incrementally to changes in ecological conditions in the project area and may continue to influence conditions in the project area over the term of the project. Foreseeable future actions are those for which a proposed action has been

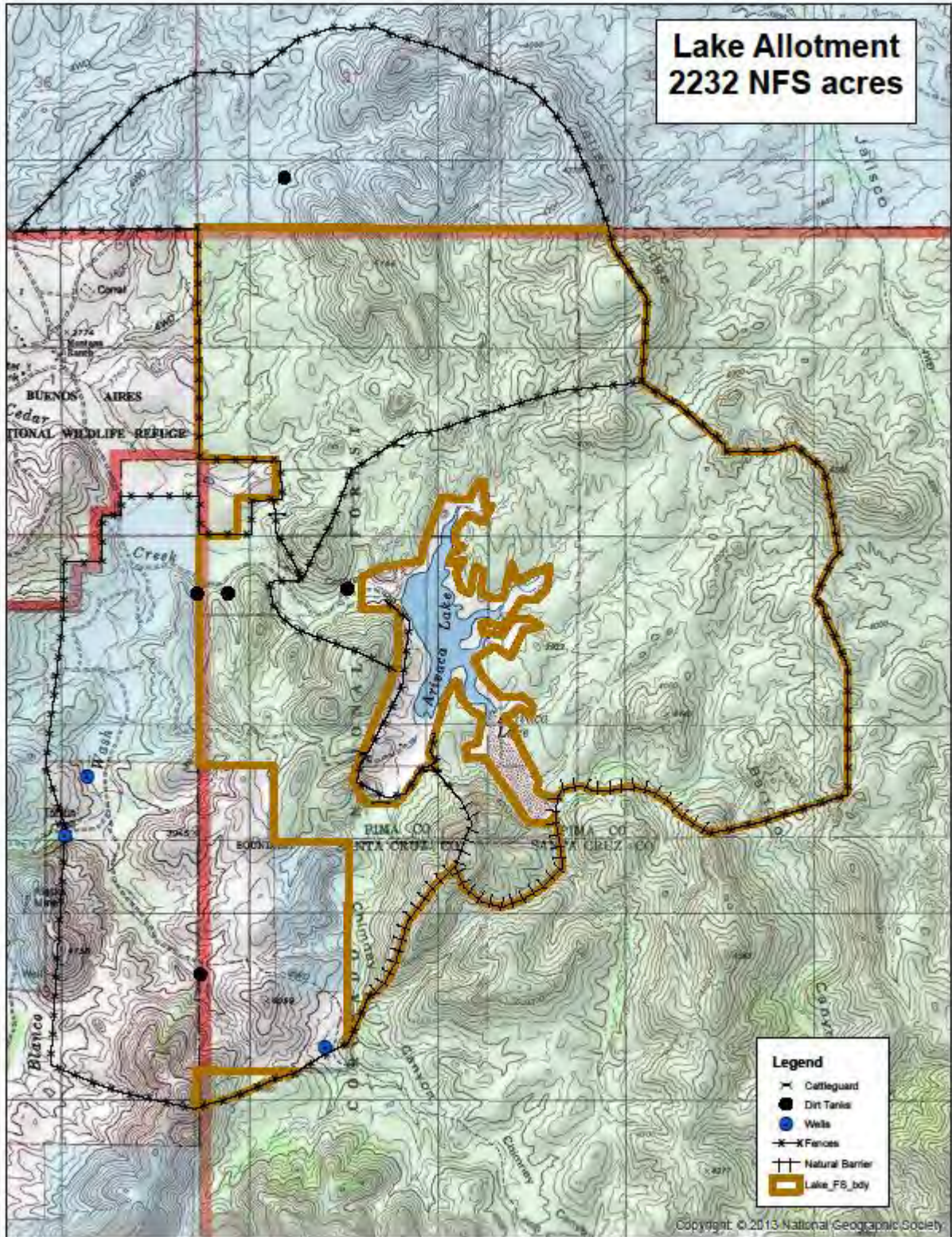
approved or those proposed for NEPA analysis in the future. Other possible future actions are considered too speculative to include in this analysis.

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

Human Activities. Authorized activities in the project area include camping, hiking, hunting, wildlife watching, fishing 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 in popular bird watching spots.

Portions of the area show substantial evidence of trailing by undocumented aliens and/or drug traffickers. The effects of these activities include accumulations of trash, creation of wildcat foot and vehicle trails and vandalism of range improvements, especially fences. In addition, the area has seen a substantial but unquantified increase in vehicle traffic related to interdiction efforts on the part of the U.S. Border Patrol and other enforcement agencies. The effects of border crossing activities are largely outside of the control of the Forest Service and the permittees, but they are likely to require additional efforts to maintain improvements and adhere to a rotation schedule.

These facilities and activities will continue to result in short term and relatively minor effects to soils and hydrology and wildlife, especially where activities are concentrated in drainage bottoms. However, because no significant direct or indirect effects of the proposed action and alternative are anticipated, neither of the alternatives is expected to contribute significant cumulative effects.



4. CONSULTATION AND COORDINATION

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Sean Lockwood, Team Leader	Team Leader, Writer/Editor
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Sharon Biedenbender and Justin Maloney Range Conservationists and Range Technician, Nogales Ranger District	Vegetation Analysis
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Robert LeFevre, Hydrologist/Forester (Retired)	Soils, Air, Water, Riparian Analysis
Sean Lockwood, Team Leader	Economics
Chris LeBlanc and Bill Gillespie, Archeologists, Supervisor's Office	Heritage Resource Analysis

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

OTHERS:

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

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APPENDIX A: BEST MANAGEMENT PRACTICES

Taken from Forest Service Handbook: 2509.22 – (R3) Soil and Water Conservation Practices Handbook, Southwest Region Directive
Chapter 20: Resource Management Activities

22 - RANGE MANAGEMENT.

The use of National Forest System (NFS) lands for grazing in the Southwestern Region generally predates the establishment of individual Forests. Grazing continues as a recognized tool for vegetation management on NFS lands and is considered a compatible use of public lands. Designated ranges are managed to accommodate grazing along with other uses. NFS rangelands are divided into allotments for administration. Allotments are used by rancher permittees who pay a mandated fee for each month of use for each animal (and its 6 month or older offspring).

Range vegetation management involves such activities as range analysis, allotment management planning and improvement, and a grazing permit system. It includes controlling overall livestock numbers, season of use, livestock distribution, constructing structural and non-structural improvements, maintaining or enhancing diverse landscapes for the benefit of the overall biological aspects of the ecosystem including fish and wildlife and other resources, and restoration of deteriorated rangelands. The actual physical activities include grazing, trampling, ponding, salting, fencing, sediment traps, fuelwooding, prescribed burning, using herbicides, site preparation, seeding, and other activities associated with forage establishment. Livestock can be an effective tool in managing vegetation.

Successful range vegetation management is measured by the results on-the-ground through production utilization surveys (range inspections) and compared to the environmental protection attainment identified and addressed in range analyzes and allotment plans made by interdisciplinary teams through the IRM process.

Water and soil management concerns can be effectively included into the Range Management Planning Process when the Allotment Management Plan is written or revised. Allotment planning is accomplished using the Region's IRM process and must be consistent with the Forest's Land Management Plan.

22.1 - Range Analysis, Allotment Management Plan, Grazing Permit System, and Permittee Operating Plan.

1. Objective. To manage rangelands through IRM and ensure they are meeting Forest Land Management Plan objectives.
2. Explanation. An analysis of a potential and/or existing grazing area is conducted by an interdisciplinary team to evaluate its productive capabilities, inherent hazards, resource values, and uses for the purpose of meeting Forest Land Management Plan objectives. Following this analysis the Forest Service, in cooperation with the permittee,

prepares a written allotment management plan and authorizes livestock grazing as per stipulations in the management plan. These documents include measures to protect other resource values, such as water quality, riparian area resource management, and to coordinate livestock grazing with other resource uses. Specific methods for controlling when, where, amount of utilization, and numbers of livestock to be grazed are covered in the plan. Also included are needed rangeland improvements, monitoring methods, and an implementation schedule.

A permittee operating plan is prepared, reviewed, and revised annually to reflect direction in the allotment management plan.

The amount of livestock use is determined primarily through measurement of vegetative utilization.

Allowable use is set to meet the objectives of the Forest Land Management Plan. The maintenance of soil productivity and stability is considered in determining allowable use.

3. Implementation. The District Ranger is responsible for analysis of range allotments, completion of environmental assessment reports, preparation of management plans, and processing of grazing applications. The Forest Supervisor or District Ranger approves management plans and issues grazing permits with stipulations and conditions. Most permits are issued for 10 year terms. Revise allotment management plans as needed to meet the Forest Land Management Plan objectives.

Annually prepare a operating plan with the permittee to allow for current allotment conditions. The permittee carries out the plans under the immediate direction and review of the District Ranger. Take corrective action if a permittee does not comply with grazing permit conditions designed to protect soil and water resources.

22.11 - Controlling Livestock Numbers and Season of Use.

1. Objective. Safeguard water and soil resources under sustained forage production. Managed forage utilization by livestock to maintain healthy ecosystems for all resource objectives.
2. Explanation. In addition to proper stocking rate and season of use specified in the grazing permit, periodic field checks are made to identify needed adjustments in season and livestock numbers. Checks include:
 - a. Range readiness evaluations to assure that the soil is not too wet and that sufficient forage growth has occurred.
 - b. Stock counts to assure that only permitted livestock enter the allotment.
 - c. Forage utilization measurements to provide data, for grazing use pattern, improved livestock distribution, and stocking.
 - d. Assessment of rangeland to verify soil and vegetative condition and trend.
 - e. Assessment of streambanks to assure banks are not being degraded and contributing sediment to water courses.When standards for allowable utilization are established they are incorporated into the allotment management plan.
3. Implementation. Allotments are administered by the District Ranger. Provisions are carried out by the grazing permittee as permit requirements. Field check and measurements are made periodically by the Forest Service. Livestock numbers and seasons of use may be changed annually to reflect current years climatic condition.

22.12 - Controlling Livestock Distribution.

1. Objective. To manage sustained forage production and forage utilization by livestock while protecting soil and water resources. Maintaining healthy ecosystems for wildlife and other resources.
2. Explanation. Livestock use within allotments is typically not uniform due to variations in topography, water availability, vegetation type and condition. Several techniques are used to achieve proper distribution, or lessen the impact on areas which are sensitive or which would naturally be overused. These techniques include:
 - a. Construction of fences, and implementation of seasonal or pasture systems of management.
 - b. Water development in areas that receive little use and closing off water developments when proper use has been achieved.
 - c. Riding and herding to shift livestock locations.
 - d. Using salt or supplement feed as tools to gain proper distribution of livestock.
 - e. Range improvements, prescribed burning, trail construction, or seeding.
 - f. Prevention of intensive livestock grazing or concentrated livestock use on soils that have low bearing strength and are wet.

Open herding, limiting trailing, and use of new bed grounds are additional techniques used for sheep. Developing sufficient watering places is one way to limit the amount of trailing. Livestock distribution needs are determined through evaluations of range conditions and trends, including watershed condition assessments and utilization studies.
3. Implementation. Livestock distribution practices are carried out by the permittee under the direction and review of the District Ranger. Direction is incorporated in the allotment management plan and the annual operating plan, which are integral parts of the grazing permit and provides current Forest Service instructions. The instructions reflect current allotment conditions and vegetative trends.

22.13 - Rangeland Improvements.

1. Objective. To improve, maintain or restore range resources, including soil and water through the use of rangeland improvements.
2. Explanation. Rangeland improvements are intended to enhance forage quality, quantity, and/or availability, and to provide protection to the other resources. Building fences to control the movement of livestock, improve watershed condition, and develop watering sites are just a few of the types of rangeland improvements implemented by the permittee or Forest Service as identified in the allotment plan. If a structure is causing soil erosion or water quality degradation the allotment plan will identify it and state corrective measures. Other measures may include stream channel stabilization efforts

such as riprapping, gully plugging, and planting; or mechanical treatments such as pitting, chiseling, or furrowing. Reseeding and/or fertilization may be done alone or in conjunction with any of these measures.

3. Implementation. The permittee is involved as a cooperator in rangeland improvements and may actually complete the work under Forest Service direction. Implementation may also be done by Forest Service crews or contractors. Range improvement needs are recognized in the range allotment planning process and are scheduled for implementation in the allotment plan and the 10-Year Forest Plan Implementation Schedule.

22.14 - Determining Grazing Capability of Lands.

1. Objective. To maintain or improve soil stability, soil productivity, and water quality by grazing the land within its capability.

2. Explanation. This practice is an administrative and preventative control. Soil condition classes, based on the relationship of current and natural soil loss tolerances, are used to determine grazing capability. Only land with soils in stable condition are considered as "full capability" range. Grazing capability ratings are then used in conjunction with other grazing considerations to determine the actual grazing capacity of an area.

3. Implementation. Soil condition class is determined by qualified soil scientists using Terrestrial Ecosystem Survey (TES). A range conservationist will use the soil condition class in determining the grazing capacity.

22.15 - Revegetation of Areas Disturbed by Grazing Activities.

1. Objective. To establish a vegetative cover on disturbed sites to prevent accelerated erosion and sedimentation.

2. Explanation. Where soil has been severely disturbed by past overgrazing and the establishment of vegetation is needed to minimize erosion, the appropriate measures shall be taken to establish an adequate cover of grass or other vegetation acceptable to the Forest Service and outlined in the allotment management plan. This measure is applied where it is expected that disturbed soils in parts of the area will require vegetative cover for stabilization and the problems will not be mitigated by other management plan provisions.

3. Implementation. Through the IRM process an estimate of the need is determined and included in the allotment plan. Where the ground cover is needed, objectives that will provide for vegetative establishment will be included in the allotment plan. The Forest Service shall identify on-the-ground disturbed areas that must be treated.

The Forest Service, shall provide instruction as to soil preparation and the application of suitable seed mixtures, mulch, and fertilizer, and the timing of such work. It is the responsibility of the District Ranger to make sure that revegetation work is done correctly and in a timely manner.

22.16 - Erosion Control Structure Maintenance.

1. Objective. To ensure that constructed erosion control structures are stabilized and working.
2. Explanation. Erosion control structures are only effective when they are in good repair and stable conditions. It is necessary to provide follow-up inspection and structural maintenance in order to avoid these problems and ensure adequate erosion control.
3. Implementation. During the period of grazing the permittee will implement and adhere to the Forest Service prescribed grazing protection measures.